MASARYKOVA UNIVERZITA

FAKULTA SOCIÁLNÍCH STUDIÍ

Perfectly Mismatched? Educational Assortative Mating in Online and Offline Dating: A Cross-National Perspective

Diplomová práce

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Katedra sociologie
Program Sociologie

Brno 2025

MUNI
FSS

Bibliografický záznam

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Název práce: Perfectly Mismatched? Educational Assortative Mating in Online and Offline Dating: A Cross-National Perspective

Studijní program: Sociologie

Vedoucí práce: prof. Martin Kreidl, Ph.D.

Rok: 2025

Počet stran: 90

Klíčová slova: výběrové párování, vzdělání, seznamování online, homogamie, hypogamie, hypergamie, partnerství

Bibliographic record

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Title of Thesis: Perfectly Mismatched? Educational Assortative Mating in Online and Offline Dating: A Cross-national Perspective

Degree Programme: Sociology

Supervisor: prof. Martin Kreidl, Ph.D.

Year: 2025

Number of Pages: 90

Keywords: assortative mating, education, online dating, homogamy, hypogamy, hypergamy, partnerships

Anotace

Ve své diplomové práci jsem pracovala s daty z Generations and Gender Survey ve třinácti zemích a regionech, abych zjistila, jak se liší off-line a online páry na základě vzdělanostního výběrového párování. K vysvětlení rozdílů napříč zeměmi jsem použila údaje o počtu vysoce vzdělaných lidí, genderové ideologii a stupni familialismu v populaci. Výsledky ukazují, že ve většině zemí jsou online páry vzdělanostně více heterogamní. To je způsobeno především tím, že se ženy párují s méně vzdělanými partnery. Charakteristiky specifické pro každou zemi nevysvětlily rozdíly napříč společnostmi.

Počet znaků s mezerami: 155 639

Abstract

In my thesis, I worked with data from the Generations and Gender Survey across thirteen countries and regions to find out how offline and online couples differ in educational assortative mating. In explaining differences across populations, country-specific characteristics such as the share of tertiary-educated individuals, gender ideology and degree of familism were included. Results show that in most countries, online couples are more educationally heterogamous, which is mostly caused by women partnering down. Country-specific characteristics did not explain differences across societies.

Declaration

Prohlašuji, že jsem diplomovou práci na téma **Perfectly Mismatched? Educational Assortative Mating in Online and Offline Dating: A Cross-National Perspective** zpracovala sama**.** Veškeré prameny a zdroje informací, které jsem použila k sepsání této práce, byly citovány v textu a jsou uvedeny v seznamu použitých pramenů a literatury.

Brno May 7, 2025

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Adéla Pospíšilová

Acknowledgements

Předně bych chtěla poděkovat svému vedoucímu prof. Martinu Kreidlovi, Ph.D., který si na mě dokázal vždycky udělat čas a bez jehož rad a podnětů by diplomová práce nikdy nenabyla své dnešní podoby. Moc si vážím upřímných povzbuzení, která mě na konci našich konzultací vždycky naplnila chutí dál analyzovat a v práci pokračovat. Děkuji také své rodině a přátelům, kteří během posledních pár měsíců snášeli mé kolísavé nálady, které jsem doplňovala nekonečným mluvením o strastech a radostech akademického psaní. V neposlední řadě chci poděkovat Vojtěchovi. Děkuju ti, že to všechno se mnou prožíváš a za všech možných okolností mě dokážeš vyslechnout a podpořit.

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Glossary

STT	–	structural transition theory
SCT	–	status closure theory
GGS	–	Generations and Gender Survey
OECD	–	Organisation for Economic Co-operation and Development
C&SD	–	The Census and Statistics Department (Hong Kong)
EVS	–	European Value Study
WVS	–	World Value Study

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Appendix A Supplementary Material **Chyba! Záložka není definována.**

Others

1 Introduction

When a rich bachelor Mr. Bingley arrives in Hertfordshire with his close friend, Mr. Darcy, who happens to be even wealthier than Mr. Bingley, Mrs. Bennet cannot wait to introduce her five daughters to the new prospective husbands in town. Mrs. Bennet famously notes: "It is a truth universally acknowledged, that a single man in possession of a good fortune, must be in want of a wife," (Austen 2008:5). And what better place to meet new potential partners in 1800s England than at a joyful ball? That is, until Elizabeth, the second eldest Bennet daughter, first encounters Mr. Darcy. She thinks of him as a *proud* and arrogant nobleman. He despises Elizabeth for her social inferiority and ill-mannered family, and declines to dance with her because she lacks beauty in his eyes. Both protagonists differ in their societal position, and many characters around them find their match inappropriate. However, in this game of rank and status, with their every encounter, Mr. Darcy finds himself drawn to Elizabeth thanks to her wit and straightforwardness. Elizabeth similarly grows fond of Mr. Darcy despite her initial *prejudice*. The main characters end up creating a love match sealed by a marriage proposal despite the prevailing social norm of marrying someone of equal status.

Pride and Prejudice still resonates with people over 200 years later. With its many film adaptations and theatre reenactments, Jane Austen is indeed a pioneer in writing a compelling romance novel. The idea of lovers with different backgrounds who fall head over heels for each other seems to be a theme that pop culture has not had enough of and is still infatuated with. The 2025 Oscar's Best Picture winner, Anora, is a spin-off of the 1990 movie Pretty Woman, in which two protagonists, separated by their social status, find their way towards each other. Seemingly, pop culture loves to fantasise about what social scientists call partner heterogamy, which is a union that entails partners who are dissimilar in one or more characteristics (Lichter, Qian 2019; Qian, Hu 2024). However, in the real world, intimate partners who are alike dominate the mating market (Blossfeld 2009). The way people choose their partners indicates a society's social openness, and high rates of homogamy, similarity of partners, signify higher social boundaries (Lichter, Qian 2019). In fact, choosing a partner is highly limited by meeting opportunities and as Katrňák (2008:238) notes: "Love that transcends these social barriers seems to exist only in fairy tales."

According to Blau et al. (1984), the way we make decisions, even in the dating world, is influenced by the environment and its structure. This means that the place where we meet our potential intimate partners impacts partnership formation. In particular, the place has an impact on how similar we and our partners are and what characteristics we share (Blau, Schwartz 1997). Our family and friends were the essential intermediaries of meeting new people, perhaps since the beginning of time (Rosenfeld et al. 2019). In order to find an intimate partner, an individual was therefore dependent on family and friends, as well as on formal institutions they were part of, such as

work, school, or religious groups (Qian, Hu 2024). Being part of such homogenised groups means that the people we meet usually share the same sociodemographic attributes such as race, age and education. Spending a lot of time in places with people who resemble us limits our ability to connect with those who are not the same as us (Schwartz 2013; Qian, Hu 2024). Such a structural closeness has an impact on wealth inequalities in the society, which are especially linked to educational attainment (Blossfeld, Buchholz 2009). Nevertheless, with the advent of the internet, traditional ways people meet their partners have been declining (Rosenfeld et al. 2019), and people are now, through various dating apps and online venues, able to start new relationships with strangers without social ties (Rosenfeld, Thomas 2012; Rosenfeld et al. 2019). However, social scientists have not reached a consensus on how the internet affects matchmaking in terms of educational assortative mating. Two approaches have emerged in the academic literature. The first group of researchers assumes, that thanks to the many filters, which allow users to sort their "matches" on dating apps, educational homogamy will be strengthened (Skopek et al. 2011). Nevertheless, the other approach suggests the internet diversifies the pool of potential mates, allowing users to meet people with different sociodemographic traits. Hence, the internet is weakening educational homogamy (Potarca 2017; 2020; Thomas 2020).

If the latter approach is true, is the internet a democratising tool which has the potential to erase inequalities and make a fantasy of two people from different worlds falling in love come true? And to whom does this fantasy even belong? In the following thesis, I investigate whether online and offline couples differ when it comes to educational assortative mating. Previous studies show inconsistent results about the power of the internet on social inequalities imposed by educational assortative mating, and they are lacking in their absence of a cross-national approach. Therefore, I decided to explore educational assortative mating in online and offline couples across thirteen countries and territories. I assume that the effect of the internet will not be equally strong in all populations, and characteristics unique to each country and region will influence whether the internet reinforces or weakens educational homogamy, hypogamy and hypergamy in partnerships. The cross-national approach provides a deeper understanding of the online dating mechanism, which might be influenced by several contextual factors. In my thesis, I investigate the influence of a number of tertiary-educated individuals, gender ideology and degree of familialism in the population on educational assortative mating online.

My goal is to find out the way online couples differ from couples who did not meet via the internet on the grounds of educational homogamy, hypogamy and hypergamy and what role the population's properties play in matchmaking on the internet. To conduct my binary and multinomial logistic regression analyses, I used data from thirteen countries and regions, that participated in the 2nd round of the Generations and Gender Survey (Generations and Gender Programme 2019).

2 Theoretical background

2.1 Assortative Mating

2.1.1 The Mechanism of Assortative Mating

In Jane Austen's *Pride and Prejudice*, Mr. Darcy undergoes a metamorphosis from a nobleman who seeks a wife of the same class and rank to a man who simply cannot resist his attraction to Elizabeth. Since Elizabeth is from a much humbler family, Mr. Darcy decides to "marry down" out of love. The main protagonists might be different in their social status, but Mr. Darcy starts to see through the titles and recognise Elizabeth for the woman she is: a woman of intelligence and wit, traits that they both share. Today's social scientists would call this 1800s match heterogamous, a pairing of people from different social groups, which is usually put in contrast to homogamy. The concept of homogamy is often used interchangeably with the term assortative mating, which is in this context understood as the tendency to partner with someone of a similar characteristic. Nevertheless, assortative mating in general "may refer to any non-random mixing of spousal characteristics," (Xie et al. 2015:5974). Hence, the concept of assortative mating can occur as heterogamy, a partnership with someone outside one's group, someone dissimilar, and also as homogamy, a union between individuals with similar characteristics (Lichter, Qian 2019). Becker (1993) borrows terminology from biology and refers to same likes same as positive assortative mating, whereas the mating of different partners is considered negative assortative mating[1]. Previous evidence shows that all kinds of intimate relationships disproportionately consist of individuals "who share similar ascribed (e.g., race and age) and achieved characteristics (e.g., education or social background)," (Lichter, Qian 2019:303).

According to Becker's (1973) economic approach, positive assortative mating could be the result of two processes: matching and competition. According to sociologists, positive assortative mating could be caused by a preference for a partner with similar traits, such as tastes, values, interests and lifestyles, therefore by cultural matching (Torche 2010; Xie et al. 2015). While sociologists emphasise the role of matching, economists focus on the competition. They stress that competition could lead to a preference for partners with more resources. According to such a mechanism, individuals pick partners with similar traits because they are complementary in

[1] In my thesis, I use homogamy and positive assortative mating interchangeably, as a pairing of partners who are similar in one aspect. Heterogamy and negative assortative mating indicate couples with people who differ in a certain trait. Assortative mating is used as a non-random pairing of individuals, it does not indicate similarity or dissimilarity.

producing household goods and improved family welfare (Becker 1973; Xie et al. 2015). In both cases, partner-seeking individuals are actively choosing their mate, but constrained by the pool of potential partners they have access to (Lersch, Schunck 2023).

These steps to partnership formation are summed up by the partner search theory (Oppenheimer 1988). The process of finding an intimate partner is dependent on three factors: each person's mate preference, the availability of people with such desired preferences and the way people look for potential partners, which can affect meeting opportunities. In the end, both sides need to come to an agreement on whether they are each other's "desired candidate" (Van Bavel 2021). Nevertheless, multiple studies (Hitsch et al. 2010; Skopek et al. 2011; Xie et al. 2015) stress that if people are segregated into social contexts based on similar characteristics, homogamy still occurs. People might not have preferences for similar attributes but still choose homogamy, because they are not exposed to potential partners with dissimilar, preferred traits. Such a belief is summarised by Blau et al. (1984) who assume that the way we make decisions, even in the dating world, is influenced by the environment and its structure. This means that the place where we meet our potential intimate partners impacts partnership formation. In particular, the place has an impact on how similar we and our partners are and what characteristics we share (Blau, Schwartz 1997).

One of the many ways a person can meet a partner is through formal institutions such as school, workplace or social groups (Qian, Hu 2024). While the function of these institutions is not primarily the mediation of matchmaking, they provide opportunities for meeting similar people (McClendon et al. 2014). Such homogenised environments also limit meeting dissimilar (Qian, Hu 2024). Each institution also varies in size and exhibits different levels of socio-demographic segregation, resulting in a restricted pool of potential partners (Potarca 2020). It can be argued that family and friends, i.e. social ties, also play a huge role in matchmaking. Most likely since the beginning of time, our closest ones have been the primary intermediaries of matchmaking. However, individuals meeting the "traditional" way may have a lower autonomy over their choice of partner due to the necessity of such "mediators." These intermediaries are family members and friends who function as the middle piece; they decide who they introduce to whom (Rosenfeld et al. 2019). The individual still has a choice, but their pool of potential partners is limited by the decision made by a trusted family member or a friend. In conclusion, the choice of a potential partner is not only influenced by personal preferences but also by the meeting opportunities. Ways of meeting an intimate partner are constrained by institutions (school, workplace, social groups) and by informal agents such as family members and friends, who might intermediate

connections based on their standard of a person they approve of (Lichter, Qian 2019; Rosenfeld et al. 2019; Sharabi, Dorrance-Hall 2024).

2.1.2 Social Inequalities Imposed by Assortative Mating

Since individuals' tendency for choosing a similar partner is imposed by homogenised environments, research on assortative mating is particularly important because it provides a measure of social openness (Lichter et al. 2015). Homogamous relationships showcase greater closure with their unwillingness to pair with dissimilar partners. In contrast, intermarriages and heterogamous unions exhibit greater openness to all kinds of potential partners and therefore, their social distance is not as important to them. That is why assortative mating has the ability to expose social and cultural boundaries, hence playing a significant role in the research of stratification and inequality (Lichter, Qian 2019).

The link between social inequality and assortative mating emerges during the process of household formation in which wealth is shared. Choosing an intimate partner means that we are creating a household to which we are bringing our resources. Conversely, we can gain resources from entering said household, which plays a role in potential social mobility (Breen, Salazar 2011; Schwartz 2013). A rigid society with high rates of homogamy showcases increased inequality between households and a high concentration of wealth in one group of individuals, in contrast to a society with heterogamous unions, indicating a possibility for social mobility and more equal distribution of wealth (Torche 2010; Monaghan 2015).

That is why the role of educational attainment has been at the forefront of assortative mating research in recent years (Lichter, Qian 2019). The boundaries between social groups with different educational attainment have been becoming stronger and are even surpassing or complicating older barriers such as racial and social class differences (Monaghan 2015). Education remains one of the main determinants of occupational success (Skopek et al. 2011), and an increase in returns to education has been apparent (Eika et al. 2019). Educational attainment has an impact on many desirable outcomes, ranging from better health, overall happiness to higher economic capital (Hout 2012). Education represents one of the main attributes considered in a search for a mate (Buss et al., 1990), since someone's educational level is not only beneficial for the individual, but also for their partner (Lefgren, McIntyre 2006). That is why a pairing of similarly educated partners impacts the chance of intergenerational social mobility through the concentration of multiple resources connected to high levels of educational attainment (Katrňák et al. 2012).

2.1.3 Trends in Educational Assortative Mating

In recent decades, we have been witnesses to educational expansion, especially on the grounds of higher education. Such a trend has been apparent in all Western industrialised countries; nonetheless, in some regions the pace of educational expansion differs (Blossfeld et al. 2015). While men were dominating the educational system beyond the primary level in the past, women have been catching up with them and even taking the lead, especially in higher education. The so-called reversed educational gender gap has been growing in several countries (Grow, Van Bavel 2015; Esteve et al. 2016; Van Bavel et al. 2018). With school being a traditional channel through which people often meet, educational expansion offers a growing chance of meeting a potential intimate partner with the same educational attainment. Additionally, it gives individuals an opportunity to meet future spouses at the age of typical partnership formation (Blossfeld, Buchholz 2009). Based on this assumption, Blossfeld and Buchholz (2009:604) note with reference to Mare (1991):

> „Educational expansion could therefore quite unintentionally from its original political and societal goal to provide more equal educational opportunities, increase the likelihood of educational homogamy across cohorts and, as a consequence, not only reinforce social inequality among married couples from one birth cohort to the next, but also lead to a growing divergence of social opportunities for the next generation of children."

However, recent studies show that the reversal of the gender gap in education has resulted in a decrease in hypergamy and an increase in hypogamy (Van Bavel et al. 2018; Erát 2021). What does it mean? Most studies define educational hypergamy as a union in which the man is more educated than the woman, whereas hypogamy is understood as a couple with a more educated woman and a less educated man (Esteve et al., 2016; Van Bavel et al. 2018). In younger cohorts, educationally heterogamous relationships more often consist of more educated wives (Esteve et al. 2012). A study of 28 European countries by De Hauw et al. (2017) suggests that hypogamy is now the second most common form of educational union formation, surpassing hypergamy. Van Bavel et al. (2018:346) note that "substantial portions of populations in which RGE

(reversal of the gender gap in education[2]) has occurred are forming partnerships in which wives have more education than their husbands rather than remaining single." It can therefore be argued that the shift in educational assortative mating is not caused by a sudden change in mate preferences but by the available pool of potential partners (Xie et al. 2015; Van Bavel et al. 2018; Erát 2021). The structural changes are most likely caused by women's improved educational attainment and socioeconomic status (Han 2022), which leads to a decrease of cases in which women pair upwards (Esteve et al. 2012)

To sum up, in recent decades, due to the reverse gender gap in education and increase in the average level of women's education, the number of couples with more educated men is declining while educationally hypogamous relationships are on the rise (Esteve et al., 2012). A study on educational assortative mating in 28 European countries by De Hauw et al. (2017) revealed that as the educational gender gap grows, women start partnering down more often. Even though educational homogamy remains the dominant union constellation, "the emergence of educational hypogamy as the second most prominent relationship type in Europe is supported by several country-specific studies," (Erát 2021:163). These studies, mentioned by Erát (2021), are by Correia (2003) from Portugal, Esteve and Cortina (2006) from Spain, Katrňák (2008) from the Czech Republic, Slovakia and Hungary, Dribe and Nystedt (2013) from Sweden, Krzyźanowska and Mascie-Taylor (2014) from Great Britain and Mäenpää (2015) from Finland.

2.1.4 Country-Specific Influences on Educational Assortative Mating

In a number of European countries, ideals on what roles are ascribed to men and women differ (Grunow et al. 2018). In academic literature, a variety of phrases are used to describe "individuals' levels of support for a division of paid work and family responsibilities that is based on the notion of separate spheres" (Davis Greenstein 2009:88) such as gender ideology, gender role attitudes, attitudes about gender, gender-related attitudes, gender egalitarianism, gender traditionalism and others (Davis, Greenstein 2009). In my thesis, I will refer to such constructions of meaning as gender ideology. Egalitarian gender ideologies emphasise the shared responsibility and ability of both men and women to contribute to earnings and caring. Whereas, in countries with traditional gender ideologies, it is believed that such activities are gendered and

[2] Author's note.

part of separate spheres (Davis, Greenstein 2009). Hence, hypogamous partnerships can be more prone to dissolution in traditional gender role societies due to the stigma around them (Tichenor 2005). In societies where men as the breadwinners and women as the homemakers are the norm, individuals prefer a mate with characteristics that enhance such a division of labour between partners (Becker, 1993). Therefore, men might go for younger and less educated women, whereas women want to pair with older men who are highly educated and thus are most likely to make more money (Buss, 2000). However, there has been a shift towards higher gender equality in a number of societies, which means that even what individuals look for in a partner is likely to change (Goldscheider et al. 2009). Since the 1990s, men care more about the earnings potential of their female partners, while women, on the other hand, place less importance on how much their male partners make (Zentner, Eagly 2015). With a higher share of tertiary-educated women entering the mating market (Grow, Van Bavel 2015) and hypogamous relationships being more common and therefore more accepted (Theunis et al. 2018), some researchers argue that women's educational advantage has a positive effect on strengthening gender role egalitarianism in such societies (Goldscheider et al. 2015; Esteve et al. 2016). Nevertheless, others argue that the gender revolution is mainly fuelled by women and is therefore asymmetric and stalled (England 2010), which is notable in some countries, such as the Czech Republic, Spain, or Switzerland, where a gender ideology model of egalitarian essentialism is present. Such a gender ideology combines egalitarian ideas about both men and women participating in paid labour alongside traditional women's self-fulfilment as homemakers (Grunow et al., 2018).

However, in terms of family values, many Westernised countries have undergone complex transformations. There has been a decreasing desire to marry and have children (Sassler, Lichter 2020). When combined with high divorce rates, which have been apparent in many countries (Härkönen 2014), singledom and delayed union formation have increased due to stronger expectations of getting divorced (Arocho 2019). This goes hand in hand with the current phenomenon of young people leaving their parental home later in life. Such a trend has been notable in a number of countries all around the world. Many young people explain their decision to stay under one roof with their parents by a lack of savings, housing or the desire to find a partner. Often, such a decision to "nest" is made due to the influence of the individual's parent (Sompolska-Rzechuła, Kurdyś-Kujawska 2022). Young people's perceptions of the housing market also contribute to delayed home-leaving (Billari, Liefbroer 2007).

These family influences vary across countries. A country can be characterised by weak family systems, which are represented by weaker intergenerational ties and independence of an individual, often called *individualistic* countries. Conversely,

countries with strong family systems are referred to as *familialistic* countries. Most often, there is a distinction between the European north, which is associated with early home leaving and the European south, where family ties are strong and children leave their nests late (Reher 1998). A study by Daatland et al. (2011) hints at a division between east and west, too, with eastern countries displaying stronger family norms than in the west. This notion of autonomy in weak family systems is in line with the recent decrease in fertility and increase in cohabitation and divorce rates (Van den Berg et al. 2021). Additionally, individualistic countries tend to be more tolerant towards divorce, but divorcees might lack support due to the weak family system. On the other hand, familialistic societies are not keen on divorce, but they offer greater support, and the negative effects of marriage dissolution are not as strong on the individual (Kalmijn 2010). Such trends in populations to leave home later and postpone the partner search have potential implications for educational assortative mating, although such a connection is not explored to a great extent. Nevertheless, once youths decide to leave their nests, it is usually linked to other life events marking adulthood, such as entering the labour market, finding a partner or enrolling in higher education (Sompolska-Rzechuła, Kurdyś-Kujawska 2022)

The number of tertiary-educated people in the population also influences assortative mating (Hu, Qian 2016). There are two contradictory approaches to explaining the effect of educational expansion on assortative mating. According to the structural transition theory (STT) higher education expansion represents an enlargement of the pool of highly-educated potential partners. Therefore, educational homogamy is promoted because more highly educated individuals meet on college grounds (Blossfeld, Tim 2003). Additionally, in contrast to less educated individuals, highly educated people reach marriageable ages in college and have a smaller time window for getting married. If there are more people with higher education in the country, they will be more likely to strengthen educational assortative mating (Hu, Qian 2016). On the other hand, the approach of status closure theory (SCT) assumes that mate selection represents a measure of social openness. Education is therefore a sign of status and an individual's educational assortative mating shows status closure in a society (Goldthorpe 1980). Smits (2003) argues that educational status closure is influenced by the size of the education elite. When the elite is small, the members want to keep their resources and privileges and therefore, marry each other, strengthening educational homogamy (Hu, Qian 2016).

In conclusion, through the partner search theory (Oppenheimer 1988), matchmaking is based on preferences, availability of people with such desires and the opportunities a person has to meet such a desired partner. Educational attainment preferences in a partner are subject to change, potentially due to the change of structural

disposition of highly educated individuals (Van Bavel et al. 2018). And even meeting opportunities have undergone a transformation. The advent of the internet has brought a new world of different opportunities, which has affected the partner search too. Have our closest friends and family members been replaced by the seemingly opinion-less and non-judgmental dating app algorithms? Has the internet blurred the social boundaries which often segregated the less educated from the more educated?

2.2 The Nature of Online Dating

In 2012, a revolutionary feature emerged in the dating world. Instead of dating sites and their long and complicated profile creation, which could sometimes feel like filling out a job form, people could easily open their smartphones and start matching with anyone, at any given moment, anywhere in the world (David, Cambre 2016). In 2012, Tinder, the most downloaded dating app in the world today (Dixon 2025), introduced the swiping mechanism, later adopted by several dating app competitors and known by every experienced online dater. Users have been able to set up their dating profile in a couple of minutes with just a few pictures and basic information in the form of a card stack and start swiping, left signalling refusal and right interest (Broeker, Spector 2024).

The internet has always had a distinct ability to connect two people geographically distant from each other, or at least people who would have never met in the outside world. Nevertheless, dating apps made the mysterious stranger behind the screen far less uncertain and unapproachable and offered their users information about their potential partner's appearance, education or age in a matter of seconds. Rosenfeld and Thomas (2012) showed that 74 % of couples formed online were perfect strangers in the US. Also in the US, the internet has become the most common venue for matchmaking, displacing friends and family for the first time in 2013 and as Rosenfeld et al. (2019:17753) note: "the rise of the Internet has allowed individuals in the dating market to disintermediate their friends, i.e., to meet romantic partners without the personal intermediation of their friends and family."

The internet has often been considered a democratising tool. There is an abundance of knowledge on the internet, which can be accessed by wider groups of individuals, instead of all this information being intended for the elites only. If we consider the internet as a tool of democracy, such a belief could be translated into online dating, too. People suddenly have access to a broad pool of potential partners. Moreover, online daters have the option to make an autonomous choice about their potential future spouse without any "mediator" in the middle. Love is no longer dependent on social and economic institutions only (Bergström 2022). Making the right choice is

therefore up to the individual, and social norms are no longer as much of a help in navigating our love life (Thwaites 2020). But with the autonomy of partner choice the internet offers, do people choose a partner with a similar background, or do they opt for someone they would hardly find in the outside world?

Social scientists are torn, with a number of studies supporting the assumption that meeting online is associated with couple diversity (Potarca 2020; Thomas 2020). On the other hand, a contradictory approach in the academic literature suggests that the internet only reinforces a couple's homogamy (Curington et al. 2021; Cai, Qian 2023). However, these studies talk primarily about racial and nativity homogamy. Since dating apps offer many filtering and sorting algorithms, the latter group of authors assumes users can choose a partner based on certain characteristics such as education, age, race and other qualities (Skopek et al., 2011). In 2023, over 75 million active users used Tinder (Iqbal 2024), which allows people to showcase information about their education, location or age. However, they can only filter their "matches" through location, age or gender. Most dating apps have abandoned algorithms, which chose suitable partners using preference questionnaires (Sharabi 2022). Instead, many dating apps operate on the "best match" mechanism, which gathers user's trace data, "swiping" behaviour, and offers them potential partners (Comunello, et al. 2021, Krzywicki et al. 2015). It is possible that dating apps use collaborative filtering algorithms, which are usually adapted by big companies such as Amazon and Google. Such algorithms take into account past behaviour of similar users and predict the preferences of new users. Such an algorithm creates recommendations and creates options that the user has access to (Nader 2021). Precisely because of the dating apps' nature, which has the ability to group potential partners by categories, meeting online is believed to reproduce pre-existing social structures, which can lead to homogamous matching patterns (Curington et al. 2021; Cai, Qian 2023).

Alternatively, it is assumed that internet users might not feel as pressured to choose a partner with similar socio-economic characteristics with the diminishment of the influence of institutions and pre-existing social ties. Online users would not be constrained by institutions and structural opportunities or the intermediation of their close family members and friends (Rosenfeld, Thomas 2012; Rosenfeld et al. 2019; Potarca 2020). Therefore, access to a vast pool of potential partners online without outside influences and the superficial nature of most dating apps (showcasing primarily photos of users and very surface information) could attract users to people who are not similar to them, thus creating socio-economically diverse unions among people with different life backgrounds.

2.3 Educational Assortative Mating Online

The answer to educational assortative mating online is not so straightforward. The ambiguity of results is partially because of the variety of methods one can use to research educational homogamy online. A large body of literature (Skopek et al. 2011; Whyte, Torgler 2017) uses unique datasets from actual dating sites to study the interactions and the "real-life" process of match-making. This approach is extraordinary due to its unbiased way of processing data. Digital trace data represent a non-reactive measure which is not distorted by the researcher. Since there is no observer, the match-making behaviour is not endangered by the social desirability bias. Furthermore, due to the ability to reconstruct interactions ex-post, research subjects, i.e. online daters are not prone to reporting or recall bias, which can be common in surveys and questionnaires. In terms of the observers, the absence of researchers in the collection of software-driven data also provides a dataset without observer biases (Skopek 2023). Since trace data offers an objective observation of initial contact, online daters' actual preferences can be studied, instead of stated preferences in surveys and interviews.

According to Skopek et al. (2011:192), who were using German data from an online dating site, "social structures and normative rules of mate selection from everyday life continue to affect people's choices even in such an open setting (the internet." Their results showed that educational homogamy prevails online. „A similar educational level not only encourages initial contacts, but also supports the formation of relationships," (Skopek et al. 2011:192). A desire for a similar partner was the same for both men and women. Nonetheless, educational homogamy was strengthened with the growing level of education. This trend was present for men and women; however, it was stronger for women. Similar findings were present in the study by Whyte and Torgler (2017), who used Australian trace data from an online dating website RSVP. According to the researchers, „highly educated online daters are more likely to contact others with the same educational level," (Whyte, Torgler 2017:9). They add another dimension to their analysis: age. Younger, more educated cohorts were more likely to seek homogamy, whereas older dating website users' education is not as important for their homogamy preferences. In terms of gender, younger men are more likely than younger women to contact a less educated individual. Nevertheless, this gender difference seems to disappear with age (at approximately 50 years of age): older women are more likely to initiate contact with lower-educated men.

Another emerging group of trace data studies use correspondence experiments. This method has been used primarily in the context of the labour market to detect discriminatory preferences (Bertrand, Mullainathan 2004), from racial to previous working experience discrimination. In terms of dating markets, researchers usually create

fake dating profiles with controlled characteristics, and they study the initial contacts and interactions of these fake daters. Egebark et al. (2021) conducted their experiment with 12 fictitious dating profiles on one of the larger dating sites in the Netherlands. They primarily focused on education and attractiveness preferences. Their results suggest that both men and women value attractiveness in the same way. However, when it comes to education, „high-educated men prefer low-educated profiles over high-educated profiles as much as high-educated women prefer high-educated profiles over low-educated profiles," (Egebark et al. 2021:12). Similarly, Neyt et al. (2019) entered the biggest swiping-based dating app Tinder with 24 fictitious profiles in multiple cities in Flanders, Belgium. The results show gender differences once again. Education level mattered only substantially when women evaluated men's profiles. Nonetheless, the researchers state that mate preferences were not driven by educational homogamy.

In conclusion, the pitfall of studying interactions between online daters is that it tells us very little about the couples and their duration "post-internet"; in fact, online interactions tell us nothing about whether the pair ended up in a serious relationship. From the match-making process online, we can only see the early stages of relationship formation and probable preferences of users by inspecting who contacts whom (Skopek 2023).

Table 1: Overview of studies focusing on educational assortative mating online.

authors	year	methodology	country	results
Dutton et al.	2009	survey data	Australia, UK, Spain	heterogamy
Skopek et al.	2011	online interactions	Germany	homogamy
Whyte, Torgler	2017	online interactions	Australia	homogamy among highly educated
Potarca	2017	survey data	US, Germany	heterogamy
Neyt et al.	2019	correspondence experiment	Belgium - Flanders	heterogamy
Potarca	2020	survey data	Switzerland	heterogamy
Thomas	2020	survey data	US	heterogamy
Egebark et al.	2021	correspondence experiment	the Netherlands	homogamy among highly educated women
Qian, Hu	2024	survey data	Canada	heterogamy

The nature of actual partnerships and "what happens beyond the internet" is often studied through survey data. A large body of empirical research uses census or survey

data of established marriages and unions. These studies look at the other end of the dating process and, in contrast to contact initiation, they study the probable "finish line." Furthermore, survey data is not burdened by the problem of representativeness. Census and survey data have clearly specified populations, which is an advantage in comparison to trace data. In addition, with survey data, we clearly know that we are researching cohabitating couples or marriages, on online dating apps, users' motivations to initiate contact are unclear, and we cannot always assume online daters primarily look for a serious partner (Skopek 2023).

Perhaps that is the reason, survey data represents the lion's share of partnership and marriage studies. Potarca in 2017 studied (not only) educational assortative mating online in two countries: the US and Germany. She found differences in educational assortative mating between online and offline couples in both countries: online couples displayed weaker educational homogamy. In her newer study (2020) Potarca explored the educational assortative mating and family values of dating users in Switzerland. The Swiss internet-formed couples were more educationally heterogamous (i.e. one partner with tertiary education and one with non-tertiary education) than couples who met offline. „The effect is largely driven by tertiary-educated women partnering down," (Potarca 2020:12).

She adds that online couples do not differ from offline couples in intentions to marry, however, they may prioritise cohabitation first. However, Rosenfeld (2017) on the matter of marriage points out that online couples were associated with faster transitions to marriage, and he notes that the most marriage-ready singles were drawn to cyber-dating. Singles on dating apps were similar to singles seeking a partner offline in family values too. Potarca (2020) shows that women online displayed increased desire to have a child in the near future and notes that highly educated women in Switzerland who postpone marriage and focus on professional careers first might especially benefit from using dating apps. This is noted by Sprecher (2009), who mentions that those who lack time and access are unsuccessful in seeking partners in traditional venues and therefore opt for online dating.

Online educational heterogamy was also found by Dutton et al. (2009), who studied married couples in Australia, Spain and the UK. According to the study, the couples formed online are presented with more diversity in the dating market, which resulted in different educational backgrounds of partners. Nevertheless, both couples online and offline were fairly similar in their interests, hinting at the possible implication that online users valued similarity in interests more than socioeconomic status (Dutton et al. 2009). Thomas (2020) on data from the US showed that couples formed online are more likely to be different in college degree status, meaning one partner has a college degree and the other does not. These results are in line with Potarca's (2020)

findings, who similarly differentiated between tertiary-educated and non-tertiary-educated. Lastly, one of the newest studies (2024) was conducted by Qian and Hu in Canada. Their results show that couples who met online are more associated with educational heterogamy. Nonetheless, the findings offer a more complex picture. Compared with online dating, educational homogamy is reinforced primarily by institutional settings and couples' matching cultural tastes rather than through third-person intervention. In terms of gender asymmetry, online daters are more prone to educational hypergamy (couples with more educated men and less educated women).

To conclude, both methods, trace and survey data, offer different nuances of understanding preferences and the actual enactment of educational assortative mating. Ideally, research of the first contact of a couple online and a later follow-up of their relationship formation in the real world would be desired. There is one exception by Lee (2016) who, although did not use digital trace data, instead worked with follow-up data of married couples who met on a Korean dating site. Nevertheless, what most of the previously mentioned studies exploring educational assortative mating online have in common is their focus on a single country only. Therefore, a cross-national approach to online dating is necessary for searching for a contextual understanding. There are a few exceptions from the already mentioned Dutton et al. (2009) and Potarca (2017). One study by Potarca and Mills (2015) studied racial preferences in online dating in nine European countries, with online daters preferring same-race partners. Additionally, European countries are not usually represented in the research, which is mostly conducted in the United States. As Skopek (2023:32) notes: "despite the presence of internationally operating online dating companies, there is nearly no cross-national research that would compare dating behaviour in various cultural and societal contexts, apart from the *eDarling* study by Potarca and Mills (2015)." The abundance of cross-national approaches to assortative mating in online dating calls for a return to the topic.

3 Methodology

3.1 Research Questions and Hypotheses

The internet offers an abundance of knowledge, opportunities and entertainment. One might naturally believe something better is around the corner, or more precisely, in the next click. The same abundance of options could be behind the practice of swiping right on dating apps. All of these options have faces, ages, hobbies and educational degrees. This surface information is most of the time immediately available online, in contrast to meeting a potential partner out in the open. Does it matter?

In my analysis, I want to focus on partner pairing based on educational attainment, since education remains one of the most significant ways to categorise someone's occupational success (Skopek et al. 2011) and is at the forefront of barriers separating social groups (Monaghan, 2015). Therefore, I pose my main research question: **Do couples who met online differ from those who met offline in terms of educational assortative mating? And if so, how?** As mentioned above, prior research on assortative mating online has not reached a consensus on whether people on the internet are more likely to choose educationally different potential partners, i.e. engaging in educational heterogamy (Potarca 2017; Thomas, 2020), due to the abundance of choices, or whether they prefer someone very similar, who checks all of their boxes, i.e. engaging in educational homogamy (Skopek et al. 2011; Whyte, Torgler 2017), because of the filtering mechanisms available on dating apps and websites. Since educational homogamy was only shown in studies which used trace data and correspondence experiments of initial interactions, I assume that in real life, couples who met via the internet, educational heterogamy prevails, in line with survey data studies. Therefore, I am joining the first group of researchers and state my first hypothesis:

> *H1: Meeting online will cause weaker educational homogamy than meeting offline[3].*

Furthermore, there has been a lack of studies, with some exceptions (Potarca 2020; Qian, Hu 2024), differentiating between hypogamy and hypergamy in online dating. Are there more hypogamous or hypergamous relationships online compared to offline? Skopek et al. (2011) found that the desire for a similar partner was consistent

[3] Meeting offline is a term used in many research papers to describe instances where couples met through social ties, such as family members and friends, formal institutions like schools or workplaces, or randomly in the „outside world" In a recent study by Qian and Hu (2024), respondents were categorized as offline if they selected any option other than meeting via the internet.

for both men and women. Nevertheless, according to Hitsch et al. (2006), it is primarily women online who seek men with similar educational backgrounds. Highly educated men had no issue contacting women with lower education than themselves (Hitsch et al. 2006). However, it is noteworthy that women online are in greater demand since men on dating sites outnumber them (Šetinová, Topinková 2021). It is the women who hold the power over whom they are going to contact or reply. Therefore, I assume that with online dating, which offers its users access to more potential partners with different educational levels, hypogamy, a rising form of mate union, will be more easily achievable online than offline. I am putting forward another hypothesis:

> *H2: Meeting online will lead to a stronger educational hypogamy than if the couple met offline.*

Based on my assumptions regarding individual-level hypotheses, I also form my country-level hypotheses. I investigate whether country/region-specific variables such as the **share of highly educated individuals**, the prevailing **gender ideology** and the **share of young adults living with their parents** in populations are associated with educational assortative mating online. **Do population-specific variables influence educational homogamy and hypogamy in online couples compared to offline couples?** Based on the first hypothesis, I think that in countries with more tertiary-educated individuals, online dating providing access to educationally diverse users will reinforce educational heterogamy. According to the structural transition theory (STT), educational homogamy is caused by a large number of people meeting on the grounds of universities at the marriageable age (Hu, Qian 2016). However, I think that with the extension of the internet, such tertiary-educated individuals will not be limited to finding their partners only at school. It is noteworthy that educational expansion has been reinforced by more women entering higher education (Esteve et al. 2016), therefore, I believe that in more tertiary-educated countries, the higher education rates will be mainly caused by women with university degrees. Since women, due to the structural distribution, will not be as likely to meet similarly educated partners, they might try to find a spouse online. I postulate the following hypotheses:

H3: A higher share of people with a tertiary[4] education will lead to a larger difference in educational homogamy between couples who met online and couples who met offline.

H4: A higher share of people with a tertiary education will lead to a larger difference in educational hypogamy between couples that met online and couples that met offline.

Secondly, I assume that the gender ideology of certain countries will also influence the characteristics ideal in a mate and potentially set the mating market disposition in a society. I assume that education in more traditional gender role countries will be valued, and highly educated individuals will pair with each other, causing educational homogamy among these people. Nevertheless, in countries where gender role ideology is more egalitarian, such attitudes will not be strictly tied to higher education, and people will be open to pair with educationally different partners. Nonetheless, I can argue that in countries with more traditional gender-role ideology, educational heterogamy will prevail too. I can expect that women will go for a more educated partner with the hope of being more financially stable; men, on the other hand, will prefer a less educated woman who is fulfilled by her role as a homemaker (Buss 2000). Because of my reasoning about men as breadwinners and women as homemakers in traditional gender-role countries, I also suspect that the rate of hypogamous unions in such countries and regions will be low, since hypogamy can carry a negative connotation (Tichenor 2005). Similarly, in countries with more egalitarian gender-role ideologies, hypogamy will prevail since there would not be such a stigma around a union with a more educated woman. I postulate the following hypotheses:

H5: A more egalitarian gender role ideology in a country or a region causes a larger difference in educational homogamy between couples who met online and couples who met offline.

H6: A more traditional gender role ideology in a country or a region causes a larger difference in educational homogamy between couples who met online and couples who met offline.

[4] By highly educated, which is interchangeable with tertiary educated, I mean individuals with some sort of university degree, whether it is the International Standard Classification of Education (ISCED) and its levels 5, 6, 7 and 8, or any type of tertiary education, no matter the length of a cycle.

H7: Traditional gender role ideology in a country or a region will lead to a weaker educational hypogamy in online couples than in offline couples.

Lastly, I am interested in how familialism can interfere with educational assortative mating. Countries with weak family ties are usually associated with early home leaving of young adults (Reher 1988) and greater tolerance for divorce (Kalmijn 2010). On the other hand, familialistic countries are represented by young people leaving their nest late (Reher 1998) and lower tolerance for getting divorced. However, the negative effects of divorce on well-being are weaker in familialistic countries due to the support offered by family members (Kalmijn 2010). Even though there is a gap on the topic of family systems and their impact on assortative mating, I can argue that parents and family members in countries with high rates of familialism will pressure the individual into finding a potential partner. Meeting a mate through family ties and institutions would be reinforced in such countries. Whereas, in individualistic countries, people might not feel as pressured to find a partner, making them choose more carefully. In such countries, emphasis is put on individuals' autonomy, which might suggest that people in such settings are not as dependent on their partner's social status and education. Additionally, I can argue that the internet can be an appropriate way to find a partner for individuals in weak family systems, because their choice of partner is solely dependent on them and not institutional constraints. Therefore, I believe educational heterogamy online will be more prominent in individualistic countries. Highly educated women in such settings might especially emphasise their own autonomy and socioeconomic status, making them more open to partnering down. I am presenting the rest of my hypotheses:

H8: The difference in educational homogamy between couples who met online and couples who met offline is smaller when there are high rates of familism in the country.

H9: High rates of familism in a country or a region will lead to a weaker educational hypogamy in online couples than in offline couples.

3.2 Data Sources

To answer my research questions, I decided to work with the data from the 2nd round of the Generations and Gender Survey (GGS-II) (Generations and Gender Programme 2019), which is a part of the Generations & Gender Programme, see Gauthier, A. H. et al. (2018) or visit the GGP website (https://www.ggp-i.org) for methodological details. The Generations and Gender Survey offers an insight into life-course and family dynamics in multiple countries and regions across the world. Therefore, GGS as a survey dataset not only offers information about life course transitions such as marriage, divorce or cohabitation, but its questions also aim at the respondent's relationship with their current and previous partners (Gauthier et al. 2018). Thanks to the design of the survey, I was able to obtain all the information about couples to conduct my analysis.

Unfortunately, I was not able to use the transition nature of the data due to the lack of information about previous partners regarding their educational attainment. Since I am interested in online dating in contrast to offline dating, using data from GGS I from 2005 was not optimal since online dating experienced its boom around 2013 when apps like Tinder and such were introduced to the market. Therefore, I opted for a cross-national perspective to understand educational assortative mating online. The GGS offers large-scale panel data with an option for international comparison. The datasets from multiple countries also include an independent sample of both women and men whose interviews were conducted separately. Therefore, it is not a household panel. Post-stratification weights were applied to datasets based on the most recent country-specific information on age, gender, region, level of education and marital status. Post-stratification weight provides more reliable data for cross-country comparisons (Gauthier et al. 2018).

As mentioned above, I worked with the 2nd round of GGS, in which 20 countries and territories are participating. Some countries and territories have already conducted their data collection; others are about to. Currently, there are 18 datasets available. The collection of the 2nd round started as early as 2017 and is still ongoing in other countries (Gauthier et al. 2018). Nevertheless, for my analysis, I decided to work with the following 13 countries and regions (see Table 2) mainly because they were based on the same questionnaires and had all the necessary information about the couples needed for my analysis. In these countries and regions, data collection started in 2020 at the earliest. I used the 1st wave of GGS-II (2nd round) in all cases. The reason I chose these countries and territories is highly practical. Some countries in the 2nd round were only Pilot studies; they lacked some unifying variables, such as the ISCED classification of education, whereas in other cases, different types of questionnaires were used. My dataset contains primarily European countries, Hong Kong and Uruguay.

Table 2: Overview of countries and territories used in the analysis.

country	data collection	N
Austria	2022, 2023	2726
Croatia	2023	3007
Czechia	2020, 2021, 2022	2109
Denmark	2021	3441
Estonia	2021, 2022	3579
Finland	2021, 2022	1449
Germany	2021	8670
Hong Kong	2023	1024
Netherlands	2022, 2023	2670
Norway	2020	2147
Sweden	2021	2365
UK	2022, 2023	2538
Uruguay	2021, 2022	1147

Data source: GGS II

To answer my hypotheses concerning country contexts, I decided to use data from other sources. To obtain information about the share of tertiary-educated individuals in each country and region, I used the data provided by OECD: Education at a Glance 2024 (OECD 2024). The Organisation for Economic Co-operation and Development (OECD) is an international organisation whose main goal is to improve social policies worldwide (OECD n. d.). Education at a Glance offers an overview of education around the world using indicators which are widely accepted by professionals to measure education internationally. The 2024 version offers an understanding of educational outcomes gaps and relations between educational attainment and the labour market (OECD 2024). Through the OECD Data Collector, I obtained information on the distribution of 25-64-year-olds by educational attainment in 2023. In the case of Hong Kong, I used data about the educational composition of the population aged 15 and over in Hong Kong in 2023 (The Census and Statistics Department 2024). The data was collected by The Census and Statistics Department (C&SD) which is in charge of conducting surveys and statistical analysis on social and economic statistics (Census and Statistics Department n. d.) and falls under the Education Bureau under the Government of the Hong Kong Special Administrative Region of the People's Republic of China. In the case of Uruguay, I used data from UNESCO, which provided information from the year 2023 about the educational attainment of people who were above the age of 25 and who completed at least a short-cycle tertiary education in the population (UIS n.

d.). UNESCO "is a specialized agency dedicated to strengthening our shared humanity through the promotion of education, science, culture, and communication," (UNESCO n. d.)

Three of my hypotheses take into account the gender ideology of a certain country or region. To assess information about gender role attitudes in each area, I used a joint dataset provided by the European Value Study and World Value Study (EVS/WVS 2024). European Value Study (EVS) is a large-scale, cross-national and longitudinal survey which asks Europeans about their thoughts on family, work, religion, politics, and society. The survey has been conducted every 9 years since 1981. In the newest wave from 2017 (2017-2021, respectively), 37 countries participated in the survey (EVS 2022). Similarly, the World Value Study started collecting its data in 2017 from 66 countries and territories worldwide (Haerpfer et al. 2022). WVS is a "large-scale, cross-national, and repeated cross-sectional survey research program," (EVS n.d.) started in 1981, interested in changing values and the way such values influence political and social life (WVS n.d.). Altogether, the joint dataset consists of 92 countries and territories: 36 from EVS 2017 and 66 from WVS wave 7. I worked with data from Austria, Croatia, Czechia, Denmark, Estonia, Finland, Germany, Hong Kong, the Netherlands, Norway, Sweden, the UK and Uruguay.

Lastly, to obtain information about familialism in a country, I decided to take into account the share of young adults living with their parents in a country or a region, similarly to Kalmijn (2010). For most of the countries, I used data from OECD: Society at a Glance 2024 (OECD 2024), which provided information on the percentage of young adults aged 20-29 living with their parents in the year 2022. Society at a Glance 2024 addresses the lack of quantitative data on trends in social well-being across more than 50 countries and territories. The report also discusses the real and perceived challenges that young people across the world have to currently face (OECD 2024). In the case of Croatia, I was able to find out the share of young people aged 25-34 living with their parents from 2019, provided by Eurostat (Eurostat 2020), the statistical office of the European Union. In the case of Hong Kong, I was only able to access information on the share of people aged 18-45 living with their parents in 2022 by Statista (Ou 2024), which "is a global data and business intelligence platform with an extensive collection of statistics," (Statista n. d.). In the case of Uruguay, I could not find any data about young people living with their parents.

3.3 Sampling and Variables

My sample consisted of 13 individual datasets from 13 countries and regions with which I worked individually as well as in a merged file. In cleaning the data, I followed previous studies (Skopek et al. 2011; Neyt, et al. 2019; Quin, Hu 2024). Firstly, I cleaned

the individual datasets by removing respondents who were single. I also got rid of same-sex couples because, in most datasets, the size of such a couple group was not big enough and, therefore, representative. In the case of Germany, I also deleted couples with inter-sex individuals since inter-sex as gender was an option in the German survey. In Finland and Austria, respondents had the option 'Other' to describe their gender. I dropped couples with such individuals from the dataset and kept the overall sample strictly to couples consisting of a man and a woman.

Next, I deleted respondents who were studying or whose partner was still in education at the time of the interview. I deleted students because I wanted to keep respondents whose educational attainment was not likely to change and whose educational journey had most likely ended. Information about age was not available as a singular variable. Nevertheless, I was able to calculate the age of the respondent by their year of birth and the interview year. Since the age range of interviewees in all countries and territories was not consistent, I decided to limit my sample to the smallest age range out of all countries, which in my case was in Denmark (18 – 49 years). Therefore, I kept respondents whose age range is from 18 to 49 years old. I used listwise deletion. In the end, my dataset, which contained all countries and regions, consisted of 36872 observations. For the number of observations in each region and country, see Table 2.

3.3.1 Dependent variable

I created two dependent variables. The first variable was a binary one that measured whether the **couple was educationally heterogamous or not** (0=homogamy, 1=heterogamy). To create the variable, I used the question in the interview that asked the respondents: "What is the highest level of education you have completed?" The answers were coded into groups characterised by the International Standard Classification of Education (ISCED). Since I was working with multiple countries and regions, I found it fitting to use the ISCED classification instead of the educational system groups unique to each country and region. Because lower secondary education is an obligatory level of education, I deleted respondents who only obtained pre-primary (ISCED 0) and primary (ISCED 1) education. Because of the small size of certain educational groups in some countries and regions, I decided to combine data into three educational groups: ISCED 2 (lower secondary education), ISCED 3-4 (upper secondary education, post-secondary non-tertiary education) and ISCED 5-8 (short-cycle tertiary education, bachelor's or equivalent, master's or equivalent, doctoral or equivalent). I repeated the same process with the respondent's partner.

The binary dependent variable was then created by simply differentiating between whether the partners shared the same level (homogamy) of education or not (heterogamy). The number of levels they were differentiated by was not part of the

analysis. Afterwards, I decided to consider, in the case of educational heterogamy, whether the more educated in a couple is a man or a woman. My second dependent variable had three values: 1 = hypogamy (a woman is more educated than a man), 2 = hypergamy (a man is more educated than a woman), and 3 = homogamy (same education).

3.3.2 Independent variables

My primary independent variable was measuring whether the couple met online or offline, i.e. not through the means of the internet. In the GGS survey, respondents were asked: "How did you and your partner meet?" Respondents then had 12 options of answer to choose from: (1) Through work, (2) In education (School, University, College etc.), (3) At church or equivalent, (4) Online dating, (5) Other online setting, (6) Vacation or business trip, (7) At a bar, nightclub or dance club, (8) Through a social organization, health club, gym or volunteer group, (9) At a private party or social event, (10) Through friends, (11) Through family and (12) Other. In the case of Norway, meeting online was not specified, and respondents could only choose the option "Online." Options "Through friends" and "Through family" were merged into one "Through friends and family" for the Norwegian dataset. The German questionnaire had the option of meeting "Through partner ad." I deleted respondents who chose such an option since I could not determine whether to consider this way of meeting online or offline. I also omitted the option "Other" from my analysis in all areas because I could not correctly tell whether the meeting had been online or offline. In the end, my independent variable that measured **how the couple met** had two values: (0) offline and (1) online.

My other hypotheses also take into account independent variables that are unique for each country and region, such as their **gender ideology**, **percentage of tertiary educated** and the **rate of familism**. To get information about gender ideologies across countries and regions, I used the joint EVS-WVS dataset from 2017 (EVS/WVS 2017), which included questions regarding gender role attitudes and values. In the dataset, I first chose 13 countries and regions that I use in my analysis. In the questionnaire, respondents were presented with a battery of statements regarding gender role attitudes and decide whether they 1) Strongly agree, 2) Agree, 3) Disagree, and 4) Strongly disagree. Options such as "Other" and "Don't know" were deleted from my analysis. My goal was to create a scale variable which would indicate whether the respondent is less or more traditional. Specifically, I used the following statements:

1) *Men make better political leaders than women do.*
2) *University is more important for a boy than for a girl.*
3) *A pre-school child suffers with a working mother.*
4) *Men make better business executives than women do.*

In the case of rates of highly educated, I simply worked with the percentages of education levels in each country and region. Similarly, with the rate of familialism, I obtained information about young adults living with their parents in each country and region.

3.3.3 Control variables

In my analysis, I controlled for a set of variables that might have disrupted the associations between educational assortative mating and the way the couple met. Since I was working with a couple as a singular unit, I would have to obtain information from both mates, which in the GGS dataset was limited. Therefore, I controlled for the **respondent's education** as well as the **partner's education**. Since I worked strictly with mixed-sex couples, I did not find a point in including gender in the analysis because one observation corresponds with one heterosexual couple. I included all couples regardless of their relationship type (married, cohabiting, dating).

3.4 Analytical Methods

First of all, I started my analysis in a descriptive nature. Hence, I focused on the distribution of dependent and independent variables, as well as their relationship in the form of contingency tables for each country and region. However, the backbone of my analysis is binary and multinomial logistic regression, which I performed on the joint dataset with all countries and regions, as well as on each country and region separately.

Generally, the logistic regression method is a suitable tool for testing hypotheses which take into account a relationship between a dependent variable which is categorical and one or more independent predictor variables which could be categorical as well as continuous (Peng et al. 2010). Logistic regression resembles linear regression. However, response variables in logistic regression are binomial, hence lack natural scales, and their outcomes are not numerical (Xu et al. 2010; Sperandei 2014). In contrast to OLS regression, which measures the change of the dependent variable based on a unit change in the independent variable, the logistic regression method differs in the fact that its main ability is to model raw logistic regression coefficients and odds ratios. These estimates only tell us if the probability of an outcome increases or decreases, but they do not measure how much it changes (Sperandei 2014; Howell-Moroney 2023). With some modifications, logistic regression analysis can also be used when the dependent variable is multinomial, i.e. having more than two categories (Hashimoto et al. 2019).

To pick an appropriate multiple logistic regression model, I performed the likelihood-ratio test (LR-test) for nested models and used BIC to compare all models. My preferred model included the respondent's educational attainment, their partner's educational attainment and a place of meeting as independent variables and had the lowest BIC. I also considered models without the couple's academic levels, but previous research has shown that especially highly educated individuals benefit from online dating (Potarca 2021). I also tested models with year cohorts in which a couple started cohabiting, since swiping-based dating apps, which were introduced around 2012, could influence educational assortative mating. Nevertheless, there were no significant differences between the periods and my goal was not to see differences over time, therefore I opted for a simpler model. See Appendix A for additional results with more control variables.

In the main body of the thesis, I am working with my preferred model, which includes a dependent variable with two (homogamy, heterogamy) and three (homogamy, hypergamy, hypogamy) outcomes. The independent variable is the place the couple met (online, offline) and control variables include the respondent's education level (lower secondary, upper and post-secondary, tertiary) and the respondent's partner's education level (same categories). For a joint dataset containing all cases from 13 countries and regions, I estimated logit regression models which predicted the log odds of educational heterogamy. Therefore, educational heterogamy was coded as 1 and meant the event occurred, if the outcome was 0, it indicated educational homogamy and the event did not occur. Similarly, I conducted multinomial logit regression predicting educational hypergamy and hypogamy, with educational homogamy being the reference category.

Afterwards, I repeated the process for each country and region separately. Since I was working with cross-national data, to interpret and compare the results across areas, I used average marginal effects (AME) of, in the logit regression case, an online meeting on heterogamy. In the case of multinomial logit regression, I estimated the average marginal effects of online meetings on homogamy, hypergamy, and hypogamy. The reason I use average marginal effects is that they "measure the average change in probability that results from a unit change in X. This makes marginal effects easier to comprehend than log odds or odds ratios because they use the metric of probability for the outcome (Howell-Moroney, 2023, p. 1219). It is also impossible in logistic regression to compare regression coefficients and odds ratios across different models with different samples and groups, similar to my many models for each country and territory. It is argued that as opposed to log odds and odds ratios, marginal effects and specifically average marginal effects are collapsible, which means that the results of the AME method can be compared across models, groups and samples (Xiao et al. 2021; Howell-Moroney, 2023). Additionally, odds ratios or log-odds ratios are also not appropriate for comparing models because they reflect a degree of unobserved heterogeneity. "Unobserved heterogeneity is the variation in the dependent variable that is

caused by variables that are not observed (i.e. omitted variables)," (Mood 2010:67). AMEs on the other hand, are good for comparing results across models, samples and nations because they are not affected by unobserved heterogeneity (Mood 2010).

Lastly, I created scatter plots which showcase the association between a population's criteria (on the X axis) and the probability of educational heterogamy and hypogamy in online couples versus offline couples (on the Y axis). Similarly to a previous study by Potarca and Mills (2015), I conduct simple linear regression with AMEs of educational heterogamy and hypogamy for 13 populations as dependent variables and population-specific characteristics (tertiary-educated individuals, gender ideology, familialism) as independent variables. Analytic weights are applied to the regression in the form of the square of the standard errors of AMEs. By assigning weights to populations, I give more power to countries with small standard errors (Liefbroer, Zoutewelle-Terovan 2021). For better interpretation, regression lines are added to the scatter plots. To conduct my analysis, I worked with the statistical software STATA.

4 Results

4.1 Descriptive Analysis

Firstly, I investigate union formation based on the relationship between the educational levels of both partners in each country and region. Table 3 showcases the relative distribution of hypogamy, hypergamy and homogamy in each country and region.

Table 3: Relative distribution of educational assortative mating by all countries and regions separately. GGS II. Multiple populations. N = 36872.

country	hypogamy	hypergamy	homogamy	Total	N
Austria	17.9%	15.3%	66.8%	100	2726
Croatia	25.2%	8.7%	66.1%	100	3007
Czechia	35.4%	12.7%	51.9%	100	2109
Denmark	23.2%	6.9%	69.9%	100	3441
Estonia	30.9%	10.5%	58.6%	100	3579
Finland	23.5%	7.4%	69.1%	100	1449
Germany	14.9%	17.8%	67.3%	100	8670
Hong Kong	12.5%	11.5%	76.0%	100	1024
Netherlands	22.3%	10.5%	67.3%	100	2670
Norway	23.8%	6.8%	69.5%	100	2147
Sweden	26.5%	7.4%	66.1%	100	2365
UK	21.3%	9.1%	69.5%	100	2538
Uruguay	30.4%	14.0%	55.6%	100	1147
All countries and regions	22.5%	11.7%	65.8%	100	36872

Data source: GGS II

We can see that educational homogamy is dominant in all countries and regions, similar to the joint dataset containing all countries and regions. The highest rate of homogamy could be found in Hong Kong (76%), followed by Denmark (69.9%) and Norway and the United Kingdom (69.5%). The lowest number of homogamous unions can be found in Czechia (51.9%), a little more in Uruguay (55.6%) and Estonia (58.6%).

In the case of heterogamy, the table differentiates between hypogamous unions, with a more educated woman, and hypergamous unions, in which a man is more educated. The relative distribution is not as unambiguous as in the case of homogamy.

Hypogamy prevails in the majority of countries and regions except for Germany. The highest rate of hypogamy is in the Czech Republic (35.4%), followed by Estonia (30.8%) and Uruguay (30.4%). Similarly, the most significant difference between the rates of educational hypogamy and heterogamy (not shown in Table 3) is in Czechia (22.7%), Estonia (20.5%) and Sweden (19.1%). The lowest rate of hypergamy is in Norway (6.8%), in contrast to Germany, with the highest relative hypergamy out of all countries and regions (17.8%). Overall, educational homogamy is the dominant form of a partner union in all countries and regions (65.8%), educational hypogamy being the second most common formation (22.5%) in 12 out of 13 countries and regions.

Table 4: Relative distribution of couples based on whether they met offline or online by all countries and regions separately. GGS II. Multiple populations. N = 36872.

country	offline	online	Total	N
Austria	84.2%	15.9%	100	2726
Croatia	91.5%	8.5%	100	3007
Czechia	86.2%	13.8%	100	2109
Denmark	80.2%	19.9%	100	3441
Estonia	82.5%	17.5%	100	3579
Finland	77.0%	23.0%	100	1449
Germany	82.1%	17.9%	100	8670
Hong Kong	86.1%	13.9%	100	1024
Netherlands	80.8%	19.2%	100	2670
Norway	85.3%	14.7%	100	2147
Sweden	82.9%	17.1%	100	2365
UK	78.6%	21.4%	100	2538
Uruguay	88.2%	11.8%	100	1147
All countries and regions	83.1%	16.9%	100	36872

Data source: GGS II

Next, I present Table 4, in which we can see the relative distribution of couples who met online and couples who did not meet via the internet (offline). Overall, in all countries and regions, meeting in the real world remains the most common way romantic partners meet. The strongest tendency towards meeting an intimate partner via the internet is in Finland (23%), the United Kingdom (21.4%) and Denmark (19.9%). The lowest number of online couples is in Croatia (8.5%), Uruguay (11.8%) and the Czech Republic (13.8%).

Table 5: The combinations of women's and men's education in offline and online couples in the joint dataset containing all countries and regions. GGS II. Multiple populations. N = 36872.

offline					
woman's education	**man's education**				
	lower secondary (ISCED 2)	**upper and post-secondary (ISCED 3-4)**	**tertiary (ISCED 5-8)**	**Total**	**N**
lower secondary (ISCED 2)	1.7%	1.7%	0.5%	3.9%	1194
upper and post-secondary (ISCED 3-4)	3.1%	22.2%	9.3%	34.6%	10600
tertiary (ISCED 5-8)	1.8%	17.1%	42.6%	61.5%	18854
Total	6.6%	41.0%	52.4%	100%	30648

online					
woman's education	**man's education**				
	lower secondary (ISCED 2)	**upper and post-secondary (ISCED 3-4)**	**tertiary (ISCED 5-8)**	**Total**	**N**
lower secondary (ISCED 2)	1.4%	2.0%	0.8%	4.2%	263
upper and post-secondary (ISCED 3-4)	3.2%	21.0%	10.0%	34.2%	2128
tertiary (ISCED 5-8)	2.0%	19.4%	40.2%	61.6%	3833
Total	6.7%	42.4%	50.9%	100%	6224

Data source: GGS II

I was also interested in who these couples meeting online are. In Table 5, I present combinations of men's and women's education levels in a union based on whether they met online or offline in the whole dataset, with all countries and regions combined. As we can see, the rates do not differ as much between online and offline couples. There is almost the same number of tertiary-educated women in online couples (61.6%) and offline couples (61.5%). There are a bit more tertiary-educated men offline (52.4%) than in the online space (50.9%). If we look at the diagonal line, there are indeed more educational homogamous couples offline (66.5%) than online (62.6%).

The same results could be found in Table 6, which showcases the relative distribution of whether the pair met offline or online based on the educational form of a couple by every country and region, separately and merged. Firstly, offline couples are the most homogamous in Hong Kong (77.4%), whereas the least homogamous, therefore having the highest heterogamy rate offline, are in the Czech Republic (52.6%). If we look closer at heterogamy offline, hypogamy prevails in most countries and regions except for Germany (14.4%) and in Hong Kong, relative hypogamy and hypergamy are roughly the same (11.3% and 11.2%). The highest hypogamy rate in offline couples is in Czechia (35.5%). Additionally, the most significant difference between offline hypogamy and hypergamy is also in the Czech Republic (23.5%, not in the table). In the whole dataset, educational homogamy is the dominant educational relationship form in both online and offline couples. Nevertheless, online couples display lower educational homogamy (62.6%) than offline couples (66.5%). Regarding relative heterogamy, hypogamy prevails in both settings, however, there are more couples

Table 6: The distribution of educational assortative mating by the place the couple met in all countries and regions separately. GGS II. Multiple populations. N = 36872.

	meeting place	hypogamy	hypergamy	homogamy	Total	N
Austria	offline	17.8%	14.7%	67.6%	100.0%	2294
	online	18.3%	19.0%	62.7%	100.0%	432
Croatia	offline	25.3%	8.8%	65.9%	100.0%	2752
	online	23.9%	7.8%	68.2%	100.0%	255
Czechia	offline	35.5%	11.9%	52.6%	100.0%	1818
	online	34.7%	17.5%	47.8%	100.0%	291
Denmark	offline	22.4%	7.1%	70.4%	100.0%	2758
	online	26.4%	5.7%	67.9%	100.0%	683
Estonia	offline	30.1%	10.1%	59.9%	100.0%	2953
	online	35.0%	12.5%	52.6%	100.0%	626
Finland	offline	22.0%	6.8%	71.2%	100.0%	1116
	online	28.8%	9.3%	61.9%	100.0%	333
Germany	offline	14.4%	17.7%	67.9%	100.0%	7120
	online	17.4%	18.3%	64.3%	100.0%	1550
Hong Kong	offline	11.3%	11.2%	77.4%	100.0%	882
	online	19.7%	13.4%	66.9%	100.0%	142
Netherlands	offline	22.4%	10.2%	67.5%	100.0%	2157
	online	21.8%	11.5%	66.7%	100.0%	513
Norway	offline	23.2%	6.6%	70.3%	100.0%	1831
	online	27.5%	7.9%	64.6%	100.0%	316

	meeting place	hypogamy	hypergamy	homogamy	Total	N
Sweden	offline	25.7%	7.0%	67.3%	100.0%	1961
	online	30.5%	9.7%	59.9%	100.0%	404
UK	offline	20.5%	9.0%	70.6%	100.0%	1994
	online	24.5%	9.7%	65.8%	100.0%	544
Uruguay	offline	30.2%	14.1%	55.6%	100.0%	1012
	online	31.9%	12.6%	55.6%	100.0%	135
All countries and regions	offline	22.0%	11.5%	66.5%	100.0%	30648
	online	24.6%	12.8%	62.6%	100.0%	6224

Data source: GGS II

with more educated women and less educated men online (24.6%) than offline (22%). Hypergamy is slightly more common online (12.8%) than offline (11.5%).

When we take a look at online couples in each country and region, homogamy is not as strong as in offline couples. Among online couples in the Czech Republic, partners being educationally different is interestingly more common than educational homogamy (47.8% of educationally homogamous couples in contrast with 52.2% of educationally heterogamous couples). Nevertheless, in Croatia homogamy is more common in online couples than in couples who did not meet via the internet. Uruguay is a country which is similarly homogamous both online and offline. The biggest difference between homogamy online and offline is in Hong Kong (10.5%, not displayed in the table), in favour of stronger homogamy offline.

Investigating the couples who met online and who also consist of differently educated partners, hypogamy is more common than hypergamy in all countries except for Austria and Germany. Hypogamy online has the biggest lead over online hypergamy (not visible in the table) in Estonia (22.5%), Sweden (20.8%) and Denmark (20.6%). The rates of relationships with more educated women and less educated men online in comparison to offline have had the biggest rise in Hong Kong (8.4%) and Finland (6.9%), these results are not presented in the table. Therefore, educationally hypogamous unions seem to be more common online than offline.

4.2 Binary and Multinomial Logistic Regression

In the next part of my analysis, I present results from conducting binary and multinomial logistic regressions. My preferred model, which had the most observations and took into account all appropriate couple characteristics, was also most suitable according to BIC (see Appendix A). It contains the place of meeting, respondent's and respondent's partner's educational level as independent variables. In the case of binary

logistic regression, the occurring event is educational heterogamy. With multinomial logistic regression, my reference category was educational homogamy. Instead of presenting regression coefficients from each country and region. I opted for average marginal effects, which showcase predicted probabilities of an event occurring. Predicted probabilities are suitable for cross-national comparison because, unlike with regression coefficients, my national and regional models can consist of different samples in sizes. For regression coefficients, see the Appendix A.

Table 7: Average marginal effects (AMEs) with standard errors in brackets of meeting online on educational heterogamy compared to offline meeting. Binary logistic regression. GGS II. Multiple populations. N = 36872.

country	heterogamy	N
Austria	0.0428*	2726
	(0.0247)	
Croatia	-0.0246	3007
	(0.0298)	
Czechia	0.0464	2109
	(0.0288)	
Denmark	0.0106	3441
	(0.0169)	
Estonia	0.0597**	3579
	(0.0205)	
Finland	0.0716**	1449
	(0.0265)	
Germany	0.0162	8670
	(0.0127)	
Hong Kong	0.1067**	1024
	(0.0345)	
Netherlands	0.0015	2670
	(0.0212)	
Norway	0.0410	2147
	(0.0260)	
Sweden	0.0698**	2365
	(0.0241)	
UK	0.0464**	2538
	(0.0217)	
Uruguay	0.0016	1147
	(0.0451)	
All countries and regions	0.0367***	36872

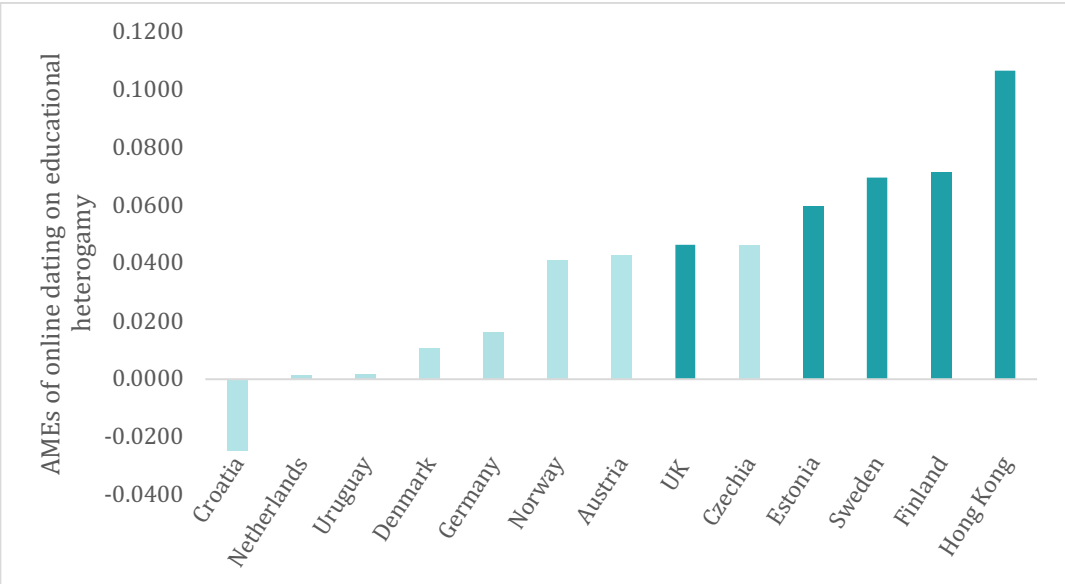
country	heterogamy	N
	(0.0064)	

* p < 0.10; ** p < 0.05; *** p < 0.001; Based on a binary logistic model containing educational assortative mating as a dependent variable (if the event occurs, the couples is heterogamous), independent variables such as place of meeting, respondent's educational level and respondent's partner's educational level. Data source: GGS II

When I break down my preferred model into individual countries and regions, in Table 7 I present the average marginal effects (AMEs) of meeting online (in comparison to offline meetings) on the probability of educational heterogamy. Average marginal effects are interpreted as predicted probabilities (in percentages) of an event occurring, in contrast to regression coefficients, which showcase log odds.

We see in Table 7 that the effect of online dating on educational heterogamy varies; in some countries, the effects are not even statistically significant. Czechia, Denmark, Germany, the Netherlands, Norway and Uruguay all show positive effects of online places of meeting on educational heterogamy of partners, nevertheless, without a statistical significance. Only in Croatia does online dating have a negative effect on educational heterogamy, but without the statistical significance.

Figure 1: Average marginal effects (AMEs) of meeting online on the probability of educational heterogamy compared to offline meeting by countries and regions. Dark colour highlighting statistical significance. GGS II. Multiple populations. N = 36872.



Data source: GGS II

Estonia, Finland, Hong Kong, Sweden, and the UK are all countries and regions that show positive effects of online meeting on the educational heterogamy of partners, with a statistical significance (at least $p < 0.05$). The strongest effect of online meetings on educational heterogamy is observed in Hong Kong, where the probability of pairing up with an educationally different partner is higher by 10.67% in an online space compared to an offline space. In Finland, this figure is 7.16%, followed by Sweden at 6.98%. In terms of all countries and regions combined, the effect of a meeting via the internet on the probability of educational heterogamy is 3.67 % and is statistically significant ($p < 0.001$).

Therefore, I can argue that my first hypothesis can be accepted: couples who met via the internet showcase weaker homogamy than couples who met through traditional means, i.e. offline. Nevertheless, on a cross-national level, H1 gained limited support. In statistically significant countries and regions, Estonia, Finland, Hong Kong, Sweden and the UK, the online setting has a positive effect on educational heterogamy; nevertheless, in Croatia, online meetings had a negative effect on educational heterogamy, though without statistical significance.

Table 8: Average marginal effects (AMEs) with standard errors in brackets of meeting online on the probability of educational hypogamy, hypergamy and homogamy compared to offline meeting. Multinomial logistic regression. GGS II. Multiple populations. N = 36872.

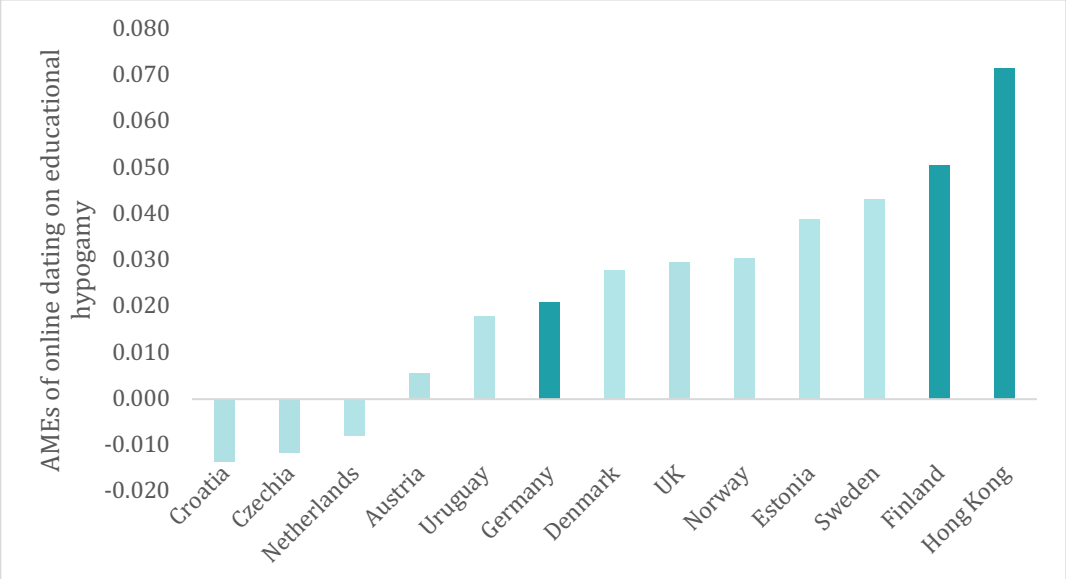
country	hypogamy	hypergamy	homogamy	N
Austria	0.0055	0.0368*	-0.0423*	2726
	(0.0201)	(0.0197)	(0.0247)	
Croatia	-0.0136	-0.0107	0.0243	3007
	(0.0273)	(0.0174)	(0.0298)	
Czechia	-0.0115	0.0576*	-0.0461	2109
	(0.0282)	(0.0235)	(0.0289)	
Denmark	0.0278*	-0.0172*	-0.0106	3441
	(0.0166)	(0.0096)	(0.0169)	
Estonia	0.0389*	0.0203	-0.0592**	3579
	(0.0199)	(0.0138)	(0.0205)	
Finland	0.0505**	0.0206	-0.0711**	1449
	(0.0251)	(0.0170)	(0.0265)	
Germany	0.0208**	-0.0047	-0.0161	8670
	(0.0100)	(0.0104)	(0.0127)	
Hong Kong	0.0716**	0.0330	-0.1046**	1024
	(0.0309)	(0.0303)	(0.0345)	

country	hypogamy	hypergamy	homogamy	N
Netherlands	-0.0078	0.0091	-0.0013	2670
	(0.0187)	(0.0149)	(0.0212)	
Norway	0.0304	0.0104	-0.0408	2147
	(0.0250)	(0.0153)	(0.0260)	
Sweden	0.0432*	0.0265*	-0.0697**	2365
	(0.0235)	(0.0131)	(0.0240)	
UK	0.0295	0.0131	-0.0426**	2538
	(0.0185)	(0.0144)	(0.0215)	
Uruguay	0.0178	-0.0161	-0.0018	1147
	(0.0412)	(0.0299)	(0.0450)	
All countries and regions	0.0238***	0.0123**	-0.0361***	36872
	(0.0057)	(0.0045)	(0.0064)	

** p < 0.10; ** p < 0.05; *** p < 0.001; Based on a multinomial logistic model containing educational assortative mating as a dependent variable (hypogamy, hypergamy, homogamy as the reference category), independent variables such as place of meeting, respondent's educational level and respondent's partner's educational level. Data source: GGS II*

Next, I present AMEs of online meeting on the probability of educational hypogamy, hypergamy and homogamy (See Table 8). It is apparent that each form of union is only significant in a few countries and regions. The results are in line with AMEs from logistic regression, in most countries and regions, except for Croatia, where online meeting has a negative effect on educational homogamy. In Estonia, Finland, Hong Kong, Sweden and the UK, the results indicating negative probabilities of educational homogamy in an online setting are statistically significant (at least $p < 0.05$). Considering all observations, meeting online indeed decreased the probability of educationally homogamous unions in contrast to meeting offline (by 3.61%).

Figure 2: Average marginal effects (AMEs) of online meeting on the probability of educational hypogamy across countries and regions. Dark colour highlighting statistical significance. GGS II. Multiple populations. N = 36872.



Data source: GGS II

If we look at unions with more educated women and less educated men, it seems that meeting a spouse on the internet has positive effects on the probability of educational hypogamy in all countries, except for Croatia, Czechia and the Netherlands (though without statistical significance). The results indicating a positive effect did not reach statistical significance in all countries either. Educational hypogamy is only statistically significant in Finland, Germany and Hong Kong ($p < 0.05$). The strongest probability of educational hypogamy is in Hong Kong (7.16%), followed by Finland (5.05%). Considering the whole sample, hypogamy was shown to be statistically significant, with an increase of 3.37% in the probability of an educationally hypogamous union when meeting online, in comparison with meeting through other means than the internet.

Considering hypergamy, a union in which a man is more educated than a woman, the results are mixed, showing both positive and negative effects of internet dating. In the Czech Republic, online couples have a larger probability of being composed of a more educated man and a less educated woman by 5.76% in contrast to offline couples. Hypergamy in the whole sample was statistically significant and showcased a stronger probability of educational hypergamy in online couples than offline couples by 1.23%.

Thus, the second hypothesis, "Meeting online will lead to a stronger educational hypogamy than if the couple met offline," has gained limited support. Additionally, stronger hypogamy online seems to be a trend in all countries except for Croatia,

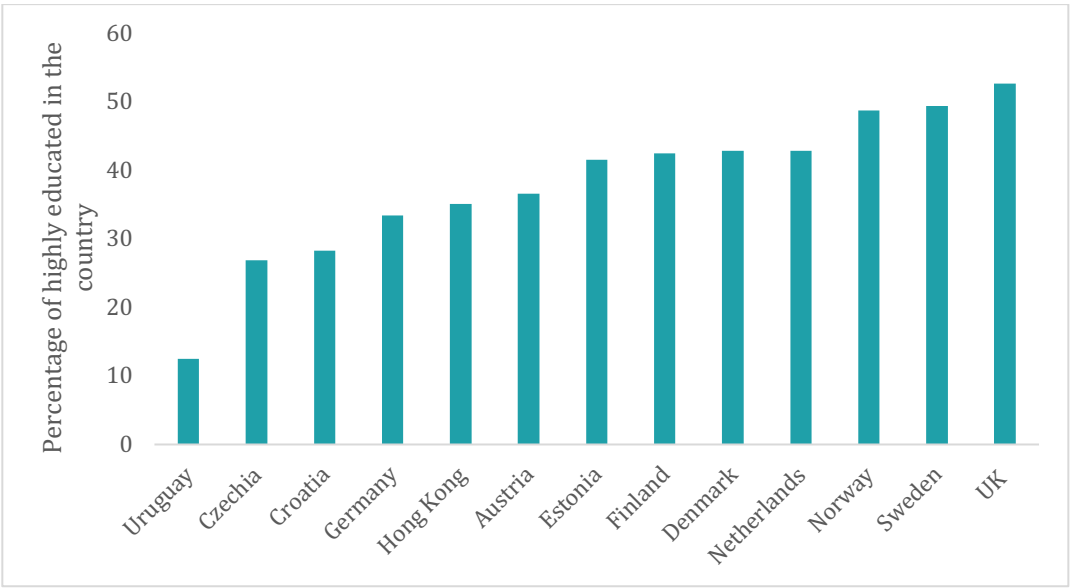
Czechia and the Netherlands. This hypothesis holds true for the sample encompassing all countries and regions, where the probability of educational hypogamy increases by 2.38% when couples meet online compared to offline. Hypogamy is increased due to online meeting in Finland, Germany and Hong Kong ($p < 0.05$).

4.3 Macro Hypotheses

4.3.1 Tertiary educated in the population

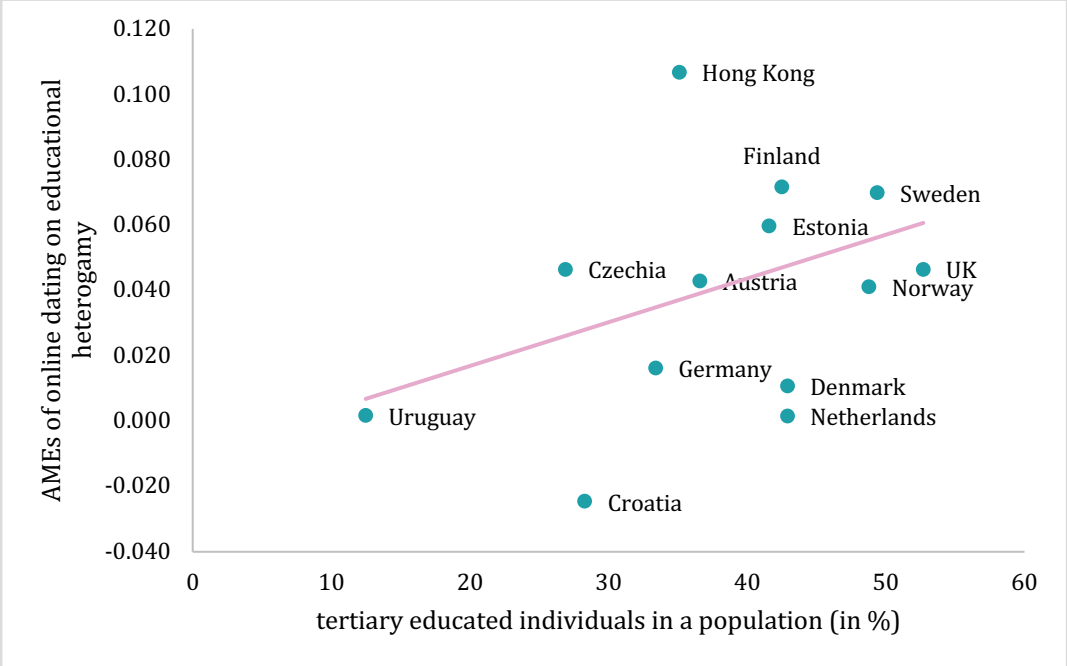
Next, to test my hypotheses, which take into country's or region's certain characteristics, I present scatter plots with AMEs of online meeting on educational heterogamy and educational hypogamy compared to offline couples. The average marginal effects are the results from logistic and multinomial logistic regression, presented in Tables 7 and 8. Firstly, I want to present the correlation between the number of tertiary-educated individuals in countries and regions and the probability of educational heterogamy in online couples compared to offline couples. See Figure 3 for a share of tertiary-educated individuals in a population across countries and regions. Figure 4 illustrates the probability of educational heterogamy in online couples compared to offline couples, depending on the share of tertiary-educated individuals in the population.

Figure 3: Relative distribution of tertiary-educated individuals across countries and regions.



Data source: OECD, The Census and Statistics Department, UNESCO

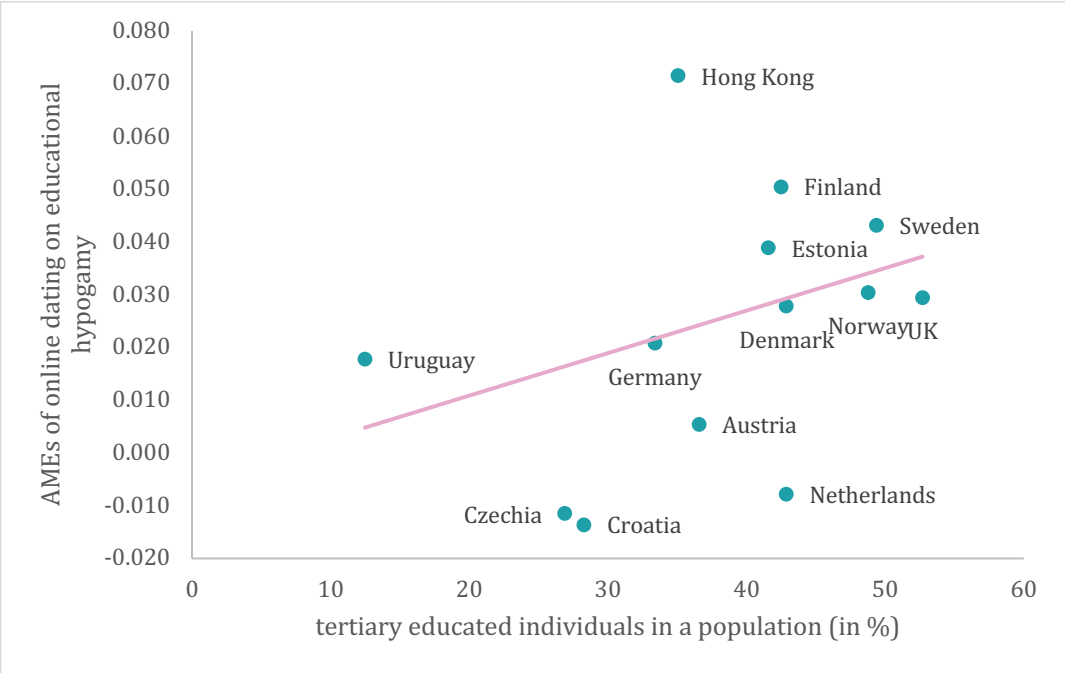
Figure 4: AMEs of online meeting on the probability of educational heterogamy in online couples compared to offline couples, by the share of tertiary-educated individuals in the population. Multiple populations.



Data source: GGS II, OECD, The Census and Statistics Department, UNESCO

If we look at the regression line (see Appendix A for all results of linear regression), there is a trend of growing educational heterogamy online with an increase of tertiary-educated individuals in the country. However, linear regression results show a fairly weak effect and no statistical significance ($b = 0.0016$, $p = 0.08$). I did not find sufficient evidence to support my third hypothesis: "a higher share of people with a tertiary education will lead to a larger difference in educational homogamy between couples who met online and couples who met offline."

Figure 5: AMEs of online meeting on the probability of educational hypogamy in online couples compared to offline couples, by the share of tertiary-educated individuals in the population. Multiple populations.



Data source: GGS II, OECD, The Census and Statistics Department, UNESCO

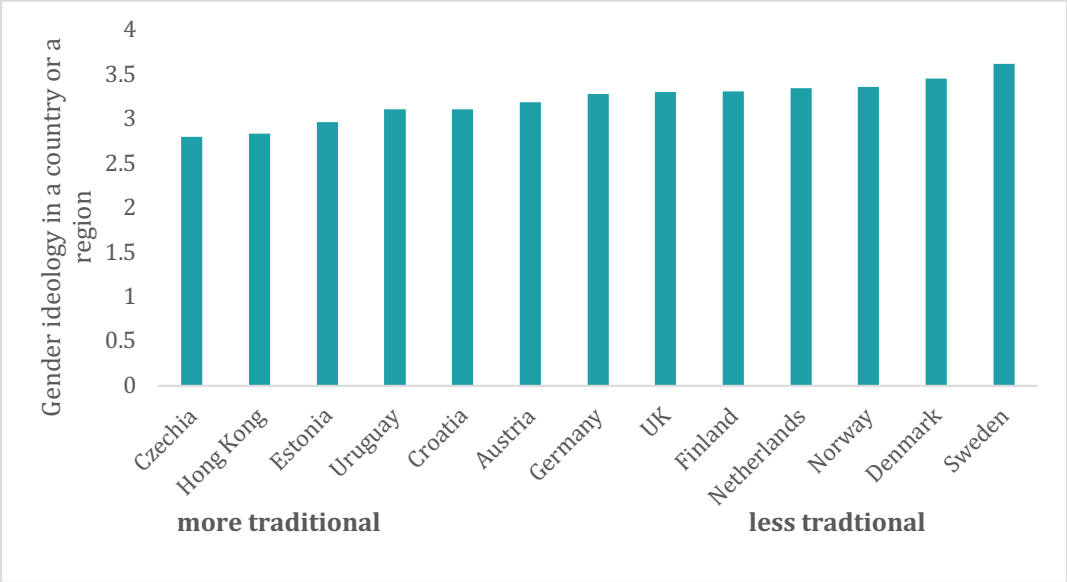
The same results are presented in Figure 5, except that the AMEs represent the probability of educational hypogamy in online couples, in other words, the difference in educational hypogamy between online and offline couples. The outliers, Hong Kong, Uruguay and the Netherlands, make interpreting the results complicated; nevertheless, in the rest of the countries, the correlation diagram shows a growing trend in probability of educational hypogamy with increase in the rate of tertiary-educated people in the country. However, results lack statistical significance (b = 0.0008, p = 0.217), therefore making me unable to accept my fourth hypothesis: "a higher share of people with a tertiary education will lead to a larger difference in educational hypogamy."

4.3.2 Gender ideology in a country or a region

Figure 6 showcases gender ideology across regions and countries from more traditional to less traditional societies. The gender ideology indicator is an index made of several questions regarding gender-role values in the region, with 1 indicating the most traditional society and 4 indicating the least traditional society. Nevertheless, no

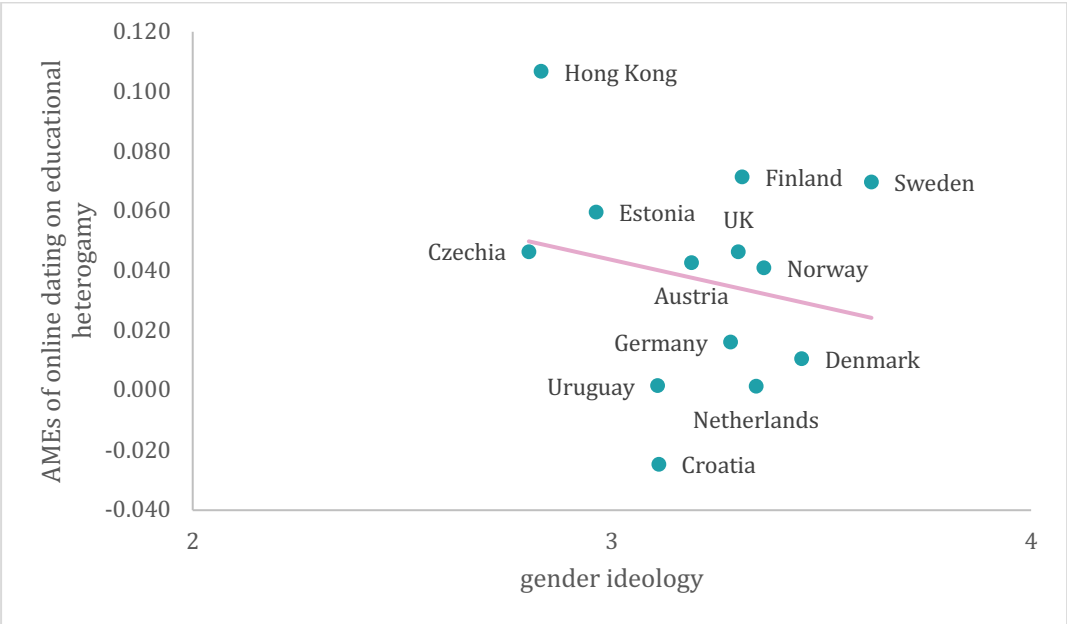
area has a value lower than 2.5 points. In Figure 7, the same AMEs of online dating on educational heterogamy are displayed, similar to Figure 4. Nevertheless, this time, gender ideology in the population is displayed on the X-axis.

Figure 6: Gender ideology across countries. Ranked from more traditional to less traditional.



Data source: EVS/WVS

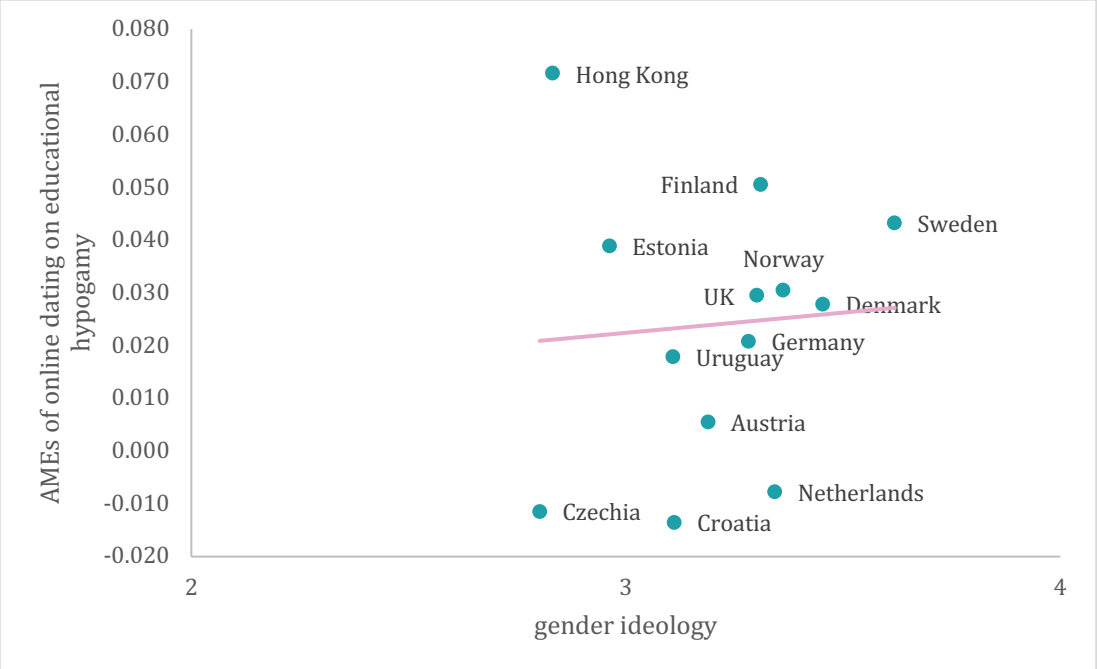
Figure 7: AMEs of online meeting on the probability of educational heterogamy in online couples compared to offline couples, by gender ideology in the society.



Data source: GGS II, EVS/WVS

Points in the diagram hardly align with the regression trend line, which showcases a decreasing trend of educational heterogamy online with an increase in egalitarian gender ideology. Results lack statistical significance (b = -0,036, p = 0.49). My fifth hypothesis, which predicted that more egalitarian countries differ more in online and offline space on the grounds of educational homogamy, i.e. showcasing stronger heterogamy online cannot be accepted. Hypothesis 6 states that "a more traditional gender role ideology in a country or a region causes a larger difference in educational homogamy between couples who met online and couples who met offline." I did not find sufficient evidence to support the sixth hypothesis.

Figure 8: AMEs of online meeting on the probability of educational hypogamy in online couples compared to offline couples, by gender ideology in the society.



Data source: GGS II, EVS/WVS

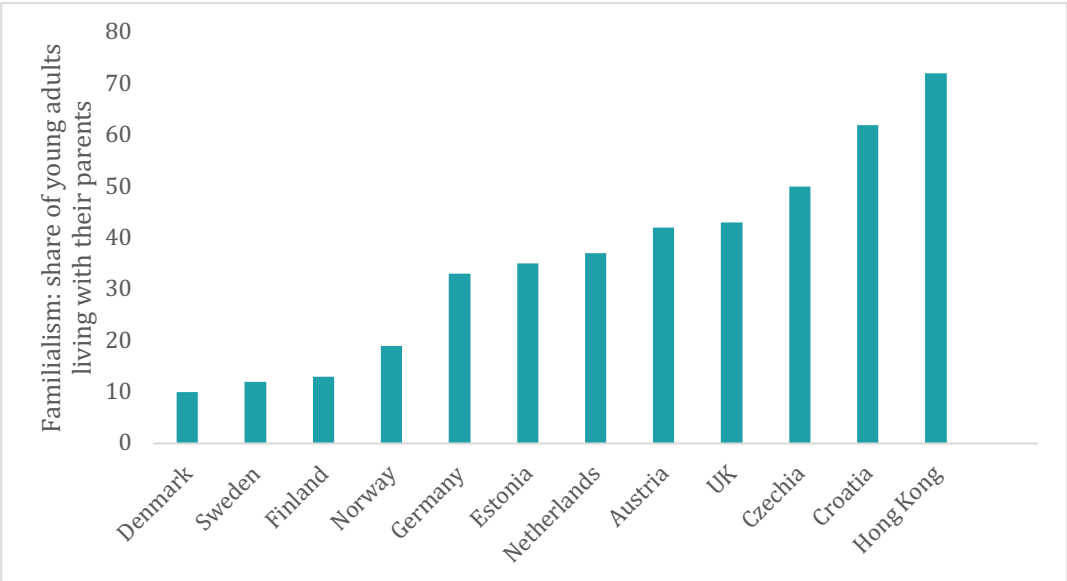
With educational hypogamy, there is a slight growing trend of educational hypogamy with a decrease in gender role traditionalism. My seventh hypothesis states that in countries with a more traditional gender role ideology, there will be a weaker educational hypogamy in online couples than in offline couples. While the direction of the effect is positive (Figure 8), my result are not statistically distinguishable from zero (b = 0.0062, p = 0.87) and I cannot accept hypothesis 7.

4.3.3 Familialism in the population

Lastly, I present probabilities of educational heterogamy and hypogamy in online couples versus offline couples and a share of young adults living with their parents in a population as an indicator of familialism in the society. There is an absence of Uruguay since I was unable to obtain up-to-date data about young adults still living with their parents (see Figure 9).

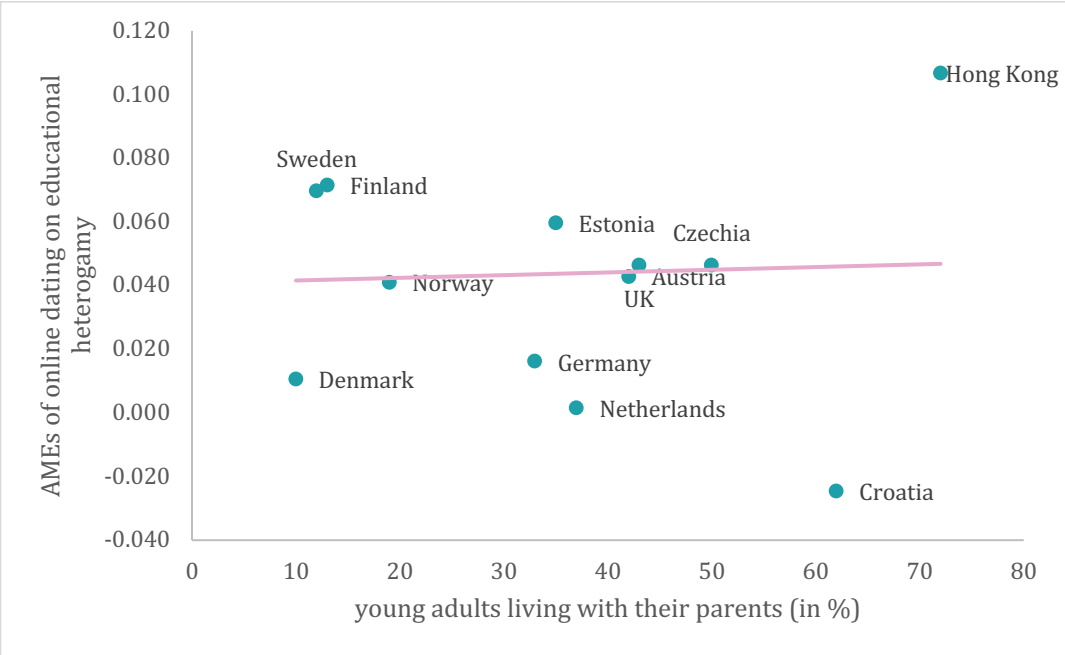
In Figure 10, regression line shows a very slight upward trend, probably caused by the position of Hong Kong. The rest of the countries show a rather negative trend of educational heterogamy online, with the increase of familialism. Results show small effect with no statistical significance (b = 0.00015, p = 0.8). My eighth hypothesis, which expects high familism to correlate with lower probabilities of educational heterogamy cannot be accepted.

Figure 9: Relative distribution of young adults living with their parents as an indicator of familialism in the population.



Data source: OECD, Eurostat, Statista

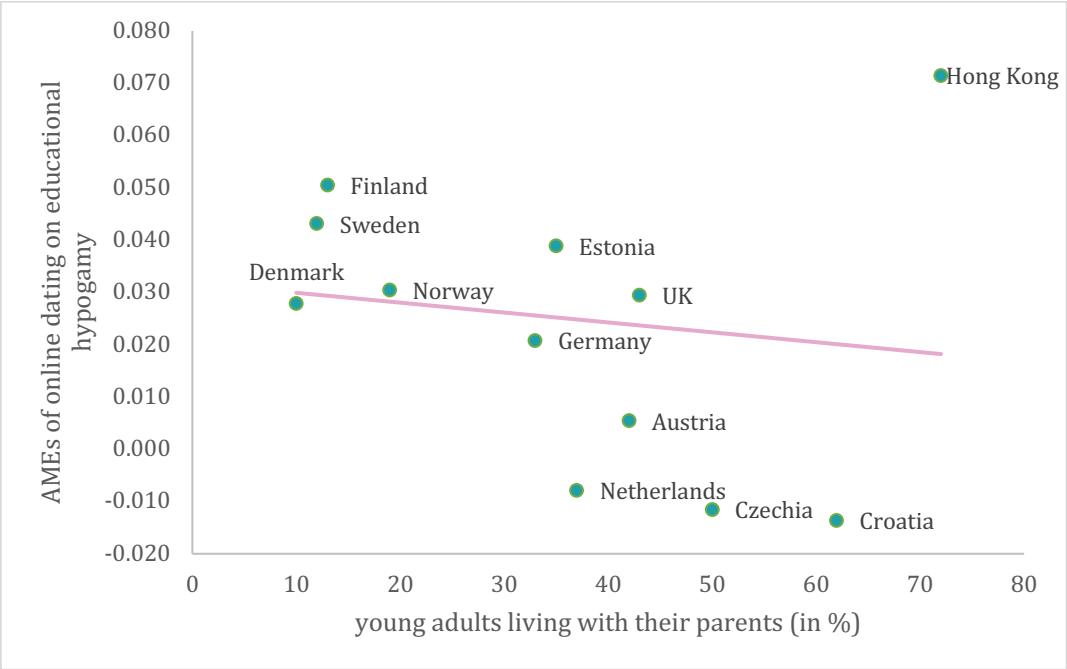
Figure 10: AMEs of online meeting on the probability of educational heterogamy in online couples compared to offline couples, by the share of young people living with their parents in the population.



Data source: GGS II, OECD, Eurostat, Statista

Figure 11 showcases the association between the probability of educational hypogamy online versus offline. Hong Kong as an outlier does not fit the pattern of other countries and the regression line has a downward trend. With a growing number of young adults living with their parents, the probability of educational hypogamy in online couples decreases. Linear regression shows no statistical significance (b = -0.0001, p = 0.8). The last hypothesis, which states that "high rates of familism in a country or a region will lead to weaker educational hypogamy in online couples than in offline couples," did not gain sufficient evidence to be accepted.

Figure 11: AMEs of online meeting on the probability of educational hypogamy in online couples compared to offline couples, by the share of young people living with their parents in the population.



Data source: GGS II, OECD, Eurostat, Statista

5 Conclusion

The advent of the internet has brought a digital revolution to the world of dating. Being often called a "democratizing tool," the internet has partially displaced traditional matchmakers such as friends and family (Rosenfeld 2019). Singles are no longer dependentnt on institutional opportunities in school, at work or at social gatherings to meet the love of their life (Rosenfeld, Thomas 2012). However, due to the reversal of the gender gap in education and its structural implications on the dating market, many people face a scarcity of potential partners in their traditional networks (Potarca 2021). Nevertheless, it is unclear what changes internet dating brought to educational assortative mating. Two assumptions have emerged in the academic literature. The first group of researchers assumes that thanks to the many filters, which allow users to sort their "matches" on dating apps, educational homogamy will be strengthened (Skopek et al. 2011). Nevertheless, the other approach suggests the internet diversifies the pool of potential mates, allowing users to meet people with different sociodemographic traits. Hence, the internet is weakening educational homogamy (Potarca 2017; 2020; Thomas 2020).

In my thesis, I was curious to find out which approach gains support on a cross-national level since most previous studies focused on a single country (Potarca 2020; Thomas 2020; Qian, Hu 2024). Using survey data from the Generations and Gender Survey (Generations and Gender Programme 2019) in 13 countries and territories, I discovered that online dating weakens educational homogamy in contrast to meeting through traditional means. My results, therefore, support the group of studies which indicate that the internet opens up social boundaries and offers its users access to a vast pool of potential partners. Online couples differ from offline couples on the grounds of educational assortative mating, with couples matched through the internet displaying bigger social openness due to the increased probability of educational heterogamy.

One explanation could be in the fact that cyber daters are not as constrained by institutions and their social ties to pick a similarly educated partner (Thomas 2012; Rosenfeld et al., 2019; Potarca 2020). I can argue they have more freedom in picking their spouse based on traits which are more important than socioeconomic status to them (Dutton et al. 2009). With the help of algorithms which collect "swiping" data (Comunello, et al. 2021, Krzywicki et al. 2015), users swipe right on other profiles because they prefer the same interests, family values and attractiveness over educational homogamy. In that way, the internet, which reinforces educational heterogamy, might tell us something about mate preferences.

However, the other explanation could lie in the fact that people turn to the internet when facing scarcity offline, with hopes of finding a similarly educated partner. But when entering the dating apps, they get overwhelmed by the abundance of options,

hoping that someone better could hide in the next swipe. For Zygmunt Bauman (2003), such behaviour on dating apps is indicative of what he calls "liquid love." He points at the gamifying nature of dating apps, which makes potential intimate partners disposable (Bauman 2003). Such individuals either leave the internet dissatisfied because they could not find a similarly educated partner, or they "settle" for someone who matches their other preferences, such as interests or family values, while dropping their preference for a similar educational level.

The results with country-specific variables did not reach statistical significance. However, they showcase underlying relationships which might be resurface when using samples with a higher number of countries. Scatter plots showed that with a growing number of highly educated individuals in the country, the educational heterogamy of online couples versus offline couples increased. This assumption can support the status closure theory (SCT), which states that when the highly educated elite is small, members of the elite mate with each other (Smits 2003). The structural scarcity of potential partners across all education levels imposed by the reversal of the gender gap could therefore lead to more people "migrating" to cyberspace. However, it seems that mostly highly educated individuals benefit from searching for a mate online, potentially due to their smaller time window for finding a partner (Qian, Hu 2017). This is in line with Potarca (2021), who stresses the advantages of well-positioned people who are equipped with technology knowledge in online dating.

When it comes to the population's gender-role attitudes, less traditional countries and regions are associated with lower educational heterogamy in online couples. However, such a trend seems to be reinforced by educational hypergamy online in more traditional countries. Hence, I can argue that educational heterogamy of online couples in traditional countries is mainly due to the highly educated men partnering down. It might be easier for such individuals seeking hypergamy in traditional countries to find their desired partner on the internet. Despite the overall results of leading educational hypogamy in cyber-dating, such a union formation might carry negative connotations (Tichenor 2005) even on the internet.

Lastly, the rate of young people living with their parents across populations showed no associations with educational heterogamy. However, when educational hypogamy was considered, the growing number of young adults living with their parents indicates decreasing educational hypogamy. Explanation could lie in the fact that in countries with weak family systems, young adults leave their parents' nest sooner than in countries with stronger intergenerational ties (Reher 1998). Hence, especially highly educated women in countries and regions with weak intergenerational ties might be under pressure to find a partner to start an independent life. They might turn to the internet to find a mate with whom they can start cohabiting for strategic reason. Their educational level preferences could be overpowered by the need to leave their parental home. However, Van den Berg et al. (2021) note that even in countries with weak family systems, economic conditions may result in delayed home leaving.

In my results, the pairing of highly educated women and less educated men seemed to be the main reason behind educational heterogamy in online couples in comparison to offline couples. Nevertheless, educational hypergamy found its place in cyberspace, too. Pop culture has been obsessed with the idea of lovers differing in their social background for years. It seems that the internet might move today's singles closer to such a fantasy. But whose fantasy is it? Since men outnumber women on dating sites (Šetinová, Topinková 2021), the most successful users in cyberspace are potentially women (Potarca 2020) because they "roll the dice." It is up to women who they are going to respond to first. Who are they?

According to previous studies, people who lack time and access when seeking partners offline redirect their efforts to online dating. People who give a chance to cyber-dating are the most "marriage-ready" individuals (Rosenfeld 2017). Potarca (2021) showed that especially highly-educated women are more prone to getting married if they met their partner online than low-educated women; however, in the offline world, the chances are reversed. Nevertheless, both partners' marital plans are important. If a man and a woman agree on the plan to marry, they have the highest probability of marriage. Additionally, a man's socioeconomic characteristic still strongly influences the transition to marriage. Men's tertiary education and working status predict couples' entry to marriage the strongest, whereas woman's education and working status did not matter (Perdoch Sladká 2023)

Therefore, such a prototype of the most successful person on the grounds of dating via the internet would be a woman who, due to her focus on a professional career and high educational attainment, is unable to find suitable partners through traditional means (Potarca 2020; 2021). She is ready for marriage (Rosenfeld 2017) and plans to have a baby in the near future (Potarca 2020). Her preferences lie in a match on marital plans and gender ideology, because she seeks a more egalitarian-minded man (Potarca 2021). Her preferences for shared interests could also be a priority in seeking a partner, to the point that socioeconomic status is not as important (Dutton et al. 2009).

Therefore, if a profession-oriented, highly educated woman wants to get married and seeks a man who is similarly egalitarian-minded and with whom she is going to share similar interests, the internet opens a world full of opportunities. However, if she is looking for a similarly educated partner, she might be unsuccessful and leave the online dating world altogether. If she plans to have a child, she might decide to partner down and modify her preferences.

My results showed an increased probability of 3.7 % of educational heterogamy in online couples compared to offline couples, which does not seem like a big number on paper. However, in the real world, it is 3.7 % of online-turned-offline couples whose educational assortative mating has important implications for their well-being as well as the well-being of the next generations. Educational homogamy causes a high concentration of wealth in one group of society, which is symptomatic of increased inequalities between households. Whereas, the prevalence of heterogamous unions

indicates a possibility for social mobility (Torche 2010; Monaghan 2015). However, a study by Blossfeld et al. (2024) showed that educationally heterogamous couples who decide to have children influence their offspring's chances of becoming tertiary-educated. In comparison to children with educationally homogamous parents, children with heterogamous parents face a smaller likelihood of obtaining a tertiary degree. It is noteworthy that children from educationally hypogamous households are not as disadvantaged as those from hypergamous ones (Blossfeld et al. 2024).

Previous studies also showed that educationally hypogamous marriages are more prone to dissolution, especially in communities where hypogamy was not common (Theunis, 2018). According to Blossfeld (2014), relationships in which women married down were the least stable, educationally homogamous marriages ranked second and the most stable couples were educationally hypergamous. Such non-traditional couples with more educated women are also likely to compensate for their deviation from the gender role norm by performing the traditional division of housework. Women who partner down experience the double burden of being the breadwinner and the homemaker. Children in households broken by divorce face decreased living standards and are at a higher risk of entering poverty than children living with both parents (Bonnet, Solaz 2023).

The presented thesis has also had its fair share of limitations. Firstly, my analysis was of a cross-sectional character. Therefore, educational assortative mating was not studied through time, and I was unable to detect trends in online dating. Secondly, the execution of measuring gender ideology across populations was not ideal due to its limited number of items on the gender-role battery. Thirdly, despite the analysis of 13 populations, the number of countries and territories is still too small to study population-specific variables in great detail. Results were influenced by outliers. Additional outlier analysis would be plausible. The sample was also limited by the age range of couples. Older generations showcase different strategies in online dating and display different assortative mating patterns than younger users (Whyte, Torgler 2017). Lastly, the results of the presented analysis are rich and interesting, but they unfortunately lack in their statistical significance.

Finally, future research could focus on studying educational assortative mating online over time. Combining trace data of first interactions online with survey data of already established relationships would be interesting for understanding motivations, preferences and outcomes of online dating users. However, such an approach would require a longitudinal research design.

A previous trace data study by Skopek et al. (2011) obtained interaction data directly from the dating app provider. Neyt et al. (2019) created fake profiles on Tinder to gather trace data. Such approaches show that obtaining personal data directly from users raises major ethical and privacy concerns. When collecting data of any form (dating apps, social media) from real-life survey respondents, researchers are limited. Social media apps such as Instagram and Facebook do not allow their users to access their

past behaviour history. They might see what posts they liked but they can no longer have access to the content they consumed. There might be an alternative to creating an artificial environment imitating social media or dating apps. Respondents would be presented with content varying in the observed variable, such as marital plans or gender role ideology. The respondent's behaviour in such an environment would be a data unit indicating their preferences.

Despite all its limitations, I hope my thesis sheds light on the differences between couples who met their true love via the internet and couples who went down the traditional way.

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Appendix A Supplementary Material

Table 9: Logit regression models predicting the log-odds of heterogamy.

Variables	Model 1 (Preferred)	Model 2	Model 3
How couples met (ref. = offline)			
online	0.1775***	0.1705***	0.1680***
	(0.0303)	(0.0289)	(0.0347)
Respondent´s education (ref. = ISCED 2)			
ISCED 3 - 4	-0.6116***		-0.5608***
	(0.0581)		(0.0635)
ISCED 5 - 6	-0.6783***		-0.6743***
	(0.0584)		(0.0637)
Partner´s education (ref. = ISCED 2)			
ISCED 3 - 4	-1.1130***		-1.1090***
	(0.0515)		(0.0559)
ISCED 5 - 6	-2.0614***		-2.0966***
	(0.0528)		(0.0572)
Year started cohabiting (ref. = before 2012)			0.0172396
			(0.0254)
Constant	1.4529***	-0.6848***	1.4453***
	(0.0658)	(0.0121)	(0.0725)
Observations	36 872	36 872	32 207
BIC	43937.54	47345.36	44139.2

Table 10: Multinomial logit regression models predicting the relative log-odds of hypergamy and hypogamy vs. homogamy.

	Model 1		Model 2		Model 3	
	hypogamy	**hypergamy**	**hypogamy**	**hypergamy**	**hypogamy**	**hypergamy**
Variables	**(vs. homogamy)**		**(vs. homogamy)**		**(vs. homogamy)**	
How couples met (ref. = offline)						
online	0.1768***	0.1706***	0.1719***	0.1678***	0.1683***	0.1613797**
	(0.0350)	(0.0437)	(0.0333)	(0.0429)	(0.0398)	(0.0505)
Respondent´s Education (ref. = ISCED 2)						
ISCED 3 - 4	-0.4996***	-0.7830***			-0.4853***	-0.6900***
	(0.0662)	(0.0704)			(0.0715)	(0.0782)
ISCED 5 - 6	-0.2705***	-1.3892***			-0.3327***	-1.2967***
	(0.0665)	(0.0728)			(0.0718)	(0.0805)
Partner´s education (ref. = ISCED 2)						
ISCED 3 – 4	-1.2566***	-0.7866***			-1.2449***	-0.7888***
	(0.0545)	(0.0708)			(0.0590)	(0.0768)
ISCED 5 – 6	-2.4777***	-1.2354***			-2.4788***	-1.3162***
	(0.0572)	(0.0729)			(0.0616)	(0.0790)
Year started cohabiting (ref. = before 2012)						
					0.0467	-0.0383
					(0.0293)	(0.0372)
Constant	0.9927***	0.2946***	-1.1051***	-1.7544***	1.0115***	0.2659***
	(0.0712)	(0.0810)	(0.0140)	(0.0182)	(0.0780)	(0.0904)
Observations	36872		36872		32207	
BIC	59575.23		63572.06		60139.2	

Table 11: AMEs of online dating on educational heterogamy across models with all populations.

	Model 1	**Model 2**	**Model 3**
Heterogamy	0.0367***	0.0390***	0.0344***
	(0.0064)	(0.0067)	(0.0345)
Observations	36 872	36 872	32 207

Table 12: AMEs of online dating on educational hypogamy, hypergamy and homogamy across models with all populations.

	Model 1	**Model 2**	**Model 3**	
			2012 and before	**after 2012**
Hypogamy	0.0238***	0.0260***	0.0223**	0.0230***
	(0.0057)	(0.0060)	(0.0064)	(0.0065)
Hypergamy	0.0123***	0.0130**	0.0117**	0.0111**
	(0.0045)	(0.0046)	(0.0053)	(0.0050)
Homogamy	-0.0361**	-0.0390***	-0.0339***	-0.0341***
	(0.0064)	(0.0067)	(0.0072)	(0.0072)
Observations	36 872	36 872	32 207	

Table 13: Linear regression models of AMEs of online dating on educational heterogamy and hypogamy and country-specific variable.

Heterogamy	**Share of tertiary educated**	**Gender ideology**	**Familialism**
Share of tertiary-educated	0.0016*		
	(0.0008)		
Gender ideology		-0.0367	
		(0.0513)	
Familialism			0.0002
			(0.0006)
Constant	-0.0161	0.1525	0.0409
	(0.0299)	(0.1617)	(0.0267)
N	13	13	12
R-square	0.2454	0.0445	0.0067
Hypogamy	**Share of tertiary educated**	**Gender ideology**	**Familialism**
Share of tertiary-educated	0.0008		
	(0.0006)		
Gender ideology		0.0056	
		(0.0344)	
Familialism			-0.0001
			(0.0004)
Constant	-0.0026	0.0063	0.0300
	(0.0217)	(0.1085)	(0.0198)
N	13	13	12
R-square	0.1349	0.0024	0.0061

Table 14: Distribution of control variable across countries and regions.

	Austria	Croatia	Czechia	Den-mark	Estonia	Finland	Ger-many	Hong Kong	Nether-lands	Norway	Sweden	UK	Uru-guay	Total	N
How couples met															
online	15.9%	8.5%	13.8%	19.9%	17.5%	23.0%	17.9%	13.9%	19.2%	14.7%	17.1%	21.4%	11.8%	83.1%	**30648**
offline	84.2%	91.5%	86.2%	80.2%	82.5%	77.0%	82.1%	86.1%	80.8%	85.3%	82.9%	78.6%	88.2%	16.9%	**6224**
Respondent´s Education															
ISCED 2	4.8%	1.9%	11.5%	2.9%	8.5%	1.2%	1.6%	7.4%	5.0%	1.7%	2.8%	1.1%	27.6%	4.5%	**1647**
ISCED 3-4	54.7%	50.2%	34.2%	22.8%	36.1%	27.4%	39.1%	17.0%	30.6%	30.2%	31.8%	38.3%	41.6%	36.4%	**13420**
ISCED 5-8	40.5%	48.0%	54.3%	74.4%	55.4%	71.4%	59.3%	75.6%	64.4%	68.1%	65.5%	60.6%	30.8%	59.1%	**21805**
Partner´s education															
ISCED 2	4.8%	2.0%	20.3%	3.8%	11.8%	2.8%	1.9%	9.5%	6.7%	3.1%	4.9%	2.0%	32.3%	6.1%	**2253**
ISCED 3-4	54.9%	55.7%	36.2%	29.5%	34.7%	34.4%	40.8%	20.7%	34.1%	34.5%	35.2%	45.7%	38.9%	39.4%	**14524**
ISCED 5-8	40.3%	42.3%	43.5%	66.8%	53.6%	62.8%	57.4%	69.8%	59.2%	62.4%	60.0%	52.3%	28.9%	54.5%	**20095**
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		
N	**2726**	**3007**	**2109**	**3441**	**3579**	**1449**	**8670**	**1024**	**2670**	**2147**	**2365**	**2538**	**1147**		**36872**

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