Gender(ed) Segregation?

Gender, Gender-Related Norms, and the Interreligious and Cross-Gender Friendships of Muslim Youth in Germany

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Chapter 1

Introduction

The history of religion's regulation of human behavior is a history of the regulation of *gender*. Religious scripture abounds with elaborations on the appropriate relations between the genders and on the rights and obligations specific to men or women. Interpretation of this scripture, by theologians and laypeople alike, has inspired gender-related religious norms for millennia, and continues to do so (e.g., Ahmed 1992; Heller 2019; Wunder 2019).

Some gender-related norms transcend religious boundaries. Chastity norms are a classic example, with almost all major religions opposing pre- and extramarital sexual activity, frequently vehemently so (Adamczyk & Hayes 2012; Saroglou 2019; Kogan & Weißmann 2020). Other gender-related norms are more specifically linked to certain religious groups. In today's Western societies, a prime example is *veiling*, a practice that has become closely associated with *Muslim women*—even though it also has strong traditions in other religions (Ahmed 1992; Amer 2014). Finally, some gender-related norms prevail across religious groups but vary in their specifics, such as norms on religious endogamy. In most major religions, interreligious romance and intermarriage is discouraged, but there are important differences in how strong this opposition is and who it applies to (Pew Research Center 2016; Sherkat 2004). For example, dominant interpretations of the Qur'an prohibit any intermarriage for Muslim women but allow Muslim men to not only marry Muslim but also Christian and Jewish women, implying a gendered regulation of cross-gender relations (Cila & Lalonde 2014; Clycq 2012).

As these examples highlight, gender-related religious norms frequently concern issues of romance, sexuality, and modesty and, as such, target *social relationships*. This is most obvious for romantic relationships, which many of these norms directly refer to, and which past research shows to be strongly affected by gender-related norms (Clycq 2012; Hawkey et al. 2018; Hennink et al. 1999). However, as other close social relationships, such as friendships, can be facilitators of or steppingstones to romantic relationships, the regulation of social relationships by gender-related religious norms does not necessarily stop

at the threshold of romance. Consider the practice of gender separation in the social lives of men and women prevailing in some Muslim-majority societies (Velayati 2016). Motivated by chastity norms and targeted at preventing sexual temptation, this gender separation does not only regulate romantic relationships, but also prevents other forms of close cross-gender interaction, like cross-gender friendships (Altinyelken 2022; Scourfield et al. 2013).

However, apart from extreme cases of gender segregation like these, the implications gender-related religious norms have for interaction beyond romantic relationships are not well-understood. It is these consequences of gender-related norms that I investigate in this book, asking whether gender-related religious norms not only affect romantic relationships, but also impose constraints on *friendship-making*.

I study this link between gender-related norms and friendships in the German context. This may seem paradoxical at first, as advanced secularization in Western European societies means that gender-related religious norms have lost much of their grip on everyday life in the secular majority (Pew Research Center 2018). Consider only a small selection of indicators: As of 2022, the proportion of Germans who identify as non-religious stands at an all-time-high of 36 percent (Müke et al. 2023). While half of the population still formally identifies as Christian, only 15 percent of them attend religious service regularly and less than half strongly believe in the existence of God (El-Menouar 2022; Müke et al. 2023). In opposition to traditional Christian dogma, premarital sex and cohabitation are widely accepted and practiced (Fulda 2017; Widmer et al. 1998; Scharmanski & Heßling 2021) and religiously motivated traditional conceptions of gender roles are increasingly rejected (Lois 2020; Röhr-Sendlmeier et al. 2018). All this points to a minor role of gender-related religious norms for social relationships both in the German context and in Western Europe more generally, which tends to be characterized by similar developments (Pew Research Center 2018).

Against this trend of secularization, however, the maintenance and influence of gender-related religious norms in religious minorities has become ever more visible. In Western Europe, most discussions concern *Muslims*, who make up both the largest religious minority in most countries (Pew Research Center 2017) and display persistently high levels of religiosity (Jacob & Kalter 2013; Voas & Fleischmann 2012). Debates on gender-related norms are particular fierce on the topic of female veiling (Choi et al. 2023; Helbling 2014), which many non-Muslims perceive as a symbol of both Muslim otherness and female oppression (Choi et al. 2023), though most Muslim women disagree with this interpretation (Abo-Zena 2019; Haug et al. 2009). Other discussions concern the more traditional gender role attitudes Western Muslims tend to hold (Diehl et al. 2009; Glas 2023; Röder & Mühlau 2014) or disagreements on customs of

cross-gender interaction, like the refusal of some Muslims to shake hands with members of the other gender due to prohibitions of physical contact (Fadil 2009; Ivarsflaten et al. 2022; Orgad 2021).

As these examples show, gender and gender-related religious norms have become a key arena of conflict between Muslims and the majority of secular non-Muslims in the West (Choi et al. 2023; Sniderman & Hagendoorn 2009). Accordingly, they contribute to the bright social boundary between Muslims and non-Muslims that researchers attest to many Western societies (Drouhot & Nee 2019; Foner & Alba 2018). This boundary is most clearly reflected in limited close social interaction between Muslims and non-Muslims, both in terms of romantic relationships (e.g. Carol 2016a; Mood & Jonsson 2022; van Zantvliet et al. 2015) and friendships (e.g. Leszczensky & Pink 2017; Simsek et al. 2022; Windzio & Wingens 2014).

On the side of non-Muslim Westerners, skepticism towards gender-related norms can feed into stereotypes and negative attitudes towards Muslims (e.g. Erentzen et al. 2022; Verkuyten 2021), reducing their openness to interreligious contact.

More directly, however, gender-related norms constrain the social relationships of Western Muslims *themselves*. As discussed above, this is particularly likely for romantic relationships, which many gender-related norms target directly. This holds true in particular for the two norms I am concerned with in this book: *endogamy norms*, which oppose interreligious romance, and *chastity norms*, which prohibit premarital sexuality. These norms are widespread among Muslims in the West, particularly when compared to the secular Western majority (Kalmijn & Kraaykamp 2018; Kogan & Weißmann 2020; Van Pottelberge et al. 2019). Both norms are also gendered, opposing interreligious romance and premarital sexuality more strongly for female than male Muslims (Carol & Teney 2015; Cila & Lalonde 2014; Hennink et al. 1999).

Consequences of gendered endogamy and chastity norms for *romantic relationships* are well-established. While romantic relationships between Muslims and non-Muslims are rare in general, gendered endogamy norms ensure that interreligious dating and intermarriage is even less frequent among female than among male Muslims (Mood & Jonsson 2022; Qvist & Qvist 2023; Van Pottelberge et al. 2021; Wachter & de Valk 2020; van Zantvliet et al. 2015). Similarly, due to chastity norms, Muslim youth—and Muslim girls, specifically—less frequently engage in romantic relationships and premarital sexuality than their non-Muslim majority peers (de Graaf et al. 2017; Wong et al. 2017; Yahyaoui et al. 2013; Yip & Page 2016).

Being well-established in the literature, the impact of gender-related religious norms on the *romantic relationships* of Western Muslims is nothing I intend

to reheat in this book. What we do not know so far, however, is whether gendered endogamy and chastity norms also have consequences beyond romantic relationships, therefore affecting the social interaction of Western Muslims more generally. This is the question I address in this book. To answer this question, I deviate from the well-worn path of studying Western Muslims' romantic relationships, and instead ask how gendered endogamy and chastity norms affect their *friendship-making*. I concentrate on the friendships of Muslim *youth*, who are the main targets of endogamy and chastity norms as they pass through adolescence and become increasingly interested in romantic relationships (Collins et al. 2009; Hendrickx et al. 2002)

Throughout this book, I raise two main questions on the consequences of gender-related norms for Muslim youths' friendship-making. First, with the constraints gendered endogamy norms impose on Muslim girls' intergroup dating well-established, I ask whether, due to *endogamy norms*, Muslim girls also engage less in *interreligious friendship-making* than Muslim boys. Second, with the literature showing Muslim youth to be less involved in premarital sexuality and romance than non-Muslim youth, I ask whether, due to *chastity norms*, Muslim youth also engage less in *cross-gender friendships* than non-Muslim youth.

Before I discuss these questions in more detail and outline my strategy for addressing them, I start by highlighting the importance of answering these questions.

1.1 Motivation: Why Study the Role of Gender-Related Religious Norms in Western Muslim Youths' Friendship-Making?

Why is it important to study how gender-related norms shape the interreligious and cross-gender friendships of Muslim youth in the West? This question can be broken down into four sub-questions: Why is it important to study *young Muslims in the West*? Why is it important to study *interreligious friendships*? Why is it important to study *cross-gender friendships*? And, finally, why is it important to study the *contribution of gender-related norms* to these friendships?

1.1.1 Why Study Muslim Youth in the West?

In recent decades, Muslims have become the largest religious minority in most Western countries. Taking Germany as a case in point, more than 5 million of the German population of 81 million identify as Muslim as of 2019 (Pfündel et al. 2020), a population proportion of about 6 percent. This makes Muslims

the largest religious minority in Germany by a substantial margin (Müke et al. 2023). By 2050, the population proportion of Muslims in Germany is projected to increase to a minimum of 9 percent, even if migration came to a complete halt; scenarios that assume continuing migration from Muslim-majority countries predict a population proportion of Muslims in the range of 11 to 20 percent by 2050 (Pew Research Center 2017). Among German youth, the proportion of Muslims stands at 10 percent today already (Foroutan et al. 2015). Similar patterns and trends also characterize many other Western European countries (Pew Research Center 2017), showing that, clearly, Muslims in the West have come to stay.

Western Muslims remain disadvantaged in terms of their structural integration into the labor market and educational system, compared both to the Western majority and to other minorities (Foner & Alba 2018). Social inequalities are a major driver of these disadvantages, but evidence of a discrimination of Muslims *qua* their being Muslims is mounting, as well (e.g. Di Stasio et al. 2021; Fernández-Reino et al. 2022; Koopmans et al. 2019). This resonates with the observation that the distinction between Muslims and non-Muslims has become a bright boundary in Western societies (Drouhot & Nee 2019; Foner & Alba 2018; Statham & Tillie 2016).

Given accumulating evidence of this boundary, studying the social relationships of Muslim *youth* is particularly important. The intergroup relations people engage in during adolescence affect their stereotypes and intergroup attitudes well into adult life (Stearns et al. 2009; Wölfer et al. 2016). Therefore, the nature of interreligious relations among youth today determines what the boundary between Muslims and non-Muslims will look like tomorrow.

In the context of gender-related norms, studying Muslim *youth* is also important because adolescence is a period of life in which young Muslims become increasingly confronted with gender-related norms and regulations (Basit 1997a; Scourfield et al. 2013; Shah & Conchar 2009). After the onset of puberty, many adolescents—Muslim and non-Muslim alike—become interested in romantic relationships (Collins et al. 2009), which makes gender-related religious norms increasingly salient. Adolescence is also a time in which Muslim youth are confronted with both the norms their parents and religious communities hold and those prevalent in the secular majority, which they are continuously exposed to in the context of Western schools. Frequently, these norms diverge, raising the question of how Muslim youth engage in social relationships in the face of different, and sometimes diametrically opposed, expectations (Altinyelken 2022; Seward & Khan 2016; Zine 2001).

Accordingly, studying Muslim youth and their friendships is important to understand both the development of religious boundaries in Western societies

and the impact of the normative influences they are exposed to particularly in this period of life.

1.1.2 Why Study the Interreligious Friendships of Muslim Youth?

Even though increasingly diverse Western schools provide adolescents with opportunities for interreligious friendship-making, religious segregation in friendship networks persists: Consistently, recent research documents that friendships between Muslims and non-Muslims are rarer than expected based on adolescents' opportunities for interreligious interaction (Leszczensky & Pink 2017; Simsek et al. 2022; Snijders & Kalter 2020; Windzio & Wingens 2014). This observation does not merely reflect established patterns of segregation according to ethnic or socioeconomic background either (e.g. Goodreau et al. 2009; Leszczensky & Pink 2015; Malacarne 2017; Smith et al. 2014): Even after accounting for other sources of segregation, friendships between Muslim and non-Muslim youth remain limited (Leszczensky & Pink 2017; Simsek et al. 2022; Windzio & Wingens 2014). There are at least two key reasons why understanding the extent of and mechanisms behind religious segregation and interreligious friendship-making between Muslim and non-Muslim youth is important.

First, interreligious friendships can improve the *intergroup attitudes* Muslims and non-Muslims hold about one another. The positive effect of intergroup contact on intergroup attitudes is among the best-established regularities in social science research, and this effect is particularly strong for intergroup friendships (Davies et al. 2011; Pettigrew & Tropp 2006). Conversely, a lack of intergroup friendships can allow prejudice and stereotypes to persist (Zafar & Ross 2015). In line with the bright boundary documented between Muslims and non-Muslims in the West, negative attitudes towards and stereotypical conceptions of Muslims are observed among many Western non-Muslims (Erentzen et al. 2022; Sides & Gross 2013; Verkuyten 2021). They are not restricted to adults either, but also extend to non-Muslim youth (Vedder et al. 2016; Velasco González et al. 2008; Verkuyten 2007; Verkuyten & Thijs 2010). Reversedly, a sizable proportion of Western Muslim youth also hold attitudes critical of the non-Muslim majority (Verkuyten 2007; Verkuyten & Thijs 2010). In the face of widespread prejudice and stereotypes, friendships between Muslim and non-Muslim youth that help to improve intergroup attitudes are even more important than intergroup contact is in other contexts.

Second, the *social integration* of Muslims in terms of their interreligious friendships can facilitate their integration into Western societies in other domains. This holds true particularly for friendships with peers that belong to the Western majority and tend to be well-acquainted with Western mainstream institutions.

These majority friends can provide information on the educational system (Kornienko & Rivas-Drake 2022) that is lacking in some Muslim immigrant-origin families (Kretschmer 2019; Kristen 2008), thus supporting their Muslim friends' educational trajectories. In a similar vein, close ties to majority peers can improve minority success in the labor market (Kalter 2006; Koopmans 2016; Lancee 2010). Accordingly, social integration can also benefit Muslim youths' structural integration. At the same time, benefits from friendships with majority peers are not limited to structural integration. For example, interreligious peers can also facilitate language acquisition by providing regular exposure to native speakers (Chiswick & Miller 2001; Moyer 2008). While language acquisition is not an issue for many of the young Muslims born and raised in the West, it is a pressing concern among refugees and other immigrants that have entered Western countries only recently, many of whom also originate from Muslim-majority countries (Pew Research Center 2017). Finally, majority friends have been linked to the adoption of dominant cultural attitudes prevailing in Western countries, such as more egalitarian gender role attitudes (Kretschmer 2018; Maliepaard & Alba 2016; Ng 2022b). As much of the discussion on cultural differences between Muslims and non-Muslims surrounds issues of gender and gender equality (Choi et al. 2023; Moss et al. 2019; Sniderman & Hagendoorn 2009), interreligious friendships also have the potential for supporting cultural integration and reducing conflict on these issues.

1.1.3 Why Study the Cross-Gender Friendships of Muslim Youth?

Compared to same-gender friendships, cross-gender friendships are rare in all phases of life (Mehta & Strough 2009). However, they become more common in the adolescent years (Maccoby 1998; Mehta & Strough 2009; Poulin & Pedersen 2007) and are connected to various developmental benefits.

In cross-gender friendships, adolescents learn an interactional and conversational style that allows rewarding interaction across gender boundaries (McDougall & Hymel 2007). In highly gender-integrated Western societies, this is essential preparation for adult life, as higher education, workplaces, and leisure contexts are usually gender-mixed (Maccoby 1998; Mehta & Strough 2009; Sippola 1999). Besides casual everyday cross-gender interaction, cross-gender friendships also prepare adolescents for romantic relationships and improve the quality of these more intimate relations (Mehta & Strough 2009; Sippola 1999).

At the same time, cross-gender friendships are an important corrective to same-gender friendships, which tend to foster gendered interests and gender stereotypes (Leaper 1994; McHale et al. 2004; Mehta & Strough 2009; Sippola 1999). Therefore, past research has suggested that cross-gender friendships may

facilitate a breakdown of sexist attitudes (Jenkins et al. 2023; Keener et al. 2013) and induce more egalitarian gender role attitudes (Bryant 2003; Sippola 1999), particularly among boys and young men.

Against this backdrop, cross-gender friendships are also likely to be of specific importance to *Muslim* youth. Gender roles and gender relations become increasingly contested within Western communities as the conservative gender role attitudes of many first-generation immigrants are superseded by a broader diversity of traditional and egalitarian attitudes among Western-born Muslims (Glas 2023; Röder & Mühlau 2014). Given the reevaluation of gender roles that comes with this process, the breakdown of gender stereotypes and the perspective-taking associated with cross-gender friendships are likely to be particularly helpful to support a successful transition. Furthermore, if cross-gender friendships are indeed associated with more egalitarian gender role attitudes, they can further Muslim youths' cultural integration and reduce conflict with the non-Muslim majority. Therefore, cross-gender friendships can be important both for (cross-gender) relations *within* Muslim communities and for relations *between* Muslims and non-Muslims in the West.

1.1.4 Why Study the Role of Gender-Related Norms in Muslim Youths' Friendship-Making?

While the prevalence of gendered endogamy and chastity norms among Western Muslim youth is well-established, we know little about their consequences for friendship-making. However, understanding the potential implications of gender-related norms for intergroup friendships is important for at least two main reasons.

First, comparing the extent to which gender-related norms constrain intergroup friendship-making with other inhibitors of close intergroup contact can provide important insights into how tense and contested group boundaries are. Consider interreligious friendships and gendered endogamy norms as an example: If strong endogamy norms constrain Muslim girls' interreligious friendships, this interference most likely reflects that Muslim girls, their parents, or their religious community see a risk of these friendships evolving into romantic relationships (Hennink et al. 1999; Scourfield et al. 2013). What these norms do not suggest, is negative attitudes towards or even a fundamental rejection of non-Muslims (Basit 1997a; Talbani & Hasanali 2000). If, by contrast, Muslim girls engaged in in-group friendships primarily because of rejection and discrimination by non-Muslims, this would suggest much more tense intergroup relations. Of course, a lack of interreligious friendships is a missed opportunity for improving intergroup attitudes and facilitating Muslim integration in both

scenarios. Still, the extent to which limited intergroup friendships are indicative of a conflictual group boundary differs markedly between both situations.

In a similar vein, the boundary between adolescent boys and girls has very different connotations in a scenario in which some youth consider close cross-gender interaction inappropriate due to chastity norms (Giuliani et al. 2017; Grønli Rosten & Smette 2023), and a scenario in which sexist attitudes create a highly conflictual atmosphere between boys and girls. To judge the meaning of limited intergroup friendships appropriately, it is thus important to understand whether they are driven by norms or by other processes.

Second, a focus on specific gender-related religious norms helps to provide both a more complete and a more nuanced view on the role religion and religiosity play for intergroup relations. This is important in particular with respect to recent studies on religious friendship segregation, which find limited friendship-making between Muslim and non-Muslim youth but no clear-cut variation by religiosity (Leszczensky & Pink 2017, 2020). This suggests that a more differentiated perspective on the different components of religiosity and their potentially conditional impact is necessary to capture the consequences of religion for intergroup relations. Studying specific religious norms and providing an assessment that accounts for the different implications these norms can have for boys and girls, I move towards this more nuanced perspective on religion and religiosity throughout this book.

1.2 Established Findings, Unknowns, and Research Questions

1.2.1 Interreligious Friendships

In the last decade, friendships between Muslim and non-Muslim youth in Western societies have increasingly received scholarly attention. This research documents a social boundary between Muslims and non-Muslims (Drouhot & Nee 2019): As highlighted above, previous studies have consistently documented that friendships between Muslims and non-Muslims are rarer than expected given the ample opportunities for interreligious contact diverse Western schools provide many adolescents (Leszczensky & Kretschmer 2022; Leszczensky & Pink 2017, 2020; Snijders & Kalter 2020; Windzio & Wingens 2014). In addition, analyses that break down religious friendship segregation into the individual behaviors underlying it demonstrate that segregation is the joint consequences of both Muslims and non-Muslims being hesitant to engage in out-group friendships (Leszczensky & Kretschmer 2022; Leszczensky & Pink 2017; Windzio & Wingens 2014).

With this overall pattern of religious friendship segregation established in the literature only recently, research on heterogeneity in interreligious friendship-making is still in its infancy (Leszczensky & Pink 2017, 2020). In particular, research has so far been silent on the role gender plays in interreligious friendship-making between Muslim and non-Muslim youth, even though gendered patterns are highly visible in romantic relationships. As discussed above, interreligious dating and intermarriage are notably less frequent among Muslim girls and women than Muslim boys and men (Carol 2016a; Mood & Jonsson 2022; Qvist & Qvist 2023; Van Pottelberge et al. 2021; Wachter & de Valk 2020; van Zantvliet et al. 2015). This gender difference is usually attributed to endogamy norms that more strongly oppose the interreligious romantic relationships of female than of male Muslims (Clycq 2012; Munniksma et al. 2012; Cila & Lalonde 2014).

However, the consequences of endogamy norms may not be limited to romantic relationships. After all, strong endogamy norms tend to be associated with both parental control of social interaction and some tentativeness towards interreligious contact among Muslim girls themselves (Carol & Teney 2015; Hennink et al. 1999; Scourfield et al. 2013). Therefore, the question arises whether gendered endogamy norms may not only constrain Muslim girls' romantic relationships, but also interfere with their *interreligious friendship-making*. Since neither gender-specific patterns of friendship-making nor the contribution of endogamy norms to them have been assessed so far, the first research question this book addresses is:

Research Question 1:
Do Muslim girls engage less in interreligious friendship-making than Muslim boys, and is this due to gendered endogamy norms?

Interreligious friendship-making is not a one-way-street, though. Rather than depending on the (gendered) behavior of Muslim youth only, it is also contingent on the openness of non-Muslims towards Muslim friends. Accordingly, fully understanding *gendered* patterns of interreligious friendship-making also presupposes an assessment of gendered friendship-making among non-Muslims. After all, if non-Muslims are particularly hesitant to engage in friendships with Muslim girls, these experiences or expectations of rejection may also lead Muslim girls to primarily make friends with the in-group. Gendered friendship-making among non-Muslims may thus provide an alternative to the explanation of Muslim girls' focus on the in-group due to endogamy norms.

And indeed, with some Muslim girls beginning to veil in adolescence (Abo-Zena 2019; Haug et al. 2009) and the veil being a prime symbol of Muslim otherness (Chakraborti & Zempi 2012; Choi et al. 2023), there is reason to

expect that at least some Muslim girls face a reluctance of non-Muslims to become friends with them in adolescence. At the same time, however, a growing literature documents the specific and highly negative stereotypes non-Muslims hold about *male* rather than female Muslims (Archer 2009; Erentzen et al. 2022; Fourgassie et al. 2023). Again, some of these stereotypes are connected to veiling: Just as many Western non-Muslims consider veiling as a symbol of female oppression (Abo-Zena 2019; Choi et al. 2023), they consider Muslim men as the instigators of this oppression (Erentzen et al. 2022; Clycq 2012). Other stereotypes concern the perception of male but not female Muslims as dangerous, unlawful, and "anti-social" (Erentzen et al. 2022; Fourgassie et al. 2023). If these strong and negative stereotypes also apply to Muslim youth, non-Muslims may also be skeptical of engaging in friendships with Muslim *boys* rather than Muslim girls. Given these competing mechanisms, I ask

Research Question 2:
Do non-Muslims differ in their reluctance to befriend Muslim boys and Muslim girls?

Answering this question is essential to differentiate whether a lower involvement of Muslim girls in interreligious friendships originates from their own focus on the in-group or the rejection they (fear to) experience from non-Muslims.[1]

1.2.2 Cross-Gender Friendships

From past research, we know that Muslim youth face specific challenges to cross-gender friendships in at least some of the contexts they spend time in. Traditionally, activities in Muslim religious communities have been gender-segregated, a practice that also characterizes most Muslim communities in the West (Altinyelken 2022; Scourfield et al. 2013). During religious activities, most Muslim youth therefore necessarily have limited opportunities for cross-gender friendship-making. Frequently, gender segregation in religious activities is motivated by strong *chastity norms* among both parents and in the religious community more broadly (Altinyelken 2022; Shah & Conchar 2009). Accordingly, the separation of Muslim boys and girls serves the goal of preventing sexual temptation and the risk of teenage dating and sexual activity (Altinyelken 2022; Williams et al. 2017).

[1] As this book is primarily concerned with the patterns and driving forces of *Muslim* youths' friendship-making, I do not empirically investigate the specific potential mechanisms behind differences in *non-Muslims'* openness to friendships with Muslim boys and Muslim girls. However, I return to this issue, which is a key question for future research, in the general discussion in Chapter 7.

In line with these restrictions, the few previous studies explicitly concerned with Muslim youths' cross-gender friendship-making find that Muslim adolescents primarily have same-gender friends, while cross-gender friendships are rare (Basit 1997a; Hennink et al. 1999; McGrath & McGarry 2014; Sarroub 2010). However, none of these studies clarifies whether these patterns merely reflect a lack of opportunities for cross-gender friendship-making among Muslim youth or an individual hesitancy due to strong chastity norms.

From past research, we know that chastity norms continue to exert influence on the *romantic relationships* of Western Muslim youth. Muslim adolescents in general, and Muslim girls specifically, engage in romantic relationships and premarital sexuality less frequently than non-Muslim youth (de Graaf et al. 2017; Wong et al. 2017; Yahyaoui et al. 2013; Yip & Page 2016). However, as in the case of endogamy norms, we do not know whether the effects of chastity norms also extend to cross-gender *friendships*. Given the structural constraints to cross-gender interaction most Muslim youth face in their religious communities, assessing this question requires studying cross-gender friendship-making in a context that, at least, provides Muslim youth with *opportunities* for close cross-gender interaction. To study cross-gender friendships and chastity norms among Muslim youth, I thus investigate friendship-making in Western coeducational schools. In this context, which provides both Muslim and non-Muslim youth with ample opportunities for close cross-gender interaction, I ask

Research Question 3:
Do Muslim youth engage less in cross-gender friendships than non-Muslim youth, and is this due to chastity norms?

Again, answering this question requires a perspective that is both gender-specific and accounts for various sources of norms. Like endogamy norms, chastity norms are stronger for Muslim girls (Cense 2014; Hawkey et al. 2018) and, more than Muslim youth themselves, their parents tend to see close cross-gender interaction as a general risk, even if interaction is platonic (Grønli Rosten & Smette 2023; Talbani & Hasanali 2000).

In stark contrast to interreligious and interethnic friendships (Davies et al. 2011), cross-gender friendships have received little attention in the literature on the integration of Muslims—and minorities in general—into Western societies. To change this and to highlight the connection between cross-gender friendships and minority integration, I devote the last part of this book to the question of whether cross-gender friendships affect Muslim cultural integration. More specifically, I investigate whether cross-gender friendships induce more egalitarian *gender role attitudes*. The more traditional gender role attitudes that Muslims tend to hold are a key arena of conflict in Western societies (Choi et al.

2023; Moss et al. 2019; Sniderman & Hagendoorn 2009), so gender role attitudes are particularly relevant to Muslim cultural integration.

The idea that cross-gender friendships may induce more egalitarian gender role attitudes has repeatedly surfaced in both the literature on cross-gender interaction (Maccoby 1998; Sippola 1999) and gender role attitudes (Halimi et al. 2021; McHale et al. 2004). If correct, this link would suggest that constraints to Muslim youths' cross-gender friendships imposed by chastity norms indirectly support the persistence of traditional gender role attitudes among Western Muslims, thus limiting their cultural integration. However, claims about the link between cross-gender friendships and gender role attitude in past research either rest on theoretical reasoning alone (Maccoby 1998; Sippola 1999) or on empirical data not suitable for identifying cross-gender friends' influence, as the authors readily acknowledge (e.g., Bryant 2003; Perez-Brena et al. 2015). Given this gap in the literature, I ask

Research Question 4:
Do cross-gender friendships induce more
egalitarian gender role attitudes among Muslim youth?

With this assessment, I both highlight the indirect consequences of chastity norms and establish whether cross-gender friendships are relevant for minority cultural integration.

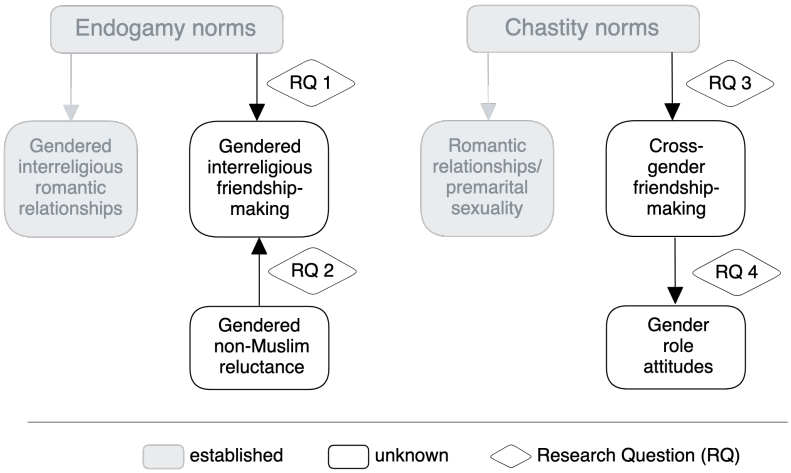
1.2.3 Summary of Research Questions

In Figure 1.1, I sum up the key questions I address throughout this book. Shaded boxes and arrows illustrate the established starting points of my research. Whites boxes with black edging and black arrows refer to patterns and processes unknown so far. Diamond shapes represent the four research questions these unknown factors raise.

From past research, we know that both gendered endogamy norms and chastity norms are more widespread among Western Muslims than in the non-Muslim majority. We also know how these norms affect Western Muslims' *romantic relationships*: Due to gendered endogamy norms, Muslim girls engage in interreligious romance less frequently than Muslim boys. Due to chastity norms, Muslim youth have fewer romantic relationships and engage less frequently in sexual activity than their non-Muslim peers, a pattern that is particularly strong for Muslim girls.

However, we do not yet know whether gendered endogamy norms also result in *gendered interreligious friendship-making*, inducing a stronger focus on in-group friendships among Muslim girls than among Muslim boys (RQ 1). In a

Figure 1.1: Norms, Romantic Relationships, and Friendships of Muslim Youth: An Overview of Key Research Questions



similar vein, we do not know whether the friendship-making of non-Muslims is gendered, i.e., whether non-Muslims differ in how reluctant they are towards friendships with Muslim boys and Muslim girls (RQ 2).

The consequences of Muslim youths' chastity norms on *cross-gender friendships* have not been systematically assessed so far either (RQ 3). Finally, while links between cross-gender friendships and egalitarian gender role attitudes have been suggested in past research, these expectations still await rigorous empirical tests. To assess whether a lack of cross-gender friendships limits Muslim youths' cultural integration into Western societies, I thus also investigate whether cross-gender friendships in fact influence the gender role attitudes of Muslim youth (RQ 4).

My focus on endogamy norms and interreligious friendships on the one hand, and chastity norms and cross-gender friendships on the other, naturally splits this book into two parts. In the first part, I investigate gendered interreligious friendship-making and the role gendered endogamy norms play in it. In the second part, I study how cross-gender friendship-making differs between Muslim and non-Muslim youth, whether differences are due to chastity norms, and whether cross-gender friendships shape the gender role attitudes of Muslim boys and girls.

1.3 A Guide to the Chapters

1.3.1 Part I: Interreligious Friendship-Making

I discuss the interreligious friendship-making of Muslim boys and girls in Chapters 2-4 of this book. Jointly, these chapters document gender differences in *patterns and trends* of interreligious friendship-making, as well as evidence on the *mechanisms* behind these patterns.

Chapter 2 provides a framework for investigating gendered processes of religious friendship-making. It conceptualizes religious friendship segregation as a two-sided process, highlighting that segregation can result both from a *Muslim in-group bias* and a *reluctance of non-Muslims* to make friends with Muslims. Synthesizing arguments and findings from the literature on gendered intergroup romantic relationships and gendered stereotypes, I argue that both Muslim in-group bias and non-Muslim reluctance are likely to be gendered. I test these expectations with two waves of German large-scale survey data and a social network analysis based on multilevel random-coefficients stochastic actor-oriented models. I find a stronger in-group bias among Muslim *girls* than boys, and a stronger reluctance of Muslims to befriend Muslim boys than Muslim girls. I conclude the chapter by demonstrating how this individual-level friendship-making behavior translates into the religious friendship segregation experienced by Muslim boys and girls, respectively.

In *Chapter 3*, I extend the static assessment of religious friendship segregation from Chapter 2 by considering dynamics of friendship-making across the adolescent years. This dynamic conceptualization of religious friendship segregation does not only establish when in adolescence Muslims' gendered in-group bias and non-Muslims' reluctance are likely to be particularly strong. It also provides indirect evidence of the mechanisms behind gendered friendship-making, as different mechanisms predict different developmental trajectories. To investigate dynamic interreligious friendship-making, I rely on six waves of longitudinal data on Muslim and non-Muslim youth throughout adolescence, analyzed with both stochastic actor-oriented and fixed-effects growth curve models. The results show that Muslim girls' in-group bias rises substantially as adolescence progresses, while both Muslim boys' in-group bias and non-Muslim youths' reluctance towards interreligious friendships remain stable throughout adolescence.

Accordingly, Chapters 2 and 3 both document a substantial gender gap in Muslim in-group bias, with Muslim girls increasingly focusing on in-group friendships in adolescence. This is consistent with the expectation that gendered

endogamy norms not only constrain Muslim girls' intergroup romantic relationships, but also their interreligious friendships. At the same time, there is no evidence to suggest that non-Muslims are more reluctant to befriend Muslim girls than boys, eliminating this alternative explanation.

Based on these findings, *Chapter 4* aims to collect more direct evidence on the role gendered endogamy norms play in producing the gender gap in interreligious friendship-making. In a first developmental study, I consider three factors related to gendered endogamy norms which the literature on intergroup dating has found to constrain Muslim girls' interreligious romantic relationships: religiosity, parental control, and leisure time activities. Using random-effects growth curve models to trace Muslim boys' and girls' religious friendship-making throughout adolescence, I show that both the gender-specific development and the gender-specific effects of these factors contribute to the emerging gender gap in friendship-making. As these factors are closely related to gendered endogamy norms, this finding lends further credibility to the influence these norms exert on interreligious friendship-making.

In a second, cross-sectional study, I more directly assess the influence of endogamy norms as well as competing explanations for the gender gap in interreligious friendship-making. With linear probability models and mediation analysis, I show that gendered endogamy norms emerge as the strongest and most consistent factor contributing to the gender gap in Muslim youths' interreligious friendships. There is tentative evidence that both Muslim youths' own and their parents' endogamy norms influence in-group friendship-making.

Across four studies in three chapters, both indirect and direct evidence thus suggest that the strong endogamy norms Muslim girls face do not only constrain their intergroup dating, but also their interreligious friendship-making.

1.3.2 Part II: Cross-Gender Friendship-Making

Having established gender-specific patterns of interreligious friendship-making and the role gendered endogamy norms play in shaping them, *Chapters 5* and *6* turn to Muslim youths' *cross-gender friendships*, whether chastity norms constrain them, and whether they have implications for Muslim youths' cultural integration.

In *Chapter 5*, I first differentiate the different contexts in which Muslim youth can establish cross-gender friendships, consider the constraints they face to cross-gender friendship-making, and discuss whose chastity norms may prove relevant for cross-gender interaction under which conditions. I then focus on friendship-making in Western coeducational schools, which provide Muslim youth with ample opportunities for cross-gender interaction. Applying

multilevel exponential random graph models to large-scale network survey data, I show that, despite these opportunities, Muslim youth engage less in cross-gender friendships than their non-Muslim peers. This difference, however, is fully accounted for by Muslim youths' own chastity norms, attesting to their relevance beyond the regulation of romantic relationships.

Chapter 6 turns to the consequences this lack of cross-gender friendships has for Muslim youths' gender role attitudes. I first distinguish the different mechanisms through which cross-gender friends can affect gender role attitudes, how they vary by gender, and which specific considerations apply to Muslim youth. Then, I employ stochastic actor-oriented models and a large-scale sample of Muslim and non-Muslim youth in Germany to empirically assess the influence of cross-gender friends on gender role attitudes. I find that cross-gender friendships lead to an adoption of more egalitarian gender role attitudes among boys. This influence is particularly strong among Muslim boys, while the gender role attitudes of both Muslim and non-Muslim girls are invariant to friends' gender. Accordingly, these findings hint at the relevance of cross-gender friends for the cultural integration of Muslim youth into Western societies. While cross-gender friends induce substantially more egalitarian gender role attitudes among Muslim boys, Chapter 5 documents these friendships to be rare, implying that Muslim boys seldomly accrue the integration benefits they provide.

Chapter 7 briefly summarizes the five substantive chapters, carves out the main substantive insights, and highlights open questions and directions for future research.

Part I

Interreligious Friendship-Making

Chapter 2

Gendered Interreligious Friendship-Making among Muslim and Non-Muslim Youth and the Creation of Religious Friendship Segregation

A different version of this chapter, co-authored with Lars Leszczensky, has been published in *Social Forces* (Kretschmer & Leszczensky 2022). For reasons of consistency, I have rewritten the chapter from a first-person perspective and have made both linguistic and substantive changes.

Abstract

Even in diverse schools that provide opportunities for interreligious friendships, Muslim youth disproportionally tend to be friends with Muslims rather than non-Muslims. From earlier research, we know that this religious friendship segregation can arise both because of Muslims' in-group bias and because of non-Muslims' reluctance towards friendships with their Muslim peers. In this chapter, I ask whether these individual-level processes behind religious friendship segregation are *gendered* and therefore differ between Muslim boys and girls. Building on research on interreligious romantic relationships and the strong endogamy norms Muslim girls face, I propose in-group bias to be stronger among Muslim girls than boys. Based on research documenting the strong and highly negative stereotypes non-Muslims hold about Muslim boys, as well as a stronger aversion against minority men than women more generally, I expect non-Muslims to be more reluctant towards friendships with Muslim boys than girls.

Applying stochastic actor-oriented models of network dynamics to large-scale longitudinal data of friendship networks in German schools, I find that Muslim girls indeed have a strong in-group bias, whereas non-Muslim youth are comparably open to friendships with them. Muslim boys, by contrast, have a much weaker in-group bias, but non-Muslim youth are notably less willing to be friends with them rather than with non-Muslims.

A simulation analysis demonstrates that these gendered individual-level processes result in comparable aggregate patterns of segregation in the reciprocated friendships of Muslim boys and girls. Religious friendship segregation is thus similar for both Muslim boys and girls but arises for very different reasons. While Muslim girls tend to self-segregate, Muslim boys—who themselves are more open to interreligious friendships—face reluctance from non-Muslims. This highlights strongly gendered processes of interreligious friendship-making among Muslim and non-Muslim youth.

2.1 Introduction

Religion occupies the center stage in debates on immigration in Western societies, most often focusing on the divide between Muslims and non-Muslims (Drouhot & Nee 2019; Voas & Fleischmann 2012). Muslims face substantial negative sentiment in the West (Bozorgmehr & Ketcham 2018; Foner & Alba 2008, 2018; Strabac & Listhaug 2008), and public discourse frequently suggests that many Muslims themselves refuse to culturally and socially integrate into Western societies (see Crozier & Davies 2008; Norris & Inglehart 2012). In these debates, actual and perceived points of contention revolve around attitudes towards democracy, gender equality, and homosexuality (e.g. Choi et al. 2022; Kretschmer 2018; Maliepaard & Alba 2016; Sniderman & Hagendoorn 2009). At the same time, Muslims in Europe identify less strongly with their nations than non-Muslims (Maxwell & Bleich 2014; Leszczensky et al. 2020b) and have fewer non-Muslim friends (Maliepaard & Phalet 2012).

In many European societies, religion has therefore become a bright boundary between the secular Christian majority and Muslim minority, and there is rising concern about the cultural and social integration of young Muslims (Bozorgmehr & Ketcham 2018; Foner & Alba 2018). Accordingly, Drouhot & Nee (2019, 12) recently noted that religion has become "a key relational divide in Western Europe, contributing to segregation dynamics."

This segregation is most visible in religiously diverse Western schools, where, despite opportunities to mingle, Muslim youth tend to disproportionally be friends with Muslim rather than non-Muslim peers (Leszczensky & Pink 2017; Windzio & Wingens 2014). Echoing broader debates about minority self-segregation versus exclusion by majority group members (Crozier & Davies 2008; Sniderman & Hagendoorn 2009; Vincent et al. 2017), a particularly important question is how the behavior of Muslims and non-Muslims each contributes to such religious friendship segregation. Do Muslim youth flock together because of a pronounced in-group bias? Or are non-Muslim youth reluctant to be friends with their Muslim peers, thus making it difficult for Muslims to befriend non-Muslims? Of course, these pathways are not mutually exclusive, and earlier research suggests that both operate simultaneously (Leszczensky & Pink 2017). Yet past research did not assess the relative importance of Muslim in-group bias and non-Muslims' reluctance to be friends with Muslims, leaving open the question of whether friendship segregation arises mainly from the behavior of Muslims or non-Muslims.

In this chapter, I argue that Muslim in-group bias and non-Muslims' reluctance to be friends with Muslims are both relevant, but their importance differs for Muslim boys and girls. Building on arguments from research on

interreligious romantic relations as well as ethnographical and qualitative accounts of young Muslims' and other minorities' social lives in Western societies, I thus develop and test the argument that the processes behind the religious friendship segregation of Muslim youth are *gendered*. On the one hand, I propose that religious in-group bias is stronger for Muslim girls than Muslim boys, because internalized endogamy norms discourage interreligious friendships (Carol 2014; Hanassab 1998) and the stricter parental control of daughters rather than sons further limits Muslim girls' opportunities for interreligious contact (Basit 1997b; Giuliani et al. 2017; Talbani & Hasanali 2000). Considering the friendship-making behavior of non-Muslims, on the other hand, I argue that non-Muslims are more reluctant to be friends with Muslim boys than Muslim girls, because male Muslims tend to be stereotyped as oppressive, dangerous, and "anti-social" (Archer 2009; Erentzen et al. 2022; Ewing 2008; Fourgassie et al. 2023). While this reasoning is specific to public perceptions of young male Muslims in Europe, it also reflects a more general pattern of majority members perceiving minority men more negatively than minority women, as predicted by the so-called subordinate male target hypothesis (Pratto et al. 2006; Purdie-Vaughns & Eibach 2008).

Analyzing large-scale friendship network panel data from the German part of the Children of Immigrants Longitudinal Survey in Four European Countries (Kalter et al. 2016a,b), this chapter's main insight is that the friendship networks of both Muslim boys and girls are religiously segregated, but for different reasons, as gender and religion interact in shaping friendships between Muslim and non-Muslim youth. This finding not only deepens our understanding of the emergence of a relational divide between Muslims and non-Muslims in Europe but also has important implications for the integration of ethno-religious minorities more generally.

2.2 Theory

2.2.1 Religious Friendship Segregation

Religious friendship segregation characterizes all religiously diverse societies (McPherson et al. 2001). Like friendship segregation more generally, religious segregation can result from different mechanisms related to opportunity structures, individual preferences, and third parties. Coreligionists are likely to encounter each other during religious services or other activities organized by religious communities (Foner & Alba 2008; Scourfield et al. 2013). People also show patterns of homophily, i.e., a preference to associate with others who are similar (Leszczensky & Pink 2019; Wimmer & Lewis 2010). Since religion comes

with a specific worldview that includes various norms and values, coreligionists are, on average, more likely to share attitudes, norms, and values compared to individuals from different religious groups. Influence from third parties such as parents, peers, or religious communities further amplifies segregation dynamics (Wimmer & Lewis 2010).

In the Western European context, research on religiously diverse schools indicates a relational divide between Muslim and non-Muslim youth (Drouhot & Nee 2019). Even when they have opportunities to mingle, Muslim youth display an in-group bias, i.e., they tend to less frequently be friends with non-Muslim peers than would be expected based on their opportunities for interreligious friendships (Leszczensky & Kretschmer 2022; Leszczensky & Pink 2017; Simsek et al. 2022; Windzio & Wingens 2014). This religious in-group bias does not necessarily mean that Muslim youth hold negative attitudes towards non-Muslims, but it still suggests that they approach close interaction with other Muslims more favorably than with their non-Muslim peers. Similarly, even when accounting for opportunities for interaction, non-Muslim youth in religiously diverse schools are less likely to make Muslim rather than non-Muslim friends (Leszczensky & Kretschmer 2022; Leszczensky & Pink 2017; Simsek et al. 2022; Windzio & Wingens 2014). Again, this reluctance to make friends with Muslims rather than non-Muslims does not necessarily imply negative feelings towards Muslims. Still, it highlights less openness of non-Muslims to engage in close interactions with their Muslim compared to non-Muslim peers. In sum, both Muslims' in-group bias and non-Muslims' reluctance to be friends with Muslims seem to contribute to religious friendship segregation among Muslim youth. However, previous studies did not examine the relative importance of both processes, thus leaving open the question of which mechanism is more consequential. In the following, I will argue that both processes are relevant, but their contribution to religious friendship segregation is likely to differ between Muslim girls and Muslim boys.

2.2.2 Why Muslim In-Group Bias May be Stronger for Girls than Boys

Following the homophily principle, adolescents of all religious groups are likely to favor religious in-group over religious out-group members to some degree. While this in-group bias should apply to both genders, I argue that it is likely to be stronger for the friendships of Muslim girls than Muslim boys. I derive this expectation from arguments raised in research on endogamy norms and interreligious romantic relations, highlighting that endogamy norms are likely to also have ramifications for Muslim youths' friendship formation.

Gender and Endogamy Norms in Ethno-Religious Minority Groups

In most religious communities, maintaining traditions and customs is primarily considered women's rather than men's duty (Billson 1995; Dion & Dion 2001), and across religious groups, behavioral norms more strongly restrict the behavior of women than men (Clycq 2012; Hennink et al. 1999). This double standard also applies to intergroup dating and marriage, with both Christian and Muslim parents more severely restricting intimate outgroup relationships of their daughters rather than sons (Clycq 2012; Munniksma et al. 2012).

The gendering of ethno-religious boundaries tends to be particularly strong in immigrant families, as many minority parents perceive the preservation of their culture to be threatened by mainstream society (Dion & Dion 2001; also see Hanassab 1998; Sniderman & Hagendoorn 2009). Accordingly, parents in immigrant families more closely monitor the social relationships of their daughters rather than sons, seeking to prevent intergroup dating and the related threat to cultural continuity (Suárez-Orozco & Qin 2006). As a result, teenage girls from ethnic and religious minorities are more restricted in their leisure time activities than their brothers. For example, they report to be less often allowed to attend public social events or to spend unsupervised time with friends after school (Giuliani et al. 2017; Hennink et al. 1999; Le Espiritu 2001; Talbani & Hasanali 2000).

Parents also transmit these gendered norms to their children, as reflected in a greater opposition to intergroup romantic relationships among female compared to male minority youth (Buunk & Dijkstra 2017; Carol & Teney 2015; Van Pottelberge et al. 2019). Therefore, at least some girls indicate that they can understand and agree with the stricter limitations they face compared to their brothers (Basit 1997b; Giuliani et al. 2017; McGrath & McGarry 2014).

Stricter endogamy norms for females compared to males are not specific to Islam (Clycq 2012; Le Espiritu 2001). However, gender differences are particularly strong in Islam because, according to the dominant interpretation of the Qur'an, Muslim men can marry Christian or Jewish women, but Muslim women are forbidden to marry non-Muslims (Cila & Lalonde 2014; Clycq 2012). Many Western Muslim parents therefore much more strongly oppose, and seek to prevent, intergroup dating involving their daughters than their sons (Carol 2016a; Hanassab 1998; Munniksma et al. 2012; van Zantvliet et al. 2015).

Why Endogamy Norms May Hamper Interreligious Friendships

Why would endogamy norms and stricter parental control of interreligious dating interfere with interreligious friendships? Clearly, parental opposition to Muslim girls' intergroup dating complicates friendships with *non-Muslim boys*,

for such friendships are suspect to eventually result in romantic relationships (Afshar 1989; Talbani & Hasanali 2000).

However, parents' rejection of their daughters' intergroup dating is also likely to hamper friendships with *non-Muslim girls*. Since most friendship cliques are not fully segregated by gender, Muslim girls who are not allowed to spend time with non-Muslim boys are effectively excluded from friendship cliques in which boys and girls mingle. Fearing interreligious contact to eventually result in interreligious dating (Carol 2014; Hanassab 1998), some Muslim parents indeed report discouraging their teenage daughters from befriending non-Muslim girls, because these girls, who socialize with boys, may be a bad influence and "source of temptation" (Afshar 1989; Hawkey et al. 2018; Hennink et al. 1999).

Other Muslim parents do not explicitly oppose interreligious friendships, but gendered norms still might limit their daughters' opportunities to befriend non-Muslims. Teenage Muslim girls face more restrictions than their brothers concerning their leisure time and outside-the-home activities, which complicates finding and maintaining outgroup friendships (Hanassab 1998; Talbani & Hasanali 2000). For instance, they report not being allowed "to go out like [their] friends" (Cense 2014), "to go out unaccompanied in the evenings" (Basit 1997b, 433), or "to visit unfamiliar houses" (Vincent et al. 2017, 12). In contrast to their brothers, Muslim girls are therefore often tied to their homes, spending more time with family members and less unregulated time with peers outside the home (Basit 1997b; Giuliani et al. 2017; Talbani & Hasanali 2000). As a by-product of gendered norms, Muslim girls' opportunities to form friendships with non-Muslims are more limited, even if their parents do not directly oppose such relationships.

Finally, Muslim girls are likely to have internalized norms and behavioral expectations that interfere with interreligious friendships. In general, Western Muslim parents are successful in transmitting their religious norms and values to their children (Jacob & Kalter 2013; Soehl 2017), which is also visible in the intergenerational continuity of endogamy norms (Carol 2014). Accordingly, Muslim girls themselves also hold stronger endogamy norms than Muslim boys (Buunk & Dijkstra 2017; Carol & Teney 2015; Cila & Lalonde 2014) and are less likely than Muslim boys to date non-Muslims (van Zantvliet et al. 2015; Wachter & de Valk 2020). While again primarily directed at (cross-gender) romantic relationships, internalized endogamy norms may also impede same-gender interreligious friendships, because they decrease Muslim girls' propensity to spend their leisure time with groups of non-Muslims or attend social events in which they may encounter non-Muslims boys.

Based on these considerations, I expect Muslim girls to have a stronger

in-group bias than Muslim boys, i.e., to more strongly tend to befriend Muslims rather than non-Muslims.

2.2.3 Why Non-Muslims May Be More Reluctant to Be Friends With Muslim Boys than Muslim Girls

Friendships between Muslims and non-Muslims require that non-Muslims also are open to Muslims. However, non-Muslims may be reluctant to be friends with Muslim youth, either because of some remaining reservations and skepticism in spite of generally positive attitudes or because of actual negative attitudes towards Muslims. Many non-Muslim adolescents view their Muslim peers positively, but significant numbers of them also hold negative attitudes and, on average, they view Muslims less favorably than non-Muslims (Verkuyten & Thijs 2010).

Against this background, it is not surprising that research on youths' friendship networks has found non-Muslims to be reluctant to be friends with their Muslim peers (Leszczensky & Kretschmer 2022; Leszczensky & Pink 2017; Simsek et al. 2022; Windzio & Wingens 2014). However, these quantitative network studies did not consider the interplay of religion and gender, so we do not know whether non-Muslims' reluctance to be friends with Muslims is gendered. Based on intersectional reasoning as well as ethnographical, qualitative, and experimental accounts of discrimination against European Muslims, I argue that this is likely to be the case.

The Gendering of Ethno-Religious Outgroups

Some research on the intersection of different social categories suggests a cumulative disadvantage of people who belong to multiple subordinate groups (Anthias & Yuval-Davis 1992); for example, Muslim girls in Germany might face discrimination because of their two-fold subordinate group membership—in terms of their religion and their gender. Rooted in social dominance theory (Pratto et al. 2006), by contrast, the subordinate male target hypothesis states that minority men rather than women are the primary target of discriminatory behavior in most contexts (Sidanius & Veniegas 2008). Because it is mostly men who compete over material and symbolic resources, men from the dominant majority group tend to oppress subordinate minority group men to safeguard their resources (Purdie-Vaughns & Eibach 2008). More recently, this hypothesis was extended to female-male interactions, further arguing that women from the dominant social group discriminate against men from the subordinate group for fear of sexual coercion (Navarrete et al. 2010). According to the subordinate male target hypothesis, minority group men are therefore likely to be perceived

and treated more negatively than minority group women by both majority group men and women.

Social psychological research provides strong empirical support in favor of the subordinate male target hypothesis (Purdie-Vaughns & Eibach 2008). Consistent with this reasoning, field experiments indicate that minority men, and especially Muslim men, face greater discrimination than minority women in European housing and labor markets (Dahl & Krog 2018; Flage 2018; Valfort 2015; Di Stasio et al. 2021; Di Stasio & Larsen 2020). Being perceived as cultural and security threats, young immigrant men are further confronted with more negative attitudes (Ward 2019; Poppe & Andriessen 2022), and natives are less likely to trust them in strategic encounters (Gereke et al. 2020).

Why Non-Muslims May Be Reluctant to Be Friends With Muslim Boys

If, as predicted by the subordinate male target hypothesis, majority group members view minority men more negatively than minority women, minority men would generally face more difficulties in finding outgroup friends. Again, this reasoning is not specific to Muslims, but similar to the case of the endogamy norms discussed above, I argue that less favorable perceptions of men versus women are particularly likely for Muslims in the West.

As documented by qualitative research, young Muslim men are often portrayed as "new folk devils" and feared as the archetypical "outsiders within" (Archer 2009; also see Ewing 2008). Compared to their female coreligionists, young Muslim men confront the stereotype of being responsible for crime and cultural dysfunction, positioning them as outsiders and a threat to social order and coexistence (Britton 2019; Fourgassie et al. 2023). Many non-Muslims further hold unfavorable views of Muslim men because of alleged oppressive and restrictive behavior towards women (Clycq 2012; Crozier & Davies 2008; Erentzen et al. 2022). The existence of such stereotypes does not mean that non-Muslim youth necessarily hold negative attitudes towards male Muslim classmates, whom they often know well enough to judge based on their individual character. Nonetheless, such stereotypes imply some residual skepticism and reservations towards Muslim boys that may complicate the emergence of friendships. This does not apply to Muslim girls, who are perceived more favorably and less threatening. Granted, Muslim girls face stereotypes of their own, for example being "uneducated" (Sirin & Katsiaficas 2011), lacking self-confidence (Basit 1997b), or being controlled by their family and, especially, male relatives (Crozier & Davies 2008; Erentzen et al. 2022). These stereotypes can be further reinforced for Muslim girls who start to veil in adolescence (Abo-Zena 2019; Choi et al. 2023). However, even though these stereotypes are also negative,

they are less clearly associated with bad character, danger, or "anti-social" traits (Fourgassie et al. 2023), which is why I expect them to be less consequential for adolescents' friendship-making behavior.

The notion that non-Muslims perceive Muslim men less favorably than Muslim women matches Muslims' own perceptions. In both the United States and Europe, Muslim men—and especially younger ones—report more personal discrimination than Muslim women (Alanya et al. 2017; Zainiddinov 2016). The contexts of personal discrimination further seem to be gendered, with Muslim women reporting more discrimination by strangers in public settings and Muslim men perceiving more discrimination in school or when going out (Alanya et al. 2017). While female Muslims also face negative reactions from non-Muslims in Western countries that range from skepticism to hostility, these perceptions are again less clearly related to the formation of social relationships compared to male Muslims.

Given the stereotypes and prejudices concerning young male rather than young female Muslims, I expect non-Muslims to be more reluctant to be friends with Muslim boys than Muslim girls.

2.3 Data and Methods

2.3.1 Data

I test the expectations on gendered in-group bias and out-group reluctance with German data from the first two waves of the *Children of Immigrants Longitudinal Survey in Four European Countries* (CILS4EU, Kalter et al. 2016a,b). CILS4EU randomly sampled German schools, oversampling those with a high share of adolescents with a migration background. The first wave of data was collected in 2010 and 2011; the second wave was collected one year later. Within schools, ninth-graders (average age: 14-15) were targeted in the first wave, and usually all students from two randomly selected classrooms were surveyed. Next to questionnaires on individual characteristics, the survey contained a sociometric questionnaire to assess students' friendships within their classroom as well as a questionnaire with one of the students' parents.

5,013 students attending 271 classrooms participated in the first wave of the German sample. However, for two reasons, the analysis in this chapter relies on a reduced sample of 3,194 students in 149 classrooms. First, the network models I introduce below require longitudinal network data. I therefore excluded 71 classrooms that did not provide *longitudinal* network data, mostly because students in lower secondary schools left school after the first wave of data collection. Second, while techniques for longitudinal social network analysis

can accommodate missing network data, high levels of non-response at the actor level can introduce bias (Ripley et al. 2023). I therefore also excluded 51 classrooms with a unit non-response of more than 50% in at least one of the two waves. Importantly, a detailed analysis of attrition in Appendix A.1 shows that the 149 classrooms included in the analysis do not substantively differ from the full CILS4EU sample in any of the characteristics I focus on subsequently.

2.3.2 Variables

I assess students' *friendship networks* through the information they provided in the sociometric classroom questionnaire. Students could nominate up to five best friends from their classroom, and these directed friendship nominations constitute the social networks I analyze. On average, classrooms in the analysis sample consist of about 21 students. Across both waves, students nominated an average of 3.78 best friends. Boys nominated more friends than girls (3.91 vs. 3.64), but friendship network size did not differ between Muslims and non-Muslims.[1]

Students self-reported their *gender* and girls made up 51% of the sample. Students also self-reported their religious affiliation, with 24% of youth identifying as *Muslim*. Of the remaining 76% *non-Muslim* students, 77% were Christian, 18% did not belong to a religious group, and only 5% were part of a religious group other than Islam or Christianity. I combined these different non-Muslim groups due to a lack of distinct theoretical expectations for each group and the data's insufficient statistical power to estimate separate effects. This decision is further justified by research from German schools, which showed that both Christian and non-religious youth were less likely to be friends with Muslim peers but did not discriminate against each other (Leszczensky & Pink 2017), a pattern that replicates in the CILS4EU data.[2]

I further account for adolescents' ethnic background throughout the analysis to avoid confounding the role of religion and ethnicity in friendship choices. Students' ethnic background is coded according to their own, their parents', and their grandparents' countries of birth. Students are considered to be of German origin if they themselves and all of their parents and grandparents were born in Germany; otherwise, they are assigned to their ancestors' country of birth (Dollmann et al. 2014). I also control for students' socio-economic

[1]The restriction to nominate only five friends is a limitation of the CILS4EU data. However, it should not threaten conclusions regarding gendered friendship choices because, on average, Muslims and non-Muslims nominated the same number of friends, and the tendency of boys to nominate more friends than girls was also consistent across both groups.

[2]This is shown in an extended analysis in Appendix A.2 As described in the appendix, the main results are further robust to focusing on friendships between Christians and Muslims alone, rather than considering all non-Muslims jointly.

background, proxied by parents' highest occupational status as measured on the ISEI scale. If available, I used occupational information from the parental interview. Otherwise, I employed information from the youth interview.

All individual variables are based on information collected in wave 1 of the CILS4EU study. I imputed socio-demographic information with data from wave 2 or wave 3 if information was missing in the first wave of data collection.[3]

2.3.3 Methods

Analytical Strategy

I rely on stochastic actor-oriented models for network evolution (SAOM; Snijders et al. 2010) to analyze adolescents' friendship-making behavior and its effect on religious segregation. SAOMs allow me to separate different mechanisms behind friendship segregation by studying actors' friendship-making as networks evolve over time. Using SAOMs, I can investigate the behavior of both Muslim and non-Muslim adolescents simultaneously and therefore assess the contribution of both Muslim in-group bias and non-Muslims' reluctance towards Muslims to overall Muslim friendship segregation. To grasp the importance of in-group bias and out-group reluctance in substantive terms, I complement the SAOM analysis with counterfactual simulations of the evolution of friendship networks resulting from these analyses. This allows me to quantify the extent of religious friendship segregation that emerges for Muslim adolescents under different scenarios and to assess whether the contribution of non-Muslims' reluctance and Muslims' in-group bias to religious segregation differs between boys and girls.

Stochastic Actor-Oriented Models (SAOMs)

SAOMs study the evolution of networks over time, thus requiring empirically observed social networks at two or more points in time. By means of agent-based simulation, SAOMs model the overall change in a network as a result of repeated micro steps in which individual actors change one network tie at a time. In each micro step, a randomly chosen actor decides to either create a new network tie, drop an existing one, or make no change, which jointly models the formation of new friendship ties and maintenance of preexisting ties. These decisions depend on the specification of the so-called *objective function*, which

[3] Item non-response is very low. Of all the students in the network sample that were surveyed in wave 1, only information on parental ISEI is missing in more of 3% of all cases (7.7%). After imputing with information from later waves, parental ISEI is missing in 5.9% of the cases, country of origin in 2.5%, and religious denomination in .2%. Information on students' gender is complete.

captures the theoretical mechanisms expected to guide tie formation behavior. For example, Muslim in-group bias can be assessed by including effects that capture Muslims' tendency to form and maintain friendships with Muslim and non-Muslim peers. All SAOM analyses account for the availability of Muslim and non-Muslim boys and girls in class, thus controlling for the opportunity for friendships with Muslims and non-Muslim classmates of either gender. Detailed introductions about SAOMs are provided by Snijders et al. (2010) and Ripley et al. (2023).

In this chapter, I rely on a random-coefficients multilevel SAOMs, which jointly estimate coefficients for the specified behavioral tendencies across all networks in the analysis sample but can model variation in effects at the network level through random effects (Ripley et al. 2023). With this approach, complex SAOMs can be estimated based on comparatively small networks, like the CILS4EU classroom networks. In the models, I treat endogenous network effects (such as reciprocity and transitivity) as random effects and all covariate effects as fixed effects.[4] Random-coefficients multilevel SAOMs are estimated with a Bayesian estimation technique which models sequences of the individual-level network changes between observation periods, as implemented in the *RSienaTest* package (Version 1-2.16) in R. SAOMs can treat missing information in the data internally, minimizing the impact of missing information on parameter estimation. All covariates are centered in the analyses. According to standard assessments of convergence for random-coefficients multilevel SAOM (Ripley et al. 2023), all models exhibited satisfactory convergence. In Appendix A.3, I provide details on convergence and the specification of priors for the Bayesian analysis.

Model Specification

In this chapter, I am interested in whether Muslim youth display an in-group bias, whether non-Muslim youth are reluctant to be friends with Muslim peers, and whether these patterns differ by gender. To model in-group bias and reluctance, I use the combination of the *Muslim ego* effect, *Muslim alter* effect, and *Muslim ego* $\times$ *Muslim alter* interaction effect. The *Muslim ego* effect models whether Muslim youth nominated more friends than non-Muslim youth. The *Muslim alter* effect captures whether Muslim students received more friendship nominations than non-Muslim students. Finally, the *Muslim ego* $\times$ *Muslim alter*

[4] A standard on which effects to treat as random versus fixed has not yet emerged in the literature (Ripley et al. 2023). However, effects that are of key theoretical interest—such as those relating to religion in this application—are usually treated as fixed, because random effects are estimated with less precision than fixed effects (e.g., Boda 2018; Raabe et al. 2019).

interaction effect assesses whether the tendency to nominate Muslims rather than non-Muslims differed between Muslims and non-Muslims.

From this set of effects, I can determine the tendency of Muslim youth to form and maintain friendships with other Muslim youth—i.e., friendships in which both ego and alter are Muslim—as the sum of three coefficients

$$b_{Muslim\ ego} + b_{Muslim\ alter} + b_{Muslim\ ego \times Muslim\ alter},$$

where $b_{Muslim\ ego}$, $b_{Muslim\ alter}$, and $b_{Muslim\ ego \times Muslim\ alter}$ are the coefficients associated with the *Muslim ego, Muslim alter*, and *Muslim ego* $\times$ *Muslim alter* effects, respectively. The tendency of Muslim youth to be friends with non-Muslim youth is given by $b_{Muslim\ ego}$, as alter is non-Muslim in these friendships, so the effects relating to *Muslim alter* default to zero. *Muslims' in-group bias*, the tendency of Muslims to become or remain friends with Muslims rather than non-Muslims, is the difference of these expressions:

$$b_{Muslim\ ego} + b_{Muslim\ alter} + b_{Muslim\ ego \times Muslim\ alter} - b_{Muslim\ ego}$$

$$= b_{Muslim\ alter} + b_{Muslim\ ego \times Muslim\ alter}.$$

Similarly, I capture *non-Muslims' reluctance* to be friends with Muslim peers by the difference between non-Muslim adolescents' tendency to form friendships with other non-Muslims and the tendency to form friendships with Muslims, which reduces to

$$0 - b_{Muslim\ alter} = -b_{Muslim\ alter},$$

because both the *Muslim ego* and *Muslim ego* $\times$ *Muslim alter* effects do not apply for the friendship nominations of non-Muslim adolescents.

These linear combinations describe Muslim in-group bias and non-Muslims' reluctance to be friends with Muslims in *general*, i.e., not differentiating between boys and girls. I assess *gender differences* by interacting these tendencies with students' gender. In Model 1, I interact the *Muslim ego, Muslim alter*, and *Muslim ego* $\times$ *Muslim alter* effect each with a *Girl ego* effect to capture how boys and girls differ in forming and maintaining friendships with Muslims and non-Muslims. In Model 2, I additionally consider the relevance of *friends' gender* by further interacting the *Muslim ego, Muslim alter*, and *Muslim ego* $\times$ *Muslim alter* effect with a *Girl alter* and *Girl ego* $\times$ *Girl alter* effect.

As control effects, I account for the predominance of same-gender and same-ethnic friendships, capturing the former with the *Girl ego, Girl alter*, and *Girl ego* $\times$ *Girl alter* effects and latter with a *same ethnic background* effect. Furthermore, I account for friendship-making according to adolescents' socio-economic

background by including *parental highest ISEI ego, alter*, and *similarity* effects. These effects investigate whether adolescents with higher parental ISEI were more active, were more popular, and became and remained friends with classmates with a similar socio-economic background. (I do not include comparable ego and alter effects for country of origin because there are too many different countries of origin to fit models including these effects.)

Finally, all models account for general structural processes of network evolution, as recommended by Ripley et al. (2023). I capture the tendency to reciprocate incoming friendship ties with a *reciprocity effect* and capture transitive closure, the tendency to befriend friends of one's friends, with the *generalized weighted edge-wise shared partners (GWESP)* effect. An interaction of the reciprocity and GWESP effects accounts for differences in reciprocity in closed relative to open triadic structures. To model dispersion in the in- and outdegree distribution as well as the interrelation of in- and outdegree, I use the *outdegree-activity, indegree-popularity*, and *indegree-activity* effects. Finally, I capture network density with the *outdegree* effect.

Simulation Analysis

SAOMs are well-suited to investigate in-group bias and reluctance and to assess whether these behavioral patterns differ by gender. However, since SAOMs yield estimates from nonlinear probability models, coefficients provide little information on the substantive size of these effects in shaping actual friendship networks. Therefore, I complement SAOMs with simulations that assess the relative importance of Muslim in-group bias and non-Muslims' reluctance for the emergence of religious friendship segregation among Muslim boys and girls. Based on the empirically observed friendship networks in the first wave and coefficients obtained from the SAOM analysis, I simulate friendship networks in the second wave of data. I then compare different counterfactual scenarios that deactivate Muslim in-group bias and/or non-Muslims' reluctance to capture their relative importance for Muslim youths' friendship segregation.

2.4 Results

2.4.1 How Segregated Are the Friendship Networks of Muslim Boys and Girls?

I start by descriptively assessing the extent of religious friendship segregation among Muslim youth in the sample. This descriptive analysis focuses on *reciprocated* friendships—i.e., on pairs of students in which each student

Table 2.1: Religious Friendship Segregation among Muslim Youth by Gender

Gender	Share of Muslims		Excess segregation:
	Reciprocated friendships	Available classmates	Share among friendships − Share among classmates
Both	0.67	0.52	0.15^{***}
Girls	0.66	0.52	0.15^{***}
Boys	0.68	0.52	0.16^{***}

Note: $^{\dagger}p < .10$,* $p < .05$,** $p < .01$,*** $p < .001$.

nominated the other as a friend. Friendship segregation among Muslim youth can originate from both Muslim adolescents' in-group bias and non-Muslim youths' reluctance to be friends with Muslims. Therefore, only a focus on reciprocal friendships allows to directly capture both sources of segregation because non-reciprocal relations necessarily focus on either Muslim or non-Muslim friendship-making behavior. In the data, reciprocated friendships represent the majority of all friendships, with 70% of girls' and 63% of boys' friendships being reciprocated and no differences in these frequencies between Muslim and non-Muslim youth.[5]

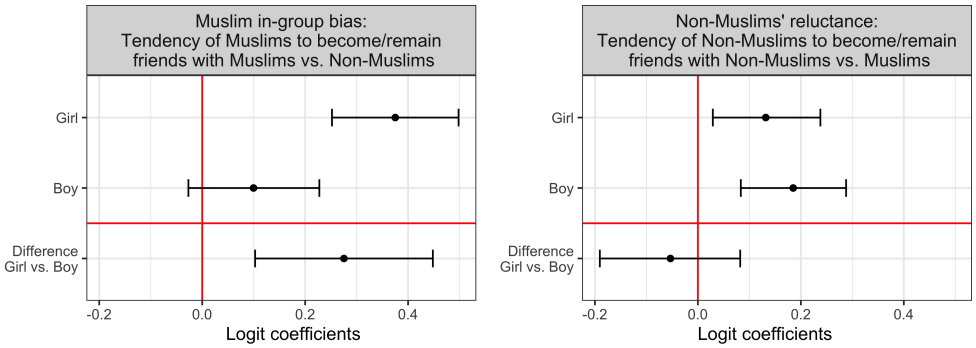
Table 2.1 shows the share of Muslim friends in the reciprocated friendships of Muslim boys and girls. An average of 67% of the reciprocated friendships of Muslim youth were with other Muslims. This share must be judged against the opportunities of Muslim youth to form friendships with Muslim and non-Muslim peers. Therefore, Table 2.1 also displays the average share of other Muslim students encountered by Muslim youth in their classrooms.[6] If friendship formation was not related to religious affiliation, the share of Muslim friends should, on average, match the share of available Muslim classmates. However, Muslim youth clearly exhibit *excess segregation*, i.e., segregation above the levels suggested by classroom religious composition. The share of Muslims among the friends of Muslims exceeds the share of available Muslim students in the classroom by about 15 percentage points, a difference that is statistically significantly ($p < .001$).

Table 2.1 further indicates that the level of excess segregation is similar for Muslim boys and girls, with about two out of three friends of both Muslim boys

[5] I also observe religious segregation in non-reciprocated friendships, though it is weaker than for reciprocated friendships. When considering all friendship nominations jointly rather than only reciprocated nominations, the findings from Table 2.1 remain substantively unchanged.

[6] This average share of Muslim students excludes the focal student him-/herself, thus reflecting the pool of possible friends. This share does not correspond to the average share of Muslim students across all classrooms (24%) but to the average share that Muslims faced in their classrooms. The latter figure is higher, because Muslim students tend to be clustered within classrooms.

Figure 2.1: Tendency of Muslim and Non-Muslim Girls and Boys to Become/Remain Friends with Muslims and non-Muslims



Note: Posterior means of linear combinations and 95% credible intervals.

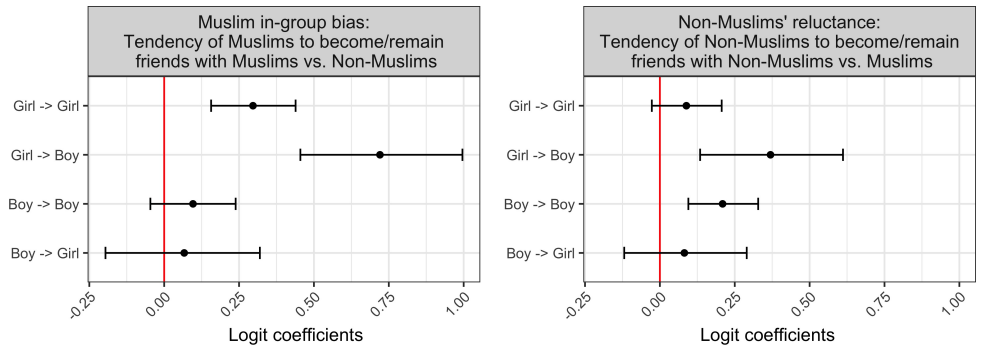
and girls being Muslim as well. However, this descriptive assessment does not clarify whether the underlying mechanisms of in-group bias and reluctance also operate similarly for Muslim boys and girls to produce these patterns. To disentangle and assess these processes, I now turn to the SAOM analysis.

2.4.2 Are There Gender Differences in Muslim In-Group Bias and Non-Muslims' Reluctance to Be Friends With Muslims?

In the first SAOM analysis, I investigate friendship-making among both Muslim and non-Muslim boys and girls. The key results from Model 1 are displayed in Figure 2.1 (for full model results, see Table A.1 in Appendix A.4). For both Muslim in-group bias and non-Muslims' reluctance to be friends with Muslims, Figure 2.1 displays posterior means and 95% credible intervals, which are the Bayesian equivalents to point estimates and 95% confidence intervals. Figure 2.1 displays in-group bias and reluctance separately for boys and girls, as well an estimate of gender differences. All results show logit effects on the probability of friendship formation and maintenance, often referred to as contributions to the objective function (Ripley et al. 2023).

Starting with *Muslim girls*, the left panel of Figure 2.1 indicates a clear in-group bias. Accounting for opportunity structures, relational mechanisms, and ethnic and socioeconomic background with the SAOMs, Muslim girls were more likely to become and remain friends with Muslim rather than non-Muslim peers ($p < .01$). By contrast, there is little evidence that *Muslim boys* strongly tended to be friends with other Muslims, as reflected by a smaller estimate that fails to reach conventional levels of statistical significance ($p = .13$). The difference between Muslim girls and boys is itself statistically significant ($p < .01$), indicating that, consistent with theoretical expectations, Muslim girls had a stronger in-group bias than Muslim boys.

Figure 2.2: Tendency of Muslim and Non-Muslim Girls and Boys to Become/Remain Friends with Muslim and Non-Muslim Girls and Boys



Note: Posterior means of linear combinations and 95% credible intervals.

The weak in-group bias of Muslim boys calls for an alternative explanation of the high levels of religious friendship segregation that they exhibited in Table 2.1. As suggested in the theoretical assessment, the gendered friendship-making behavior of *non-Muslim* youth might account for this pattern. In the right panel of Figure 2.1, we see that both non-Muslim boys and girls were more likely to report non-Muslims rather than Muslims as friends ($p < .05$ for both genders), and there is no gender difference in this tendency ($p = .45$).

But does non-Muslim adolescents' reluctance to be friends with Muslim peers depend on whether these are *boys* or *girls*? To find out, the second SAOM analysis further differentiates friendship choices by *friends' gender*, allowing me to investigate whether non-Muslim youth of both genders treated Muslim boys and girls differently. The results from Model 2 are displayed in Figure 2.2 (see Table A.2 in Appendix A.4 for complete model results).

Figure 2.2 shows that the friendship choices of non-Muslims are indeed gendered. The right panel of Figure 2.2 provides no evidence that non-Muslim youth of either gender were reluctant to be friends with Muslim *girls* ($p = .15$ for non-Muslim girls and $p = .43$ for non-Muslim boys). In stark contrast, non-Muslim youth of both genders were notably less likely to become and remain friends with Muslim rather than non-Muslim boys (both $p < .01$). Consistent with expectations, non-Muslims of both genders thus were reluctant to be friends with Muslim boys but not Muslim girls.

Returning to *Muslim* youth, the results from Model 2 confirm the pronounced in-group bias among Muslim girls but not Muslim boys in Model 1. As the left panel of Figure 2.2 shows, in both same- and cross-gender friendships, Muslim boys did not clearly make Muslim rather than non-Muslim friends. Muslim girls, by contrast, showed a clear in-group bias, which was even stronger for relationships with boys than girls. This strong in-group bias for cross-gender

friendships is in line with the stronger effects that endogamy norms should have on cross-gender relations.

In combination, the patterns observed in Figures 1 and 2 provide an explanation for the descriptive finding of similarly high levels of segregation among Muslim boys and girls from Table 2.1. According to the SAOM analysis, Muslim girls are segregated largely due to their pronounced in-group bias, whereas their non-Muslim peers did not differentiate between Muslim and non-Muslim girls. By contrast, Muslim boys seem to primarily end up segregated because non-Muslim youth were reluctant to be friends with them, even though Muslim boys themselves did not have a strong in-group bias.

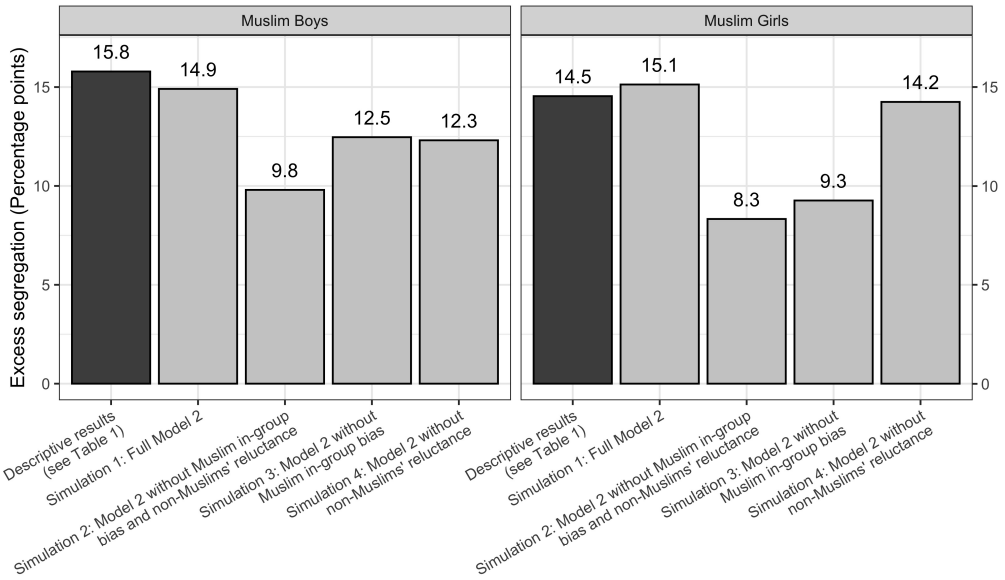
2.4.3 How Consequential Are In-Group Bias and Reluctance for Religious Friendship Segregation?

The SAOM analysis has identified gendered patterns of both Muslim in-group bias and non-Muslims' reluctance to be friends with Muslims. In a final step, I assess what consequences these behavioral tendencies have for the emergence of religious segregation in reciprocated friendships. To provide a test of the relative contribution of both mechanisms, I conducted a simulation analysis based on the SAOM results from Model 2. In the simulations, I use the empirically observed networks from the first wave and coefficients from Model 2 to simulate possible second-wave networks that can emerge from the model, employing the simulation routine for SAOMs implemented in *RSienaTest* (Ripley et al. 2023).

Starting with the networks observed in the first wave, actors in these simulations form, maintain, and dissolve friendships according to the behavioral tendencies identified in a given model, producing plausible simulated networks in the second wave. Because actors' decisions in these simulations are stochastic, results can fluctuate across simulation runs. Therefore, for each of the 149 classrooms in the analysis, I simulate a large number ($n = 4000$) of second-wave networks according to Model 2. Then, I investigate the extent of excess segregation in these simulated networks, i.e., the share of reciprocated friendships of Muslim boys and girls to other Muslims relative to the share expected based on the proportion of Muslim classmates (see Table 2.1). To compare the importance of Muslim in-group bias and non-Muslims' reluctance to be friends with Muslims, I run several different simulations. In each simulation, I assess excess segregation in networks simulated based on Model 2, but counterfactually activate or deactivate in-group bias and out-group reluctance by setting the corresponding coefficients (or linear combinations) to zero.

Figure 2.3 compares the extent of excess segregation across the different simulation setups. To put the results in perspective, I also display the excess

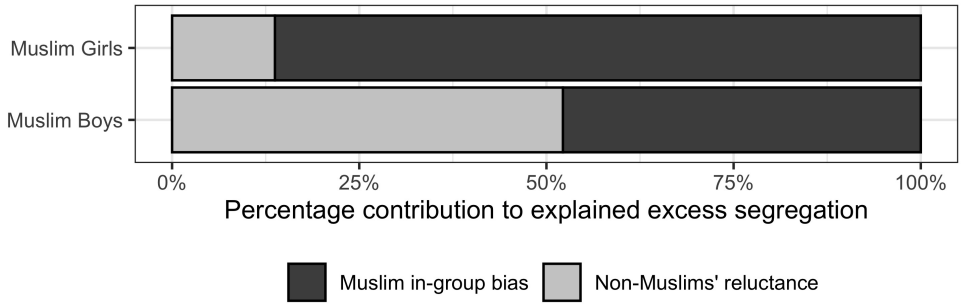
Figure 2.3: Results from Simulation Analysis: Excess Segregation among Muslim Boys and Girls for Different Simulations



segregation from the descriptive analysis in Table 2.1 in a dark color. Simulation 1 assesses the level of excess segregation predicted from the full Model 2, which includes both Muslims' in-group bias and non-Muslims' reluctance to be friends with Muslims. According to Figure 2.3, the simulation results resemble the descriptive findings, suggesting that the simulation analysis indeed captures the extent of segregation observed empirically (differences are not statistically significant, $p > .4$). The simulated networks exhibit substantial levels of excess segregation of about 15 percentage points, with similar levels for boys and girls.

Simulation 2 assesses excess segregation when both Muslim in-group bias and non-Muslims' reluctance are turned off. As Figure 2.3 shows, excess segregation is reduced but still present in this setup, even though group-specific friendship-making behavior is deactivated among both Muslim and non-Muslim youth. Recall, however, that the simulations are based on the results of the SAOM analysis *and* the observed networks in the first wave. Therefore, the excess segregation observed in Simulation 2 also captures religious friendship segregation that was already present in the first wave as well as the effects of reciprocity and transitive closure that can further reinforce such initial segregation. The gap between Simulation 1 and Simulation 2 therefore captures the contribution of Muslims' in-group bias and non-Muslims' reluctance to be friends with them to the *change* in excess segregation between the two waves rather than their total impact on segregation. The difference in excess

Figure 2.4: Results from Simulation Analysis: Contribution of Muslim In-Group Bias and Non-Muslims' Reluctance to Explained Excess Segregation among Muslim Boys and Girls



segregation between Simulation 1 and 2, though substantial, thus necessarily *under*estimates the total contribution of these mechanisms to segregation.

Simulation 3 assesses excess segregation when Muslim adolescents' in-group bias is turned off, while non-Muslims' reluctance to be friends with Muslims is turned back on. In this setup, predicted excess segregation substantially differs for Muslim boys and girls. While, relative to Simulation 1, excess segregation diminishes for both groups, the decrease is substantially higher for Muslim girls, with 5.8 percentage points compared to 2.4 percentage points among boys. This reflects Muslim girls' strong in-group bias and the weaker in-group bias of Muslim boys from Model 2. The simulation thus supports the conclusion that the importance of Muslim in-group bias differs between boys and girls. If in-group bias was absent among Muslim girls, excess segregation would be much lower for them, but Muslim boys' excess segregation would not be strongly reduced.

In Simulation 4, I turn off non-Muslim adolescents' reluctance to be friends with Muslims (and turn on Muslims' in-group bias again). This final setup shows a reverse pattern across genders. Excess segregation among Muslim girls only decreases by 0.9 percentage points when reluctance is turned off. This again is in line with the results from Model 2, suggesting that non-Muslim youth were not reluctant towards friendships with Muslim girls. Among Muslim boys, by contrast, excess segregation drops by 2.6 percentage points when reluctance is turned off; this effect is comparable in size to that of deactivating boys' in-group bias. This suggests that, unlike for Muslim girls, non-Muslims' reluctance to be friends with Muslim boys substantially contributes to religious friendship segregation.

Figure 2.4 quantifies the relative contribution of in-group bias and reluctance to the excess segregation the simulations can explain. For Muslim boys, in-group bias is responsible for 48% of the explained excess segregation, while 52% are

due to non-Muslims' reluctance. Muslim boys' religious friendship segregation is thus equally as strongly affected by their own in-group bias and non-Muslims' reluctance to be friends with them. For Muslim girls, by contrast, non-Muslims' reluctance is much less important, with a contribution of only 12%, whereas 88% of the explained excess segregation is due to Muslim girls' in-group bias. Unlike for Muslim boys, Muslim girls' religious friendship segregation is thus primarily shaped by their pronounced in-group bias rather than non-Muslims' reluctance to be friends with them.

2.5 Discussion

Why do Muslim youth tend to be friends with other Muslims rather than non-Muslims, even if they attend religiously diverse schools with opportunities to mingle? Revealing gendered friendship choices among both Muslims and non-Muslims, this chapter suggests that the answer to this question differs for boys and girls. Analyzing school-based friendship networks in Germany, I find a strong religious in-group bias for *Muslim girls* but a much weaker one for *Muslim boys*. By contrast, *non-Muslims* of either gender were reluctant to be friends with Muslim boys but not Muslim girls.

In a simulation analysis based on these findings, I further showed the consequences of this gender-specific individual-level behavior for overall religious friendship segregation. The simulation confirms that although absolute levels of friendship segregation are similar among Muslim boys and girls, this is for different reasons. Muslim girls end up religiously segregated mainly because of their own in-group bias, not because non-Muslims are reluctant to be friends with them. By contrast, non-Muslims' reluctance to be friends with Muslims and Muslim in-group bias make equally strong contributions to friendship segregation among Muslim boys. In combination, the results thus demonstrate that the emergence of religious segregation in adolescents' friendship networks follows from an interplay of religion and gender.

These findings not only improve our understanding of religious friendship segregation but also have important implications for the broader integration of Muslims in Europe. For example, non-Muslims' reluctance to be friends with Muslim boys may worsen Muslim boys' attitudes towards non-Muslims, perhaps even leading to alienation or hostility. Ultimately, non-Muslims' reluctance to be friends with Muslim boys may trigger a downward spiral of mutual suspicion between Muslim boys and non-Muslims, potentially resulting in a self-fulfilling prophecy of Muslim boys becoming social pariahs despite their initial openness to interreligious friendships. This social exclusion may in turn

hamper cultural and emotional identification (Kretschmer 2018; Leszczensky et al. 2020b; Maliepaard & Alba 2016). Similarly, while the analysis indicates that Muslim girls are more readily accepted as friends by non-Muslims, their own strong in-group bias could constrain their cultural or socioeconomic integration. Since majority group contact improves minority educational and occupational attainment (Koopmans 2016; Lancee 2012), Muslim girls' self-segregation could backfire by limiting their educational and economic success. In addition, Muslim girls' strong in-group bias could, in the long term, also decrease the openness of non-Muslims to engage in friendships with them.

2.5.1 Towards a Better Understanding of Gendered Religious Friendship-Making

By providing first insights into the gendered processes of religious friendship segregation, this chapter raises several follow-up questions. Most clearly, the findings call for a more detailed understanding of the mechanisms behind Muslim girls' strong in-group bias and non-Muslims' reluctance towards Muslim boys. The empirical results in this chapter are consistent with the expectation that Muslim girls face gendered endogamy norms that not only complicate their interreligious dating but also friendships with non-Muslims. However, in the analyses provided here, there is no direct evidence on this mechanism. Such evidence is clearly is needed, and I return to the collection of such evidence in Chapter 4. The findings are also compatible with the theoretical idea that Muslim boys face strongly negative stereotypes, due to which non-Muslim youth tend to more frequently abstain from friendships with them than from those with Muslim girls.

Another key question concerns the *dynamics* of Muslim in-group bias and non-Muslim reluctance in the long run. This developmental perspective is important not only because non-Muslims may react to the strong in-group bias of Muslim girls by increasingly withdrawing from them, but also because Muslim boys may become weary of friendship-making with non-Muslims if the latter's reluctance towards them persists. In addition, the forces underlying Muslim in-group bias and non-Muslim reluctance can change over time. If gendered endogamy norms indeed are behind Muslim girls' strong in-group bias, this bias is likely to be *lower* in childhood and early adolescence and *higher* in later adolescence (Scourfield et al. 2013; Hennink et al. 1999). After all, endogamy norms target romantic relationships, and romantic relationships only become relevant after the onset of puberty and increasingly so as adolescence progresses (Collins et al. 2009). Similarly, stereotypes of danger, violence, and oppression might more strongly be applied to male Muslim youth once they

approach adulthood, also suggesting variability in non-Muslims' reluctance towards Muslim boys. To go beyond the short-term perspective on friendship-making this chapter provided and address these potential trajectories, Chapter 3 provides a more dynamic assessment of in-group bias and out-group reluctance.

Finally, the gendered patterns of in-group bias and reluctance I find suggested asymmetries in friendship relations. Net of a variety of other friendship-making processes, non-Muslims tended to more often indicate Muslim girls as friends than vice-versa, and Muslim boys more frequently indicated non-Muslims as friends than vice-versa. While I argued that these asymmetries are driven by a stronger in-group bias among Muslim girls and non-Muslims' reluctance to be friends with Muslim boys, asymmetric relationships can also emerge for other reasons (Vörös et al. 2019). First, the meaning of friendship may differ by gender and/or ethno-religious group (Adams et al. 2000). For example, Muslim girls could define friendship more narrowly than Muslim boys do, hence less frequently considering non-Muslims as friends rather than mere acquaintances. However, if such stricter definitions of friendship resulted in a lower number of *out-group* friends rather than a lower number of friends in general, this would again mean it specifically is the out-group that is evaluated less favorably, as captured by the theoretical considerations regarding in-group bias. Though contested (Vörös et al. 2019), a second frequent interpretation of asymmetric relations is that they reflect status hierarchies. Applied to this case, non-Muslims may infrequently consider Muslim boys their friends because these have lower status, whereas Muslim boys might seek friendships with higher-status non-Muslims and misinterpret their attention or politeness as an indicator of friendship. However, there is no comparable pattern for Muslim girls, who would also be affected by general status differences between Muslims and non-Muslims. Religious status differences could therefore only be a main force behind the gender-specific patterns if low status was specific to Muslim boys, which would again imply less positive attitudes towards this specific group, as suggested theoretically. This also applies to further explanations of asymmetric relations, such as measurement error, recall bias, or limited nominations, all of which could only account for the specific interplay of gender and religion observed under additional assumptions about relative preferences.

2.5.2 Broader Implications for the Social Integration of Ethno-Religious Minorities

Besides enriching our understanding of friendship segregation of Muslims in Europe and raising new questions in this regard, this chapter's findings also have broader implications for majority-minority group relations. Before I again

narrow my focus to Muslims in the European context in the next chapters, the end of this chapter thus provides an opportunity to highlight the theoretical considerations and empirical findings relevant for the situation of ethno-religious minorities more generally. Specifically, strong endogamy norms and stricter parental control of girls have been documented in various ethnic, racial, and religious groups (Le Espiritu 2001; Suárez-Orozco & Qin 2006), but their ramifications for intergroup friendships have not yet been examined. This study suggests that minority girls in other contexts might also be more strongly inclined to form in-group friendships. Similarly, irrespective of the specific situation of Muslims in Europe, the subordinate male target hypothesis suggests that majority group members are generally less positive towards minority men than women. Minority boys therefore may face greater obstacles in being accepted by majority youth, even if they themselves are open to outgroup friendships.

Examining gendered pathways of ethno-religious friendship segregation in other contexts therefore is an important task for future research. Religiously more diverse countries than Germany provide particularly interesting cases, as they would allow for an examination of whether gendered friendship patterns apply to religious minority groups apart from Muslims. Moreover, research on different national contexts would allow for investigating the conditions under which intergroup friendship choices are gendered. In the United States, for example, stereotypes towards Black men could be comparable to those faced by male Muslims in Europe, whereas other minority men, such as Asian Americans, may not face these kinds of stereotypes. Concerning religious groups, non-Muslims' reluctance to be friends with male Muslims might be less strong in countries in which relations between Muslims and non-Muslims are less tense than in Western Europe, such as Canada or the United States. In Europe, comparing non-Muslims' interactions with male Muslims to their interactions with religious minority men who face less, or other, stereotypes, such as Sikhs or Hindus in the United Kingdom, may help to clarify the generality of the gendered effects detected in this chapter.

Chapter 3

Stable or Dynamic? The Development of Gendered Interreligious Friendship-Making in Adolescence

A different version of this chapter, co-authored with Lars Leszczensky, is invited for revision and resubmission at an international peer-reviewed journal. For reasons of consistency, I have rewritten the chapter from a first-person perspective and have made both linguistic and substantive changes.

Abstract

In the preceding chapter, I detected gendered patterns of Muslim in-group bias and non-Muslim reluctance among 14-16-year-old adolescents in Germany. In this chapter, I go beyond the last chapter's static assessment of mid-adolescence and study how Muslim and non-Muslim youths' gendered intergroup friendship-making develops across the adolescent years. I expect intertemporal variation for Muslim girls in particular, whose in-group bias is likely to rise in reaction to endogamy norms that increasingly complicate their out-group relations as adolescence progresses. However, I also consider other potential dynamics, such as changing stereotypes towards Muslim boys or non-Muslims' potential reactions to Muslim girls' increasing in-group bias.

Analyzing six waves of longitudinal friendship network data in German schools, I use growth-curve and stochastic actor-oriented models for network evolution to study how religious friendship-making evolves from the age of 11 to 17. I find that Muslim girls' in-group bias rises steeply and continually throughout adolescence. While Muslim girls are still open to interreligious friendship-making at age 11, their in-group bias becomes substantial and surpasses that of Muslim boys by mid-adolescence, only to grow further from there on. This rise in in-group bias is earlier and more rapid in friendships with boys than girls. By contrast, there is no evidence of substantial change in either Muslim boys' in-group bias or gender-specific reluctance among non-Muslims. Other than in the previous chapter, there is also no evidence that non-Muslims are more reluctant towards friendships with Muslim boys than girls.

3.1 Introduction

In the previous chapter, we have seen that mid-adolescent Muslim girls and boys both experience religious segregation in their friendship networks. However, the reasons for this segregation differed. Muslim boys were comparably open to interreligious friendships, but ended up segregated because non-Muslims were reluctant to become friends with them. By contrast, and even more clearly, Muslim girls were segregated due to their own in-group bias: Even though non-Muslims were more willing to befriend Muslim girls than boys, Muslim girls themselves tended towards making in-group friendships.

The observation of Muslim girls' pronounced in-group bias is consistent with the idea that there are strong endogamy norms among Muslim girls that not only prohibit interreligious romantic relationships, but also constrain *friendships* with non-Muslims (Carol 2014; Hennink et al. 1999). Similarly, non-Muslim youths' stronger reluctance to make friends with Muslim boys is consistent with the suspicion that Muslim boys face specific stereotypes that complicate their interreligious friendships—in particular, stereotypes of danger, violence, and oppressiveness, which non-Muslims tend to connect with Muslim men rather than women (Archer 2009; Erentzen et al. 2022; Fourgassie et al. 2023).

However, the previous chapter has only provided a *snapshot* of religious friendship segregation in adolescence. This is well in line with previous work on friendship-making between Muslim and non-Muslim youth, which is either cross-sectional (Simsek et al. 2022; Windzio & Wingens 2014) or reports aggregate results from short-term panel studies (Leszczensky & Kretschmer 2022; Leszczensky & Pink 2017; Snijders & Kalter 2020, ; as well as the previous chapter). All these studies thus have a static perspective on religious segregation, documenting friendship-making at a specific point in time and leaving open the question of whether Muslim in-group bias and non-Muslim reluctance to make Muslim friends vary throughout the years of adolescence.

In this chapter, I move beyond this static perspective by examining how religious friendship-making develops throughout adolescence. I again differentiate between the perspectives of Muslim and non-Muslim youth and between the friendship-making of boys and girls. I argue that a dynamic and gender-specific perspective on Muslim in-group bias and non-Muslim reluctance is important for three main reasons.

First, if Muslim girls' in-group bias is indeed a consequence of endogamy norms and non-Muslims' reluctance towards Muslim boys a consequence of stereotypes, the importance of these gendered forces behind friendship segregation is likely to differ throughout adolescence. In childhood, romantic relationships are rare, but they become increasingly frequent and serious throughout

adolescence (Collins et al. 2009). Interreligious dating thus increasingly becomes a threat over the course of adolescence, and, accordingly, I expect gendered endogamy norms to constrain Muslim girls' friendship-making more and more as adolescence progresses. Stereotypes of danger and oppressive behavior also are more applicable to adult men—or youth close to adulthood—than to younger boys, so non-Muslims' reluctance towards friendships with Muslim boys may also increase as they age. These considerations suggest important dynamics of gendered interreligious friendship-making.

Second, Muslim in-group bias and non-Muslim reluctance may become *interdependent* over the course of a longer time frame. If, following gendered endogamy norms, Muslim girls increasingly focus on in-group friendships in adolescence, non-Muslims may react to this behavior by becoming weary of friendships with Muslim girls. Similarly, Muslim boys who face non-Muslim peers' reluctance to interact with them may over time start to express their frustration by retreating to in-group friendships as well. Capturing this potential interdependence of religious friendship-making requires a dynamic perspective.

Finally, understanding the temporal dynamics of religious friendship-making is important because friendships can provide very different resources at different points in time. Accordingly, a lack of interreligious friendships can have very different implications depending on when it surfaces. In early adolescence, when youth transition to secondary school and experience a new social surrounding, interreligious friendships may primarily help to foster a sense of community and positive school climate (Kornienko & Rivas-Drake 2022). At later points in time, however, these friendships can also become more important from an instrumental perspective. In late adolescence, for example, many youth face decisions about their educational trajectory or entry into the labor market, which have long-lasting consequences. In this period, having non-Muslim majority friends from families experienced with Western institutions (Kretschmer 2019) can provide Muslim adolescents with tangible benefits for their educational and occupational decisions (Lancee 2010; Kornienko & Rivas-Drake 2022). Conversely, a lack of interreligious friendships can block Muslim youths' access to information in this period of crucial decision-making. To better understand who faces these risks, moving beyond a static perspective and studying the dynamics of religious friendship segregation is important.

To investigate the development of gendered interreligious friendship-making throughout adolescence, I rely on six waves of longitudinal social network data from the Friendship and Identity in School project (Leszczensky et al. 2022). Employing both stochastic actor-oriented models for network evolution and growth curve models, I use this data to identify how gendered Muslim in-group bias and gendered reluctance of non-Muslims develops between the ages of 11

to 17.

In line with the expectation of gendered and age-dependent endogamy norms, the analyses show a considerable growth of Muslim girls' in-group bias over the course of adolescence. I also find an in-group bias among Muslim boys, but unlike girls' in-group bias, it proves to be stable throughout adolescence. Given the rise of Muslim girls' and the stability of Muslim boys' in-group bias, Muslim girls focus more strongly on in-group friendships than boys by mid-to-late adolescence, in line with findings from the previous chapter.

Among non-Muslim youth, I find no substantial variation in friendship-making over time, neither concerning non-Muslims' friendships with Muslim boys nor girls. Along the lines of the previous chapter, both non-Muslim boys and girls are reluctant to be friends with Muslim boys, but deviating from the findings in Chapter 2, they also are reluctant to be friends with Muslim girls. The extent of reluctance towards Muslim boys and Muslim girls is similar and remains stable over the adolescent years.

3.2 Theory

Friendship segregation between Muslim and non-Muslim youth can result both from a *Muslim in-group bias* and a *reluctance of non-Muslims* towards friendships with Muslim adolescents. In the previous chapter, I have highlighted that both in-group bias and reluctance can be gender-specific. Due to gendered endogamy norms that not only complicate interreligious romantic relationships (Carol & Teney 2015; Clycq 2012; Hennink et al. 1999), but also friendships (Carol 2014), in-group bias may be stronger among Muslim girls—an expectation supported by the empirical analysis from Chapter 2. Due to gendered stereotypes that portray male but not female Muslims as dangerous, violent, and oppressive (Archer 2009; Erentzen et al. 2022; Fourgassie et al. 2023), non-Muslims may be particularly reluctant to make friends with Muslim boys rather than girls—a gender difference that also surfaced in the analyses in Chapter 2. However, in-group bias and reluctance are also likely to not only be *gender*-but also *age-specific*, differing in their impact on interreligious friendships throughout the adolescent years.

3.2.1 Puberty and the Rising Salience of Gendered Endogamy Norms in Adolescence

The primary targets of endogamy norms are Muslim adolescents' *romantic relationships*, with gendered endogamy norms disapproving of girls' interreligious dating in particular (Carol & Teney 2015; Cila & Lalonde 2014; Clycq 2012).

If endogamy norms also affect friendship-making, this is due to spillover effects: Friendships with non-Muslim boys can be—or be perceived as—a first step towards interreligious romantic relationships. In addition, friendships with non-Muslim girls can facilitate closer contact with non-Muslim boys or lower standards on interreligious and cross-gender interaction more generally (Hawkey et al. 2018; Hennink et al. 1999; Zine 2001).

Due to their link to romantic relationships, endogamy norms are likely to differ in their consequences for interreligious friendship-making throughout adolescence. Prior to the onset of puberty, there hardly are any (serious) romantic relationships, so there is no reason to expect endogamy norms to constrain Muslim youths' in- and out-group interaction in this period (Scourfield et al. 2013). However, once puberty looms and romantic interest sparks (Collins et al. 2009), endogamy norms become increasingly salient. For Muslim girls, puberty marks the transition to being an accountable member of the religious community, which further highlights the importance of conforming to religious norms (Abo-Zena 2019; Scourfield et al. 2013). In this period, gendered endogamy norms are thus likely to start to regulate Muslim girls' interreligious relationships. As adolescence progresses and romantic relationships become more frequent and serious (Carver et al. 2003), regulation based on these norms is likely to further intensify. On top of endogamy norms, other restrictions on romantic relationships can also constrain adolescent Muslim girls' interreligious friendships. This holds true for chastity norms in particular, which oppose premarital sexual activity and, like endogamy norms, are both widespread and gendered among Western Muslims (Hawkey et al. 2018; Hendrickx et al. 2002; Saharso et al. 2023). As most non-Muslim youth do not share these norms (Kogan & Weißmann 2020; Yip & Page 2016), Muslim girls and their parents are sometimes afraid that close interaction with non-Muslims bears a risk of negative peer influence and lowering the standards of cross-gender interaction (Hawkey et al. 2018; Hennink et al. 1999; Zine 2001).

Supporting these considerations on age-specific norm influence, past qualitative research highlights that the constraints imposed on Muslim girls strongly depend on their age and development. Prior to adolescence, interreligious and cross-gender involvement is frequently considered unproblematic (Basit 1997b; Scourfield et al. 2013). After the onset of adolescence, however, both the external and self-regulation of Muslim girls' leisure time, extracurricular activities, and interreligious interaction increases (Basit 1997b; Hennink et al. 1999; Stodolska & Livengood 2006). Accordingly, Muslim girls' in-group bias is likely to increase as adolescence progresses.

For Muslim boys, norms on romantic relationships tend to be weaker (Buunk & Dijkstra 2017; Hanassab 1998; Hendrickx et al. 2002), so normative regulations

are unlikely to substantially shift their in-group bias. However, findings from the previous chapter suggest a potential alternative reason why Muslim boys' in-group bias may rise in adolescence. In Chapter 2, non-Muslim youth were strongly reluctant to become friends with Muslim boys, while their reluctance was comparatively lower in terms of befriending Muslim girls. If Muslim boys experience this reluctance for a longer time span, their openness to interreligious friendships may dwindle as well. Over time, non-Muslim reluctance and Muslim in-group bias thus may become *interdependent*.

3.2.2 Stereotypes and Competition: The Development of Non-Muslims' Reluctance towards Muslim Boys

Like Muslim in-group bias, non-Muslims' reluctance to friendships with Muslim boys and girls may change during adolescence. In the previous chapter, I found mid-adolescent non-Muslims to be notably more reluctant towards friendships with Muslim boys than Muslim girls and suggested this to potentially be a consequence of the strong and negative stereotypes that male Muslims face in Western societies. Most of the stereotypes that label male Muslim as "anti-social" (Fourgassie et al. 2023) refer to non-Muslims' fear of danger, violence, and oppression (Archer 2009; Erentzen et al. 2022; Fourgassie et al. 2023). Therefore, they primarily concern characteristics associated with *adults* rather than *children*. As Muslim boys pass through adolescence and approach adulthood, non-Muslims may thus increasingly stereotype Muslim boys in terms of these characteristics, suggesting deteriorating outgroup attitudes and an increasing reluctance over time.

The subordinate male target hypothesis, which more generally predicts stronger negative attitudes and behavior towards minority men than women (Purdie-Vaughns & Eibach 2008), implicitly suggests a similar trajectory. According to the hypothesis, rejection of minority men follows from the majority's expectation of competition for material and symbolic resources with minority men rather than women. This competition is most likely to arise when adolescents come closer to claiming important material and symbolic resources over time. In late adolescence, for example, competition for access to further education or valued positions in the labor market may become salient. Competition for symbolic resources may also gather pace as youth increasingly gain influence in their families and communities as they age. Finally, the subordinate male target hypothesis suggests that majority women may reject men due to fear of sexual coercion (Navarrete et al. 2010), which becomes more applicable as out-group members grow older.

3.2.3 Diverging Interests, Veiling, and Non-Muslims' Reluctance towards Muslim Girls

While changing stereotypes and competition suggest an increase in non-Muslim youths' reluctance to make friends with Muslim *boys* as adolescence progresses, reluctance towards Muslim *girls* may also rise over time.

A key reason why non-Muslims may become less open to friendships with Muslim girls is a divergence in interests and priorities in adolescence. Among the largely secular non-Muslim youth, adolescence comes with an interest in both romantic relationships and independent unsupervised activities, such as going out, attending parties, and mingling with same- and cross-gender peers (Collins et al. 2009; Hennink et al. 1999). Caught in a conflict between norms on female chastity and modesty, and the desire to live a "normal" teenage life (Grønli Rosten & Smette 2023; Seward & Khan 2016), many Muslim girls have a more ambivalent stance on these activities compared to both non-Muslims and Muslim boys (Abo-Zena 2019; Giuliani et al. 2017). At the same time, they are also more strongly regulated by their parents and religious community (Basit 1997b; Grønli Rosten & Smette 2023; Hennink et al. 1999). Given this—perceived or actual—lack of joint interests and the restrictions Muslim girls face, non-Muslim youth may see fewer points of contact for friendships with Muslim girls as adolescence progresses.

This process is further reinforced for Muslim girls who start to *veil* in adolescence (Abo-Zena 2019; Pfündel et al. 2020). As a salient marker of religiosity (Haug et al. 2009), non-Muslims may perceive the headscarf as a clear signal of diverging values and lifestyles (Abo-Zena 2019; Choi et al. 2023), which lowers interest in friendships with Muslim girls. In addition, Muslim girls may face more explicit discrimination and rejection when they start to veil. Veiling has become a highly divisive issue in Western societies as well as the quintessential symbol of Muslim otherness (Halm & Sauer 2017; Helbling 2014). Accordingly, Muslim women who veil face unfavorable treatment across various contexts and domains, ranging from reduced helping behavior (Aidenberger & Doehne 2021; Choi et al. 2019) to discrimination in the labor market (Fernández-Reino et al. 2022; Weichselbaumer 2020) and harassment (Chakraborti & Zempi 2012). In the context of friendship-making, this rejection thus may be visible in an increasing reluctance of non-Muslim youth to make friends with Muslim girls as they start to veil in adolescence.

Finally, a shift in reluctance towards adolescent Muslim girls may also be a reaction to the in-group bias Muslim girls themselves are expected to develop due to gendered endogamy norms. If non-Muslims perceive Muslim girls to increasingly make friends amongst each other as adolescence progresses, they

may also abstain from initiating friendships with them in return. While the previous chapter did not suggest Muslim girls' in-group bias to be mirrored in a reluctance of non-Muslims to make friends with them, an interdependence of these friendship-making processes may emerge in the long run.

3.2.4 Considering the Baseline: Trajectories of Out-Group Attitudes in Adolescence

So far, all expectations surrounding the dynamics of in-group bias and out-group reluctance have been specific to relations between Muslim and non-Muslim youth in the West. However, obtaining accurate predictions on how friendship-making changes in adolescence also requires establishing more general developmental trends of intergroup relations, which may operate on top of the specifics of Muslim-non-Muslim interaction.

While there is no established literature on how exactly intergroup friendship-making develops in adolescence, there is evidence on the trajectories of intergroup attitudes and prejudice, which are tightly linked to friendship-making (Binder et al. 2009; Davies et al. 2011; Pettigrew & Tropp 2006). Specifically, there are two meta-analytical studies that summarize insights from previous research on the development of adolescents' intergroup attitudes and prejudice over the adolescent years (Crocetti et al. 2021; Raabe & Beelmann 2011). Convergingly, both studies show that attitudes are stable in adolescence, with no evidence for either an upward or downward trend over time (Crocetti et al. 2021; Raabe & Beelmann 2011).

Given the tight link between intergroup attitudes and outgroup friendships, these meta-analytical findings have two main implications for the considerations in this chapter. First, they do not suggest that there are substantial *general* changes in intergroup friendship-making on top of the specific dynamics between Muslims and non-Muslims established above. Accordingly, these dynamics are likely to accurately capture the overall direction of adolescents' friendship-making trajectories. Second, these findings ground expectations on the strength of change in religious friendship-making in adolescence, particularly if predictions of change are based on the assumption of shifting intergroup attitudes, which these meta-analytical studies indicate to be time-stable.

Above, I addressed changes in intergroup attitudes primarily in relation to non-Muslims' reluctance towards friendships with Muslim boys and of Muslim boys' own in-group bias. For non-Muslim reluctance, I expected increasing stereotypes towards and competition with Muslim boys to worsen intergroup attitudes and decrease openness towards interreligious friendships. For Muslim

boys, I argued that intergroup attitudes may deteriorate as a reaction to non-Muslim's increasing reluctance. If, as suggested by the overall lack of change in intergroup attitudes in adolescence, trends like these are either weakened or compensated by other developmental processes, the change in Muslim boys' in-group bias and non-Muslims' reluctance towards Muslim boys may thus be minor.

By contrast, I predicted a rising in-group bias among Muslim girls based on increasingly salient gendered religious norms rather than changes in intergroup attitudes, so this expectation does not contradict the meta-analytical findings. To a lesser degree, this also applies to a potential increase in non-Muslims' reluctance towards friendships with Muslim girls, which I at least partially attributed to diverging interests between Muslim girls and non-Muslim youth. Considering previous findings on the development of intergroup attitudes, trajectories of Muslim girls' in-group bias and non-Muslims' reluctance towards friendships with Muslim girls are thus likely to be more dynamic than those among boys.

3.3 Data and Methods

3.3.1 Data

To investigate how the interreligious friendship-making of Muslim and non-Muslim youth develops during adolescence, I use data from the *Friendship and Identity in School* (FIS) project (Leszczensky et al. 2022). Across six waves of data collection from 2012 to 2017, FIS surveyed students in ten religiously diverse secondary schools in the German federal state of North Rhine-Westphalia. All schools were either lower secondary, intermediate secondary, or comprehensive schools. The study assessed both students' individual characteristics and their friendship networks at the grade level (academic year). In each wave, students filled out paper-and-pencil questionnaires during two lessons in class.

In the first wave, all students in the fifth, sixth, and seventh grades in each school were surveyed. The students in the three starting cohorts were 11-12, 12-13, and 13-14 years old, respectively. They were surveyed for up to six waves, with subsequent waves about 9 months apart. Therefore, students were 15-16, 16-17, and 17-18 years old by the time of the sixth wave. Five schools participated in all six waves, one school participated in the first five waves only, and the remaining four schools participated in the first three waves only.

3.3.2 Variables

Friendship Networks. Students were presented with a roster of all peers in their grade, visually separated by classroom. They could nominate up to ten of their best friends. These directed friendship nominations constitute the grade-level friendship networks that I use to investigate religious friendship-making.

Age, gender, religion. Students self-reported their year and month of birth. Based on this information, I calculate their (monthly) age at the time of each wave. For gender, students indicated whether they were male or female.[1] Concerning religion, students could choose from the largest religious groups in Germany (Catholic, Protestant, and Muslim), but they could also indicate other religious affiliations or that they had no religion. 98% of the non-Muslim students in the sample were either Christian (76%) or had no religious affiliation (22%). Previous work using the FIS data has shown Christian and non-religious youth to be similarly reluctant to becoming friends with Muslim youth (Leszczensky & Pink 2017), so I only differentiate between Muslims and non-Muslims in the analysis.[2]

Control variables. In Germany, being Muslim is correlated with both ethnic and socioeconomic background, as almost all German Muslims are descendants of immigrants. Therefore, I account for students' *ethnic background*, relying on self-reported information on students' own as well as their parents' and grandparents' countries of birth. I thus capture first-, second-, and third-generation immigrants and their respective countries of origin, following the classification approach by Dollmann et al. (2014). To account for students' socioeconomic background, I measure *parental occupational status* by the ISEI score according to the occupations that students indicated their parents to have, averaged over both parents and all waves. Finally, to capture different *opportunities* to befriend different schoolmates, I consider which *elementary school* respondents attended, the *neighborhood* they lived in, and their *classroom* within the school grade. Sharing these contexts with peers provides better opportunities for interaction and thus friendship.

[1] Students indicated their gender and religion in each wave. 97.5% of the respondents indicated the same gender across waves and 96% of the respondents consistently indicated to be either Muslim or non-Muslim. For the small number of students who reported different genders or religious affiliations over time, the pattern of answers in most cases suggests measurement error in single waves, i.e., respondents reported a consistent gender or religion in all but one wave. Therefore, I treat gender and religion as time-constant and, if students provided different answers across waves, I use the gender and religion indicated most frequently.

[2] In a robustness check, I further distinguished between *Christian* and *other* non-Muslims. While estimates concerning other non-Muslims (the smallest group) were very imprecise, the analyses replicated the main findings on gender- and age-specific religious friendship-making.

3.3.3 Methods

To investigate how religious friendship-making develops in adolescence, I use two different analytical strategies with different yet complementary strengths. Like in the previous chapter, I use *stochastic actor-oriented* models (SAOMs) for network evolution to comprehensively model network evolution over time. This allows me to disentangle different mechanisms behind the change in friendship networks and to account for the interdependencies between students' friendship-making choices (Snijders et al. 2010). Given these benefits, SAOMs are ideally suited to assessing how Muslim in-group bias and non-Muslim reluctance develop over the adolescent years. Due to strict data requirements, however, I can only estimate SAOMs for a subset of the full sample with sufficiently low student non-response in all waves. The smaller sample and complex model also constrain me to estimating only linear variation in religious friendship-making by age, so I cannot identify more fine-grained trends in the SAOM analysis.

To address these limitations, I follow up on the SAOM analysis with *growth curve models* (GCMs) that assess age differences in the religious composition of students' friendship networks. Unlike SAOMs, GCMs have not been developed for network applications specifically but are a more general regression-based approach to assessing intertemporal change (Brüderl et al. 2019). Also in contrast to SAOMs, GCMs treat observations as independent and can thus neither account for the interdependencies between students' friendship choices nor the more general network processes that can reinforce friendship segregation. Therefore, they model the evolution of friendship networks less comprehensively than SAOMs. However, their key advantage is that they allow for an investigation of the entire FIS sample, thus providing higher statistical power and allowing me to assess intertemporal variation in religious friendship-making in greater detail. Given the differences between the analytical approaches and their distinctive advantages, converging findings across the SAOM and GCM analysis support robustness of the results. Below, I describe the setup of both SAOMs and GCMs in more detail.

Stochastic Actor-Oriented Models For Network Evolution (SAOMs)

Like in Chapter 2, I use *stochastic actor-oriented models* (SAOM, Snijders et al. 2010) to identify religious friendship-making tendencies net of opportunities, relational mechanisms, and other potential confounders. SAOMs require multiple observations of social networks and investigate change in networks with an agent-based simulation approach. In this chapter, I consider networks that have been observed five times across five waves of longitudinal data, so I can model four transitions between subsequently observed networks. This longer

panel (compared to only two waves in the previous chapter) allows me to assess how in-group bias and out-group reluctance develop with students' age. Subsequently, I elaborate on the specification of the SAOMs, sample selection, and estimation procedure.

Specification of SAOMs Similar to Chapter 2, I capture Muslim in-group bias and non-Muslims' reluctance to make Muslim friends with the combination of the *Muslim ego*, *Muslim alter*, and *Muslim ego* $\times$ *Muslim alter* effect, with corresponding parameter values $b_{Muslim\ ego}$, $b_{Muslim\ alter}$, and $b_{Muslim\ ego \times Muslim\ alter}$. As derived in more detail in the previous chapter, I capture Muslim in-group bias with the linear combination $b_{Muslim\ alter} + b_{Muslim\ ego \times Muslim\ alter}$ and non-Muslims' reluctance by $-b_{Muslim\ alter}$.

To capture gender differences in in-group bias and reluctance, I interact all three effects with the *Girl ego* effect; to further capture variation between friendship-making with girls and boys, I interact them with the *Girl alter* and *Girl ego* $\times$ *Girl alter* effect. Finally, extending the analysis from the previous chapter, I interact all effects with an *Age ego* effect to assess how religious friendship-making varies by age.

I include several additional effects to account for other characteristics that shape friendship formation and might bias the estimates of Muslim in-group bias and non-Muslim reluctance. Specifically, I model whether respondents have the *same ethnic background* and *similar parental occupational status* (measured by family members' country of birth and parents' ISEI scores, as explained above). For parental occupational status, I also account for whether students with high parental occupational status had more friends (*parental occupational status ego* effect) or were named more often as friends by others (*parental occupational status alter* effect).[3] I capture the predominance of same-gender over cross-gender friendships with the *Girl ego*, *Girl alter*, and *Girl ego* $\times$ *Girl alter* effect.

To consider the different opportunities adolescents have to make friends with their different schoolmates, I account for whether students attended the *same elementary school*, lived in the *same neighborhood*, and were part of the *same classroom* (rather than of a different classroom in the same grade).

Finally, I consider how *relational mechanisms* shape friendships (Snijders et al. 2010). Adolescents tend to reciprocate the friendship nominations of others, which I capture with the *reciprocity* effect. They also tend to become friends with their friends' friends, which I capture with the *geometrically weighted edgewise-shared partner (GWESP)* effect. I include an interaction effect of the *reciprocity* and *GWESP* effect to account for the fact that transitive closure tends

[3]Given the large number of different ethnic backgrounds among students, I do include ego and alter effects for this characteristic.

to differ between reciprocated and unreciprocated relationships. Finally, I model network density with the *outdegree* effect, and I capture dispersion and covariation of outgoing and incoming friendship nominations with the *outdegree-activity*, *indegree-popularity*, and *indegree-activity* effects, following the standard recommendations for modeling network evolution (Ripley et al. 2023).

Sample Selection for the SAOM Analysis Estimating the development of religious friendship-making in the adolescent years requires a long-term assessment of change in friendship networks. Accordingly, I only include networks in the SAOM analysis that were observed for all of the first five waves of the survey, which leaves a sample of 17 (of a total of 29) networks.[4] In the SAOM analysis, missing information about students' friends must be limited to avoid misrepresenting the actual friendship network (Huisman & Steglich 2008; Snijders et al. 2010). I thus limit the analysis to the 13 grade-level networks with less than a 30% non-response rate in all five waves.[5] Finally, I exclude two networks with too few Muslim students to estimate religion- and gender-specific effects. Therefore, the SAOM analysis is based on 11 grade-level networks that consist of 1,165 students in total. Table 3.1 provides a descriptive overview of the sample. In the first wave, students were on average 12.5 years old. With an average of nine months between waves, the average age increased by about nine months between subsequent waves. Across all waves, half of the students in the analysis sample were female and male, and about 30% of students self-identified as Muslim. Among Muslims, a slight majority of students was female, while slightly more than half of the non-Muslim students were male. I provide further details on the 11 included networks in Table B.1 in the appendix.

Implementation and Estimation Using the model specification above and the RSiena package (Version 1.2-25), I estimate separate SAOMs for all 11 grade-level networks (Ripley et al. 2023). Unlike in Chapter 2, the separate networks are thus not combined into in a single multilevel model prior to the analysis, because each network is sufficiently large to estimate effects separately. Instead, I obtain average effects across the networks post-estimation by using multivariate

[4]To ensure identical model specifications and comparability across networks, I do not use data from the sixth wave, even for those networks that were surveyed.

[5]The cutoff applies to all waves, so I excluded a network if the proportion of unit non-response exceeds 30% in any wave. Reanalysis with a cutoff of 25%, which reduces the sample to seven networks, yields substantively identical results.

Table 3.1: Sample of SAOM Analysis

Wave	1	2	3	4	5
# Grade-level networks	11	11	11	11	11
# Students in grade	966	1,007	994	996	1,000
# Students participating	782	838	884	907	835
Mean # students per prade	87.82	91.55	90.36	90.55	90.91
Mean # students participating per grade	71.09	76.18	80.36	82.45	75.91
Mean age	12.54	13.25	14.01	14.87	15.55
Share girls	0.51	0.51	0.51	0.50	0.50
Share Muslim	0.28	0.29	0.29	0.29	0.28
Share Muslim girls	0.16	0.16	0.16	0.16	0.15
Share Muslim boys	0.13	0.13	0.13	0.13	0.13
Share Non-Muslim	0.72	0.71	0.71	0.71	0.71
Share Non-Muslim girls	0.35	0.35	0.35	0.34	0.35
Share Non-Muslim boys	0.36	0.36	0.36	0.37	0.37

random-effects meta-analysis with a restricted maximum-likelihood estimator on the network-specific parameter estimates (An 2015).[6]

To account for students who joined or left their grade and thus the network between waves, I used the method of *joiners* and *leavers* implemented in RSiena (Ripley et al. 2023; Huisman & Snijders 2003). Missing information due to unit- or item non-response is treated by RSiena's internal imputation routines, which aim to minimize the impact of missing observations on estimation results (Huisman & Steglich 2008; Ripley et al. 2023). I ran all analyses with unconditional estimation, uncentered covariates, and 3,000 iterations in the final phase of estimation. All reported network models meet standard convergence criteria, with the overall convergence criterion below .25 and convergence t-ratios for individual parameters below .1 (Ripley et al. 2023). In the analysis that assesses gender-specific in-group bias and reluctance, SAOMs converge for all 11 networks in the sample; in the analysis that further differentiates between friendships with boys and girls, SAOMs converge for 8 of the 11 networks.

Growth Curve Models (GCMs)

The simulation-based SAOM analysis decomposes network evolution into students' repeated decisions to initiate new friendships, dissolve existing friendships, or leave friendship networks unchanged. By contrast, GCMs are a classic

[6]The main advantage of estimating SAOMs separately for each network is that all parameters can vary freely between networks. By contrast, the multilevel models used in Chapter 2 require assuming some parameters to be identical between networks.

regression-based approach to estimating intertemporal development, thus requiring a dependent variable that more directly captures religious friendship-making for each adolescent and each point in time. In this chapter, this dependent variable is students' *excess segregation*, which captures friendship segregation above and beyond the opportunity structure provided by the network context (i.e., the grade). For a *Muslim* student, excess segregation is the proportion of Muslim students among her friends minus the proportion of Muslim peers in the grade network (excluding the student herself). A positive excess segregation corresponds to a Muslim *in-group bias*, as it indicates that Muslim students have more Muslim friends than expected from the network-level opportunity structure. Similarly, excess segregation for a *non-Muslim* student is the proportion of non-Muslim friends minus the proportion of non-Muslim peers at the grade level. Accordingly, a positive excess segregation indicates a *reluctance* of non-Muslims to become friends with Muslims.

Excess segregation among Muslim and non-Muslim youth can change as friendship networks change, and the GCMs track how excess segregation develops with adolescents' age. I model change in excess segregation over time by including dummies for each full year of age, rounding the detailed age information to full years. This permits a more fine-grained assessment of variation in religious friendship-making than in the SAOMs, which are constrained to a linear age effect due to limited sample size and model complexity.

In the GCM analysis, I include data from all 10 schools, 29 grade-level networks, and all students aged 11-17,[7] with a total of $N = 2,451$ students included.[8] Table 3.2 provides a descriptive overview of the GCM sample. In terms of all characteristics, the GCM sample is very similar to the SAOM sample shown in Table 3.1.[9]

I report results from GCMs with individual-level fixed effects, which estimate the development of excess segregation by age based on within-individual variation only (Brüderl et al. 2019). Next to school and grade differences, individual-level fixed effects thus account for any time-stable differences between students that are not explicitly included in the model, such as students' personality traits. Therefore, fixed-effects GCMs are more robust to confounding

[7]There are too few students who were younger than 11 or older than 17 to obtain accurate estimates outside of this age range.

[8]This number is larger than the wave-specific number of participating students in Table 3.2, because some students only took part in the survey in a subset of the waves. The number of participating students is much lower in waves 4-6 than in waves 1-3 because four schools only participated in the first three waves of the study.

[9]Other than for waves 1-5, Table 3.2 shows that average age between waves 5 and 6 differed by less than nine months. This is because the oldest students, who were in seventh grade in the first wave, had already completed schooling by the time of wave 6 and no longer participated in the survey.

Table 3.2: Sample of GCM Analysis

Wave	1	2	3	4	5	6
# Schools	10	10	10	6	6	5
# Grade-level networks	29	29	29	17	17	10
# Students participating	1,618	1,897	1,970	1,181	1,047	660
Mean # students participating per grade	55.79	65.41	67.93	69.47	61.59	66.00
Mean age	12.82	13.46	14.21	14.95	15.48	15.75
Share girls	0.48	0.47	0.47	0.47	0.47	0.48
Share Muslim	0.33	0.32	0.32	0.28	0.28	0.29
Share Muslim girls	0.17	0.16	0.17	0.15	0.15	0.16
Share Muslim boys	0.16	0.16	0.15	0.13	0.13	0.13
Share Non-Muslim	0.67	0.68	0.68	0.72	0.72	0.71
Share Non-Muslim girls	0.32	0.31	0.31	0.32	0.32	0.33
Share Non-Muslim boys	0.36	0.37	0.37	0.40	0.40	0.39

than random-effects GCMs, which also estimate change from between-student variation in excess segregation. However, results on intertemporal variation are similar in random-effects GCMs, and I consider random-effects GCMs in more detail in Chapter 4.

3.4 Results

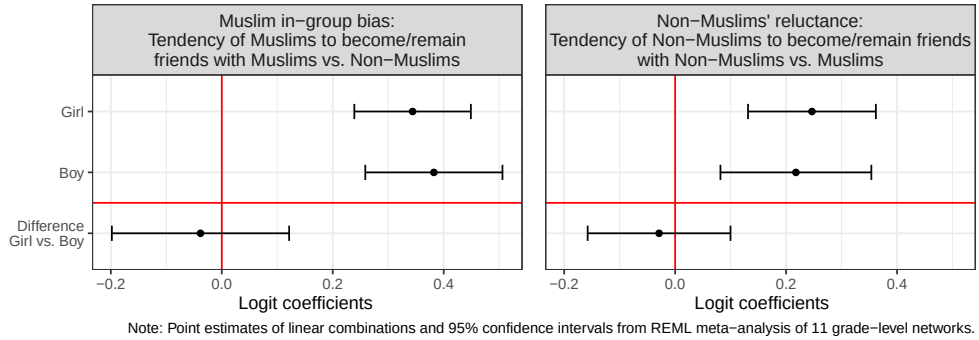
I discuss the empirical results in three steps. Relying on SAOMs that *do not* differentiate age-specific dynamics of religious friendship-making in adolescence, I first reproduce the analysis on gender-specific friendship-making from the previous chapter to document consistent and discrepant results. Then, I proceed to an age-differentiated SAOM analysis to assess how religious friendship-making develops over the adolescent years. Finally, I illustrate the robustness of these age-specific patterns with a GCM analysis of the full sample.

3.4.1 Static SAOM Analysis: In-Group Bias And Reluctance without Differentiation by Age

Two main gender-specific findings characterized the previous chapter. First, Muslim in-group bias was stronger among girls than boys. Second, non-Muslim boys and girls were both reluctant to make non-Muslim friends, but reluctance was only strong towards Muslim boys and almost negligible among Muslim girls. Do these gendered patterns reappear in the FIS data when pooling across all waves?

To assess this, Figure 3.1 displays in-group bias among Muslim boys and girls and non-Muslim boys' and girls' reluctance to be friends with Muslims, as

Figure 3.1: Gendered Muslim In-Group Bias and Non-Muslim Reluctance. Predictions from Static SAOM Analysis



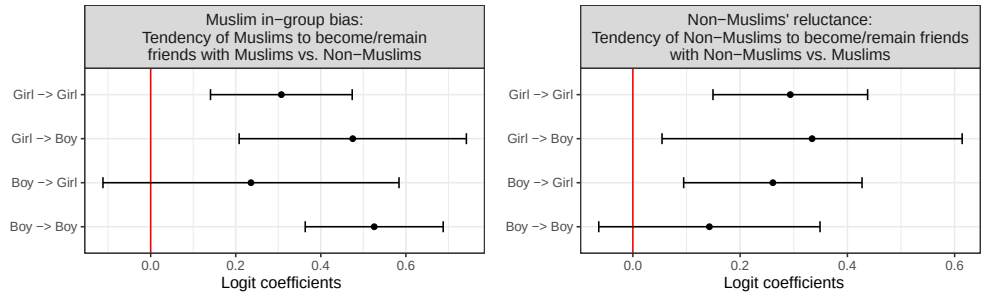
estimated from a SAOM without age-specific effects (see Appendix B.2, Table B.2 for full model results). The left panel of Figure 3.1 shows that, in this aggregate analysis, both Muslim girls and Muslim boys exhibit an in-group bias ($p < .01$). However, other than in the previous chapter, estimates are very similar for boys and girls, so there no evidence of a stronger in-group bias among Muslim girls.

For non-Muslim youth, the right panel of Figure 3.1 shows that both non-Muslim boys and girls are reluctant to be friends with Muslim youth ($p < .01$), and, in line with findings from Chapter 2, this reluctance does not vary by gender. Instead, Chapter 2 suggested that non-Muslim youth—boys and girls alike—are reluctant to make friends with Muslim *boys* but more open to friendships with Muslim *girls*. To determine whether this gendered pattern also surfaces in the FIS data, Figure 3.2 further differentiates between in-group bias and out-group reluctance in adolescents' friendships with boys and with girls (see Appendix B.2, Table B.3 for full model results).

According to the right panel of Figure 3.2, there are no clear-cut differences in non-Muslim youths' reluctance towards Muslim boys and girls. Other than in Chapter 2, non-Muslims seem to be just as reluctant to make friends with Muslim girls as with Muslim boys. With reluctance towards Muslim boys not significant among non-Muslim boys, there even is some indication that non-Muslim boys are *more* open to friendships with Muslim boys than Muslim girls; this difference, however, is not statistically significant ($p > .1$). For both non-Muslim boys and girls, reluctance towards Muslim *girls* is statistically significant ($p < .05$), as is non-Muslim girls' reluctance towards Muslim boys ($p < .05$). All three effects are similar in size.

For Muslim girls, the left panel of Figure 3.2 suggests an in-group bias both in relationships with girls and boys ($p < .05$), with a trend towards a stronger bias in friendships with boys. Among Muslim boys, in-group bias also tends

Figure 3.2: Gendered Muslim In-Group Bias and Non-Muslim Reluctance in Friendships with Boys and Girls. Predictions from Static SAOM Analysis



to be stronger in friendships with boys. In friendships with girls, Muslim boys' in-group bias is not statistically significant.

To summarize, the findings from Figures 3.1 and 3.2 appear to be inconsistent with the gender-specific patterns of Muslim in-group bias and non-Muslim reluctance documented in the previous chapter: In the FIS data, there is no evidence of a stronger in-group bias among Muslim girls than boys; there also is no evidence of a stronger reluctance among non-Muslims to be friends with Muslim boys compared to girls. However, a key difference between these analyses is that Chapter 2 refers to friendship-making among 15–16-year-old adolescents, while the present analyses aggregate over the entire range of the adolescent years. Accordingly, one reason for the diverging findings may be that the patterns observed in Chapter 2 only *develop* as adolescence progresses.

3.4.2 Dynamic SAOM Analysis: The Development of In-Group Bias and Out-Group Reluctance in Adolescence

To show how religious friendship-making evolves over the adolescent years, Table 3.3 and Figure 3.3 summarize results from a SAOM analysis that assesses how in-group bias and out-group reluctance vary with students' *age* (see Appendix B.2, Table B.4 for full model results). Table 3.3 displays estimates of the *age gradient*, which represents the predicted gender-specific change in in-group bias and out-group reluctance with each additional year of age. Figure 3.3 displays the predicted trajectory of religious friendship-making that follows from this age variation.

According to Table 3.3, only Muslim girls experience significant variation in religious friendship-making over the adolescent years. As Muslim girls grow older, their in-group bias increases ($p < .05$). For Muslim boys as well as both non-Muslim boys and girls, age gradients are not statistically significant in

Table 3.3: Age Gradient of Gendered Muslim In-Group Bias and Non-Muslim Reluctance. Predictions from Dynamic SAOM Analysis

	Muslim in-group bias		Non-Muslims' reluctance	
	Estimate	SE	Estimate	SE
Girls	0.13^{*}	(0.06)	-0.01	(0.05)
Boys	-0.04	(0.06)	0.01	(0.05)
Gender difference (Girls − Boys)	$0.18^{\dagger}$	(0.09)	-0.02	(0.07)

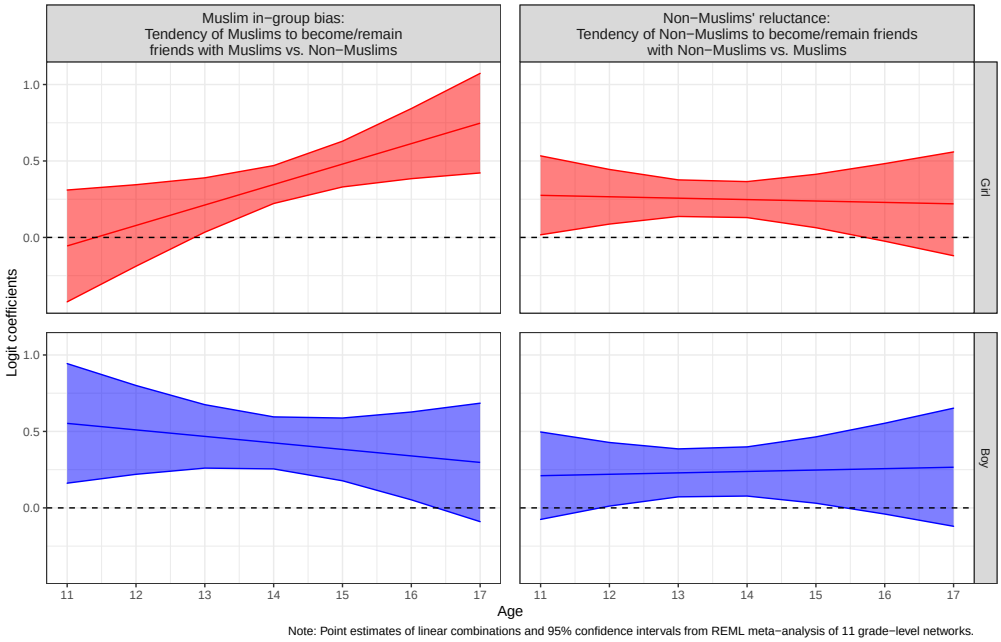
Note: $^{\dagger}p < .10$,* $p < .05$,** $p < .01$,*** $p < .001$. Results from REML meta- analysis based on 11 grade-level networks. Logit coefficients and standard errors (SE).

Table 3.3 ($p > .1$). With all point estimates close to zero, these findings suggest no variation in religious friendship-making over time for these youth.

This is mirrored in the age-specific predictions of in-group bias and out-group reluctance in Figure 3.3. The upper left panel of Figure 3.3 shows how Muslim girls' in-group bias develops in adolescence. At age 11, Muslim girls' in-group bias is still negligible, but it then rises steeply as adolescence progresses. At the same time, the in-group bias of Muslim boys (lower left panel) remains stable, and by mid-adolescence, Muslim girls' in-group bias exceeds that of Muslim boys, while continuing to rise further. Accordingly, the static analysis from Figure 3.1 masks substantial variation in Muslim girls' in-group bias over time. Accounting for this variation in Figure 3.3 resolves the inconsistency between this and the previous chapter in terms of Muslim girls' in-group bias: By the age of 15-16, Figure 3.3 shows Muslim girls' in-group bias to have surpassed that of Muslim boys. This age range is precisely what Chapter 2 focused on, finding stronger in-group bias among Muslim girls compared to boys as well. Among non-Muslims, Figure 3.3 instead highlights stable religious friendship-making throughout adolescence, as both Muslim girls and boys exhibit minimal changes in their reluctance to be friends with non-Muslims over time.

Does this stability persist when distinguishing between non-Muslim youths' friendships with boys and girls? To investigate this, Table 3.4 displays age gradients for a differentiated analysis that also assesses variation according to friends' gender (full model results in Appendix B.2, Table B.5). According to the right column of Table 3.4, this differentiated analysis does not provide indication of substantial intertemporal variation in non-Muslim reluctance either. There is a slight trend towards an increasing reluctance towards Muslim girls among both non-Muslim boys and girls, but none of the associated estimates are statistically

Figure 3.3: Gendered Muslim In-Group Bias and Non-Muslim Reluctance by Age. Predictions from Dynamic SAOM Analysis



significant ($p > .2$).[10] In terms of non-Muslims' reluctance towards boys, there is even less evidence of variation by age.

According to the left column of Table 3.4, Muslim boys also do not experience a shift in their in-group bias towards either boys or girls as they age. Accordingly, only Muslim girls experience a notable change in religious friendship-making in adolescence. Table 3.4 shows that this increase is concentrated in Muslim girls' friendships with *boys*, which become substantially more focused on the in-group as Muslim girls age ($p < .01$). Muslim girls' in-group bias in their friendships with girls rises as well, but this increase is more moderate. In fact, the corresponding age gradient is not statistically significant, though this is likely to be due to limited power in the more differentiated analysis from Table 3.4.[11] To illustrate how Muslim girls' in-group bias develops in their friendships with boys and girls, Figure 3.4 shows predictions based on the age

[10] The age gradient also does not become statistically significant in an analysis that pools the friendships of non-Muslim boys and girls together and only differentiates in terms of friends' gender.

[11] The age gradient for Muslim girls' friendships with girls in Table 3.4 is very similar to the aggregate point estimate in Table 3.3, which was statistically significant. As the estimates from Table 3.4 are based on eight networks only, this discrepancy in statistical significance is thus likely to be a consequence of limited power.

Table 3.4: Age Gradient of Gendered Muslim In-Group Bias and Non-Muslim Reluctance in Friendships with Boys and Girls. Predictions from Dynamic SAOM Analysis

	Muslim in-group bias		Non-Muslims' eeluctance	
	Estimate	SE	Estimate	SE
Girls → Girls	0.12	(0.10)	0.06	(0.06)
Girls → Boys	0.33**	(0.11)	−0.07	(0.11)
Boys → Girls	−0.13	(0.24)	0.13	(0.13)
Boys → Boys	−0.06	(0.09)	0.01	(0.07)

Note: $^{\dagger}p < .10$,* $p < .05$,** $p < .01$,*** $p < .001$. Results from REML meta- analysis based on 8 grade-level networks. Logit coefficients and standard errors (SE).

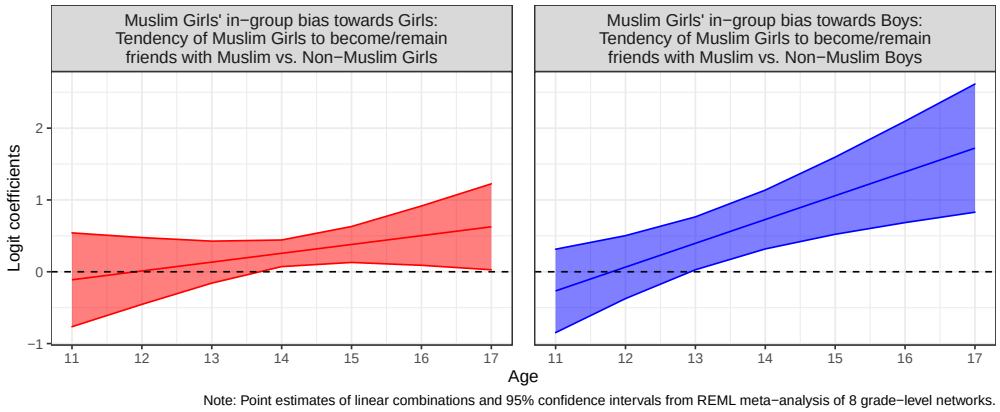
gradients from Table 3.4.[12] Muslim girls' in-group bias rises in both types of relationships, but it exhibits a stronger rise in friendships with boys.

To sum up, the SAOM analysis suggests that only Muslim girls experience substantial dynamics of religious friendship-making in adolescence. Among Muslim girls, in-group bias is negligible by age 11, but it rises continually and steeply afterwards. By mid-to-late adolescence, Muslim girls' in-group bias thus exceeds that of Muslim boys, in line with the findings from Chapter 2. The increase of Muslim girls' in-group bias is stronger in their friendships with boys, corresponding to expectations based on the evolution of endogamy norms as well as the findings from the previous chapter. By contrast, Muslim boys' in-group bias is already present in early adolescence and remains stable over the course of adolescence.

There is also no substantial variation in non-Muslims' reluctance to make Muslim friends over time, neither for friendships with boys nor girls. Instead of displaying intertemporal variation, non-Muslim youth were continually reluctant to be friends with Muslims, and this reluctance targeted Muslim boys and girls to a similar degree. This pattern thus diverges from findings in the previous chapter, which suggested non-Muslim youth to be more reluctant to be friends with Muslim boys than girls. Before returning to this discrepancy in the discussion, I next assess whether these intertemporal patterns reemerge in the full-sample GCM analysis.

[12] I do not show predictions for Muslim boys and non-Muslim youth for the differentiated analysis here (but display all trajectories in Appendix B.2, Figure B.1). As Table 3.4 shows, many of the age gradients are estimated with low precision, so confidence intervals for the predictions are large and the graphical display is not very informative.

Figure 3.4: Muslim Girls' In-Group Bias in Friendships with Boys and Girls by Age. Predictions from Dynamic SAOM Analysis

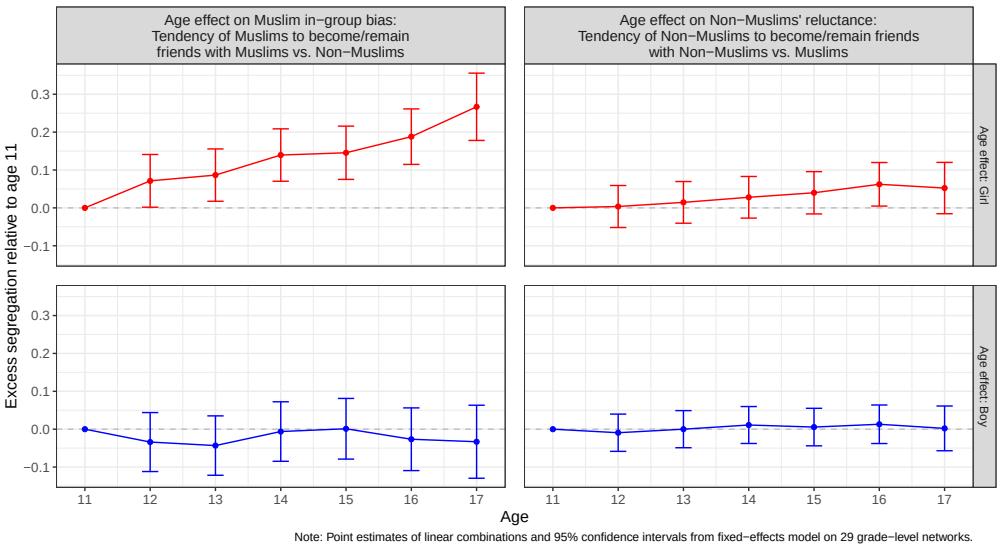


3.4.3 Fixed-Effects GCM analysis: A Power Boost and Robustness Check

While the SAOM analysis allowed me to comprehensively model network evolution, its strict data requirements forced me to rely on a limited analytical sample. By contrast, the fixed-effects GCMs that I report on next leverage the complete FIS sample, thus constituting both a robustness check and a power boost: By replicating the patterns identified in the SAOM sample, I ensure that the SAOMs do not misrepresent trends in the full sample. Furthermore, given the large sample, the GCMs provide sufficient power to identify age variation that was ambiguous in the SAOM analysis, and they can detect potential nonlinearities in the dynamics of friendship-making that could have been masked by the linear age effects in the SAOMs.

Figure 3.5 shows estimates on the variation of Muslim in-group bias and non-Muslims' reluctance by age from the fixed-effects GCMs (see Appendix B.3, Table B.6 for full model results). The fixed-effects GCMs capture how *excess segregation*, the tendency to have in-group friends beyond expectations from the network composition, changes within individuals over time. Figure 3.5 displays differences in excess segregation relative to age 11, which is the youngest age under consideration. According to Figure 3.5, Muslim girls' in-group bias rises consistently and approximately linearly with age ($p < .05$ relative to age 11 for all ages 12 and older), confirming results from the SAOM analysis. Results for Muslim and non-Muslim boys are also in line with the SAOM analysis, with no change in interreligious friendship-making visible. Among non-Muslim girls, there is a minor increase in reluctance, but variation is small in substantive terms, and only one of the age coefficients is statistically significant (age 16 relative

Figure 3.5: Age Effects on Gendered Muslim In-Group Bias and Non-Muslim Reluctance. Predictions from Fixed-Effects GCMs

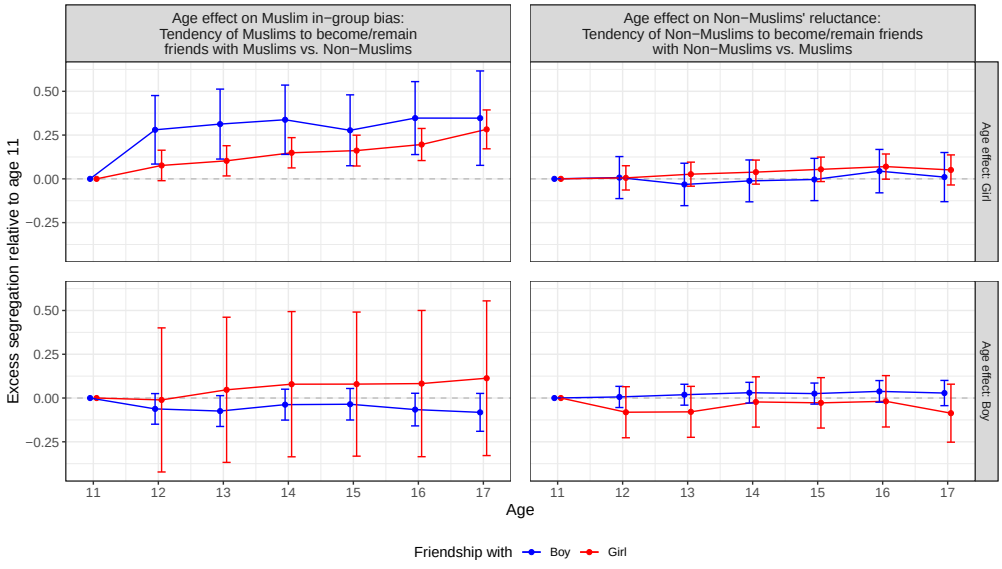


to age 11, $p < .05$). Like in the SAOM analysis, the only substantial change in religious friendship-making thus concerns Muslim girls, whose in-group bias increases as adolescence progresses.

Figure 3.6 provides a further breakdown of in-group bias and out-group reluctance in the friendship initiated by Muslim and non-Muslim youth, distinguishing between friendships with boys and girls (see Appendix B.3, Table B.7 for full model results). Similar to the SAOM analysis, Figure 3.6 suggests a stronger increase in Muslim girls' in-group bias in their friendships with boys compared to girls. It also highlights a differential temporal pattern of Muslim girls' in-group bias, which the linear age effect in the SAOMs could not capture: According to Figure 3.6, Muslim girls' in-group bias in friendships with boys increases abruptly in early adolescence ($p < .05$ for all ages greater than 11), while bias in friendships with girls changes more gradually. Still, this gradual increase in Muslim girls' in-group bias in friendships with girls also is statistically significant ($p < .05$ for all ages greater than 12, $p < .1$ for age 12). This lends support to the suspicion that the insignificant age gradient for Muslim girls' in-group bias in friendships with girls in the corresponding SAOM analysis was a result of limited power.

In line with the SAOM analysis, Figure 3.6 suggests no variation in Muslim boys' in-group bias or non-Muslim boys' reluctance by age, independent of whether friendships with boys or girls are considered. Finally, for non-Muslim girls, there is some indication of an increasing reluctance towards Muslim girls, but only one age coefficient is statistically significant (age 16 relative to age 11,

Figure 3.6: Age Effects on Gendered Muslim In-Group Bias and Non-Muslim Reluctance in Friendships with Boys and Girls. Predictions from Fixed-Effects GCMs



$p < .05$). Given the small substantive size of these effects, it is not possible to conclusively establish whether there is an increase in reluctance or not, but if there is an increase, it is small. Accordingly, the only group that experiences substantial and consistent change in religious friendship-making in adolescence is Muslim girls: Over the course of the adolescent years, Muslim girls' in-group bias rises, a finding that is highly robust in both the SAOM and GCM analyses.

3.5 Discussion

In Chapter 2, we have seen that Muslim youths' religious friendship segregation can emerge from both a Muslim in-group bias and a reluctance of non-Muslims to make Muslim friends. Both the in-group bias and reluctance also turned out to be *gendered*: In-group bias was notably stronger among Muslim girls, and non-Muslims were reluctant to be friends with Muslim boys, but much less so with Muslim girls.

In an extension of these considerations, this chapter asked whether in-group bias and out-group reluctance are not only gender-specific but also *dynamic* in the sense that they change as adolescence progresses. In the previous chapter, I have attributed Muslim girls' strong in-group bias to gendered endogamy norms that aim to prevent interreligious romantic relationships (Carol & Teney 2015; Clycq 2012) but can also complicate *friendships* with non-Muslims (Carol

2014). In this chapter, I expected Muslim girls' in-group bias to increase when they age, as romantic relationships become more widespread and serious as adolescence progresses (Collins et al. 2009), increasingly triggering endogamy norms. In a reaction to this increasing in-group bias, I also suggested that non-Muslims may become less open to friendships with Muslim girls. Diverging interests due to the norm-based regulations faced by Muslim girls and some Muslim girls' decision to veil can further intensify the reluctance non-Muslims may develop towards Muslim girls (Abo-Zena 2019; Basit 1997a).

At the same time, Muslim boys may also face a growing reluctance from non-Muslims, particularly as competition for resources intensifies in adolescence and strongly negative stereotypes (Archer 2009; Erentzen et al. 2022) are applied more and more to maturing Muslim boys. This reluctance, in turn, can lead to deteriorating intergroup attitudes among Muslim boys, who may therefore increasingly focus on in-group friendships as they progress through adolescence.

In this study, I empirically captured trajectories of religious friendship-making by studying six waves of friendship network data of 11–17-year-old Muslims and non-Muslims in German schools, using both stochastic actor-oriented models for network evolution and growth curve models.

Both methods consistently documented an increase in Muslim girls' in-group bias in adolescence, while Muslim boys' in-group bias remained stable. By the age of 11, Muslim girls' in-group bias was still negligible, but it then rose steeply over the adolescent years. Accordingly, Muslim girls' in-group bias exceeded that of Muslim boys by the age of 15, in line with the stronger in-group bias that the previous chapter documented for mid-adolescent Muslim girls. Muslim girls' in-group bias increased earlier and more steeply in their friendships with boys but gradually expanded to their friendships with girls as well. These findings are consistent with an influence of endogamy norms, which more strongly problematize Muslim girls' friendships with non-Muslim boys than with girls. An early increase in in-group bias in friendships with boys, as visible in the growth curve models, may indicate that interreligious cross-gender friendships become problematic as soon as romantic relationships become a possibility. By contrast, endogamy norms may constrain friendships with non-Muslim girls only later on, as these girls themselves start to engage in closer cross-gender interaction and dating (Collins et al. 2009; Hawkey et al. 2018; Hennink et al. 1999).

Like among Muslim boys, there was little evidence for intertemporal variation in religious friendship-making among non-Muslims. Some of the analyses suggested a minor increase in non-Muslims' reluctance towards friendships with Muslim girls, but this change was both substantively small and not consistently statistically significant. Throughout the analyses, there was no variation

in non-Muslims' reluctance to make friends with Muslim boys. Overall, the results thus suggested stability rather than change in non-Muslim reluctance in adolescence.

Yet, this does not mean that non-Muslim reluctance to friendships with Muslim youth is absent. Instead, the analyses showed that, throughout adolescence, non-Muslims were reluctant to make friends with both Muslim boys and Muslim girls. Other than in the previous chapter, there also was no evidence that non-Muslims were more reluctant towards Muslim boys than Muslim girls. Instead, reluctance towards friendships with Muslim boys and girls was similar, with some indication of non-Muslim boys being more open towards befriending Muslim boys than girls.

In sum, these findings suggest that only Muslim girls experience substantial dynamics in religious friendship-making in adolescence, with their in-group bias consistently increasing throughout adolescence. Stability in Muslim boys' and non-Muslim youths' friendship-making conforms to previous findings of stable intergroup attitudes in adolescence (Crocetti et al. 2021; Raabe & Beelmann 2011). At the same time, the substantial dynamics observed among Muslim girls do not contradict these previous findings: Rather than from changing intergroup attitudes, I hypothesized variation in Muslim girls' religious friendship-making to originate from the changing impact of endogamy norms, a mechanism the next chapter will provide more direct evidence on.

3.5.1 Understanding Inconsistencies in Non-Muslims' Reluctance towards Muslim Boys and Girls

As mentioned above, the major inconsistency between this and the previous chapter's findings is the observation of non-Muslim reluctance towards Muslim girls in this chapter, which was not evident in the previous one. While I cannot conclusively resolve this inconsistency, I suggest two potential starting points that refer to differences between the data used in the two chapters.

One important difference between the CILS4EU data used in Chapter 2 and the FIS data employed here is that the CILS4EU, but not the FIS data, contains a substantial proportion of upper secondary schools. In these upper secondary schools, Muslim girls may be perceived very differently than in lower-ranking school types, resulting in differences in how open non-Muslims are to friendships with them. In particular, common stereotypes about Muslim girls claim that they are uneducated, docile, and oppressed (Abo-Zena 2019; Basit 1997a; Sirin & Katsiaficas 2011). Given the very nature of these stereotypes, non-Muslims may consider them less applicable to Muslim girls who participate in upper secondary education. In addition, a comparison of Muslim

girls in upper secondary and other schools (based on the CILS4EU data and documented in Appendix B.4) suggests that Muslim girls more strongly differ in their religiosity, gender role attitudes, and values of sexual tolerance across different school types compared to Muslim boys. In terms of their values—and actual or expected lifestyles—Muslim girls in upper secondary schools may therefore be more similar to their non-Muslim peers than in lower secondary schools. Both differences in stereotypes towards Muslim girls and their actual characteristics may thus be responsible for a greater openness of non-Muslims to Muslim girls in upper secondary schools. Therefore, a stronger reluctance to Muslim girls in the FIS data may be a consequence of the absence of upper secondary schools in the data.[13]

An alternative explanation may be the higher religious diversity of the networks in the FIS data. In other work, I have established that non-Muslims' reluctance to make Muslim friends is stronger in more diverse networks (Leszczensky & Kretschmer 2022). While the corresponding analyses do not differentiate between friendships with boys and girls, it is conceivable that reluctance only spreads to Muslim girls when diversity is high. At high diversity, group identities and boundaries tend to become more salient (Leszczensky et al. 2020a; Leszczensky & Kretschmer 2022; Moody 2001), so the weaker and less clearly "anti-social" (Fourgassie et al. 2023) stereotypes that Muslim girls face compared to boys may only have consequences for friendship-making at high levels of diversity.

However, both this inconsistency in findings and the limited insights into the exact mechanisms behind gendered reluctance towards Muslim youth in general call for additional research. In particular, this concerns a better understanding of the specific *stereotypes* that Muslim boys and girls face. While there is accumulating evidence on the gendered stereotypes that non-Muslims hold about Muslim adults (Erentzen et al. 2022; Fourgassie et al. 2023), our knowledge on gendered stereotypes towards young Muslims and their consequences for friendship-making is more limited.

3.5.2 Muslim Girls' Increasing In-Group Bias: Implications for Intergroup Attitudes and Integration into Western Societies

More so than for other youth, this chapter highlighted strong dynamics of interreligious friendship-making for Muslim girls in adolescence. The increasing

[13] In principle, this explanation could be tested by analyzing religious friendship-making separately by school type. In practice, differentiating the analyses from Chapter 2 by school type is not possible given the complexity of the corresponding SAOMs.

in-group bias observed among Muslim girls can have various consequences for their integration into Western societies.

First, the strong in-group bias that Muslim girls develop in late adolescence may have long-term consequences for intergroup attitudes. If, as suggested, in-group bias is driven by endogamy norms, it is likely to reflect normative regulations rather than negative attitudes towards non-Muslims. Still, given the close link between intergroup friendships and intergroup attitudes established by past research (Davies et al. 2011), the lack of interreligious contact that in-group bias comes with entails the risk of long-term deterioration in out-group attitudes. This also holds true for non-Muslims, whose stereotypes towards Muslim girls may persist or even intensify as a reaction to Muslim girls' in-group bias. In adolescence, the observed patterns of non-Muslim reluctance towards Muslim girls suggest that, if anything, this process is slow. However, Muslim girls' in-group bias is strongest in late adolescence, so its consequences for non-Muslims' stereotypes and prejudice may only become visible in early adulthood, which I did not capture in this study.

Second, an increasing in-group bias can also hamper Muslim girls' structural integration. In late adolescence, youth make important decisions on their educational and occupational trajectories. Social capital affects these decisions, and since most Muslim youth are descendants of immigrants, their families frequently lack knowledge of the educational system and labor market institutions (Kretschmer 2019; Kristen 2008). Contact to native-origin peers, whose families are better acquainted with these institutions, can thus be beneficial to make adequate plans. Lacking out-group friendships in late adolescence, Muslim girls may only have limited access to such information, which can negatively affect their long-term structural integration.

Finally, a lack of out-group friendships may be particularly detrimental to Muslim youth whose families recently migrated or fled to Europe and who are not yet fluent in the host country language. While most Muslin youth in the data I analyzed were born and raised in Germany, migration from Muslim-majority countries is an ongoing trend (UN Refugee Agency 2015), and language acquisition a major challenge for immigrant and refugee children. Regular communication with native speakers is a key determinant of learning a new language in general (Moyer 2008) and even more so after the onset of adolescence, when obtaining language proficiency becomes harder (Dollmann et al. 2020). Therefore, a strong in-group bias among recently migrated adolescent Muslim girls could limit their acquisition of language skills, which may in turn hamper their integration into Western societies more generally.

3.5.3 Conclusion

In this chapter, I investigated the dynamics of interreligious friendship-making between Muslim and non-Muslim youth throughout adolescence. Muslim boys' in-group bias as well as non-Muslims' reluctance proved largely stable in adolescence. By contrast, Muslim girls' interreligious friendship-making changed substantially, with Muslim girls' in-group bias rising consistently and steeply as they aged. By mid-adolescence, both the previous and this chapter thus demonstrated a stronger focus of Muslim girls than boys on in-group friendship-making. This *gender gap* in interreligious friendships is in line with the expectation that gendered endogamy norms increasingly constrain Muslim girls' interreligious friendship-making in adolescence. Still, despite converging patterns, neither this nor the previous chapter have provided any *direct* evidence on the operation of endogamy norms. Establishing direct evidence on the contribution of gendered endogamy norms to the gender gap in Muslim youths' interreligious friendship-making is the goal of the next chapter.

Chapter 4

Endogamy Norms and the Gender Gap in Muslim Youths' Interreligious Friendships: Evidence from Two Studies

An extended version of Study 1 in this chapter, co-authored with Kathrin Lämmermann and Lars Leszczensky, is under review at an international peer-reviewed journal. For reasons of consistency, I have rewritten Study 1 from a first-person perspective and have made both linguistic and substantive changes. An extended version of Study 2 is in preparation for submission to an international peer-reviewed journal.

Abstract

The first two substantive chapters of this book have both found that, by mid-adolescence, Muslim girls have a stronger in-group bias than Muslim boys. All patterns and trends were also consistent with the idea that this gender gap in in-group friendship-making is a consequence of the constraints gendered endogamy norms may not only impose on Muslim girls' interreligious romance, but also on their intergroup friendships. However, direct evidence of the contribution of endogamy norms to gendered friendship-making has been missing so far. Relying on two empirical studies, this chapter provides such evidence.

In a first study, I investigate whether gender-specific developments and gender-specific effects of religiosity, parental control, and leisure time activities can explain the emerging gender gap in in-group bias. Endogamy norms can shape friendship-making through all of these factors, so their contribution to the gender gap hints at an influence of endogamy norms. Estimating random-effects growth curve models on the six-wave survey network data used in the previous chapter, I find that religiosity, parental control, and leisure time activities explain one third of the gender gap in in-group bias emerging in adolescence. While this provides preliminary evidence of the contribution of endogamy norms to the gender gap, this evidence is necessarily tentative in the absence of direct norm measures.

I therefore investigate the contribution of gendered endogamy norms to gendered intergroup friendship-making with a second, cross-sectional study that provides direct measures of endogamy norms. Using linear probability models and mediation analysis on a sample of 18-19-year-old Muslim youth, I can attribute half of the gender gap in in-group friendship-making to the stronger endogamy norms Muslim girls hold compared to boys. The influence of endogamy norms also persists when accounting for potential alternative explanations of the gender gap. There is evidence that not only youths' but also parental norms constrain interreligious friendship-making, though differentiating between their respective influence is challenging because both norms are highly correlated. Independent of these challenges, endogamy norms emerge as the strongest and most consistent predictor of the gender gap in in-group friendship-making throughout all analyses.

4.1 Introduction

In Chapter 2, I have shown that by mid-adolescence, Muslim girls less frequently engage in interreligious friendship-making than Muslim boys. Chapter 3 has established that this in-group bias is not a constant of Muslim girls' lives but only develops over the adolescent years. While Muslim girls' in-group bias is still small at age 11, it rises steeply as adolescence progresses. Accordingly, a sizable gender gap in interreligious friendship-making has emerged by mid-to-late-adolescence, with Muslim girls focusing more on in-group friendships than Muslim boys.

This emerging gender gap is consistent with the idea that, as they proceed through adolescence, Muslim girls increasingly experience complications regarding their friendships with non-Muslim youth. Throughout this book, I have suggested that *gendered endogamy norms* may be responsible for these complications. Gendered endogamy norms, which more strongly oppose interreligious romantic relationships for girls than boys, are well-established among Western Muslims (Buunk & Dijkstra 2017; Carol & Teney 2015; Cila & Lalonde 2014). In line with these norms, Muslim girls and women less frequently have interreligious romantic relationships than Muslim boys and men (e.g. Mood & Jonsson 2022; Qvist & Qvist 2023; Wachter & de Valk 2020; van Zantvliet et al. 2015). However, the gender gap in interreligious friendship-making documented in Chapter 2 and 3 suggests the possibility that these norms not only affect romantic relationships but also have spillover effects on Muslim girls' intergroup friendships.

While previous chapters have documented patterns and trends in line with gendered endogamy norms, they have not provided direct evidence of their influence. In this chapter, I discuss two empirical studies aimed at providing such evidence.

Study 1 is a continuation of the dynamic analysis of friendship-making provided in Chapter 3. While Chapter 3 *documented* an emerging gender gap in Muslim adolescents' interreligious friendship-making, this chapter's follow-up study aims to *explain* this gap by investigating the developmental processes triggered by and the factors related to gendered endogamy norms. To identify these processes, I build on the literature on Muslim youths' romantic relationships, which points to several factors that interfere with Muslim girls' intergroup dating and are closely connected to endogamy norms. I concentrate on three key factors, all of which may constrain not only interreligious romance but also intergroup friendships: individual religiosity, parental control, and limited participation in activities that provide out-group contact (Buunk & Dijkstra 2017; Carol & Teney 2015; Hennink et al. 1999).

In Study 1, I assess whether these factors are associated with Muslim girls' increasing in-group bias and can explain the gender gap in interreligious friendship-making emerging in adolescence. I consider that, due to gendered endogamy norms, factors such as individual religiosity, parental control, and participation in activities with out-group contact may not only *develop* differently among adolescent Muslim boys and girls but also have *gender-specific effects*. I study these developmental processes with random-effects growth curve models applied to the six-wave longitudinal survey network data also employed in the previous chapter.

The approach of Study 1 is appealing because it immediately builds on the developmental component of gendered endogamy norms, which become increasingly salient after the onset of adolescence (Abo-Zena 2019; Scourfield et al. 2013). At the same time, conclusions on the impact of gendered endogamy norms from Study 1 are necessarily preliminary, as it does not directly measure these norms, but instead focuses on factors that past research indicates are linked to them. On the one hand, the analyses are therefore bound to miss some of the pathways through which endogamy norms affect friendship-making. On the other hand, the contribution of the factors considered does not necessarily only reflect the impact of gendered endogamy norms but can also refer to other changes in adolescence.

To address these limitations, Study 2 relies on data that contain both a direct measure of endogamy norms and information on a wide variety of other mechanisms that may be responsible for the gender gap in interreligious friendship-making. On the one hand, this information allows me to directly estimate how much of the gender gap is attributable to gendered endogamy norms. On the other hand, it allows me to distinguish the contribution of endogamy norms from that of various alternative explanations, including gendered experiences of discrimination, opportunities for out-group interaction, religiosity more broadly, and norms on romance and sexuality beyond endogamy norms. Finally, I use the data to zoom in on endogamy norms, differentiating between norms on *religious* and *ethnic* endogamy as well as the endogamy norms of Muslim *youth themselves* and those they perceive *their parents* to hold. Accordingly, Study 2 provides a comprehensive assessment of the forces behind the gender gap in interreligious friendship-making, allowing me to identify the contribution of endogamy norms in greater detail.

To conduct these analyses, Study 2 relies on cross-sectional data from the fourth wave of the CILS4EU project (Kalter et al. 2021), which surveyed 18-19-years-old Muslim adolescents in Germany. While this data, enriched with information from earlier waves, provides comprehensive information on endogamy norms and other factors potentially behind the gender gap, it also

necessitates the use of less refined measures of friendship-making compared to Study 1.

Studies 1 and 2 each have distinct strengths and limitations. At the same time, they approach the assessment of the role of gender endogamy norms in friendship-making differently, drawing from separate data sets and utilizing different analytical strategies. Therefore, I hope that *converging* evidence in the face of these differences makes a more convincing case for the influence of gendered endogamy norms on Muslim youths' interreligious friendship-making than evidence from each study individually.

4.2 Study 1: A Developmental Perspective on Key Factors Behind Gendered Endogamy Norms

4.2.1 Background

Key Factors Behind Endogamy Norms: Religiosity, Parental Control, and Leisure Time Activities

In Chapter 3, I have suggested that gendered endogamy norms become increasingly salient as adolescence progresses and (interreligious) romantic relationships become a realistic threat (Collins et al. 2009; Hennink et al. 1999; Scourfield et al. 2013). As these norms start to regulate Muslim girls' behavior, they can have consequences not only for romantic relationships but friendship-making. The previous chapter's finding that the gender gap in interreligious friendship-making only *emerges* over the course of adolescence is in line with this idea of increasing regulation by endogamy norms.

However, Chapter 3 has not resolved which actual changes in youths' attitudes, behaviors, and outside constraints are responsible for changes in adolescent friendship-making. In other words, the specific developmental processes through which endogamy norms increasingly interfere with Muslim girls' interreligious friendship-making in adolescence have not yet been identified. In this study, I build on the literature on intergroup romantic relationships to investigate these processes. This research has already collected insights on the different factors that constrain Muslim girls' interreligious romantic relationships. According to this literature, three key factors stand out: *individual religiosity, parental control,* and *activities* that provide limited opportunities for out-group contact (Carol 2016b; Hennink et al. 1999; van Zantvliet et al. 2015). From past research, we already know that these factors are both connected to Western Muslims' endogamy norms (Buunk & Dijkstra 2017; Carol & Teney

2015; Cila & Lalonde 2014), and that they impede Muslim girls' intergroup romantic relationships (Hennink et al. 1999; Wachter & de Valk 2020; van Zantvliet et al. 2015). Next, I first briefly discuss why these factors may also limit Muslim youths'—and, in particular, Muslim girls'—interreligious friendship-making. After that, I introduce the different developmental pathways through which they may contribute to the emerging gender gap in in-group friendship-making.

Individual Religiosity Endogamy norms are particularly strong among more *religious* Muslim youth, who are likely both to have internalized these norms and to be motivated to comply with them (Buunk & Dijkstra 2017; Carol & Teney 2015; Cila & Lalonde 2014). Given the gendering of endogamy norms, it is particularly likely that Muslim girls with high levels of religiosity consider close interaction with non-Muslim boys incompatible with their stance on interreligious and cross-gender relations (Giuliani et al. 2017; McGrath & McGarry 2014). They are also more likely to shun interaction with non-Muslim girls, who may bring them into contact with non-Muslim boys or lower their standards on cross-gender interaction (Hawkey et al. 2018; Hennink et al. 1999; Zine 2008). Accordingly, endogamy norms are more likely to translate into limited interreligious friendship-making among more religious Muslim youth and among Muslim girls in particular.

Parental Control Endogamy norms do not only shape Muslim youths' own intergroup behavior but also the constraints they face to social interaction. Irrespective of Muslim youths' own convictions, parents with strong endogamy norms are likely to enforce these norms by *controlling* their children's social behavior (Carol & Teney 2015; Hennink et al. 1999). In line with the gendering of religious norms, this control tends to be stronger for Muslim girls. Accordingly, some Muslim parents disapprove of their daughters' out-group interaction and limit or even explicitly prohibit it (Hennink et al. 1999; McGrath & McGarry 2014; Scourfield et al. 2013). Some Muslim parents only restrict Muslim girls' interaction with non-Muslim boys, but others also oppose relations with non-Muslim girls due to their potential corrupting influence (Hawkey et al. 2018; Hennink et al. 1999).

Leisure Time Activities Religious norms can also have implications for Muslim youths' interreligious friendships by shaping their *leisure time activities*. Leisure time activities that provide regular exposure to out-group members facilitate intergroup friendship-making (McPherson et al. 2001; Smith et al. 2014). However, to comply with religious norms about modest public behavior, Muslim youth—and girls in particular—may limit their participation in sports clubs

or youth centers that provide such exposure (Hennink et al. 1999; de Knop et al. 1996; Stodolska & Livengood 2006). For similar reasons, Muslim girls may avoid going out with friends or attending parties and instead more frequently participate in activities with their family and religious community (Giuliani et al. 2017; McGrath & McGarry 2014). This most directly prevents out-group friendships within the context of leisure time activities but can also affect friendships in other contexts. For example, adolescents frequently meet and get to know their schoolmates better during leisure time activities, so non-participation in these activities may also hamper interreligious friendship-making in school.

Two Developmental Pathways through Which Religiosity, Parental Control, and Leisure Time Activities Can Operate

Given their link to both endogamy norms and friendships, how can religiosity, parental control, and leisure time activities induce the gender gap in in-group bias emerging in adolescence? The discussion above has already foreshadowed that due to the gendering of endogamy norms, the influence of these factors on interreligious friendship-making can be gender-specific. However, given the developmental perspective I take in this study, it is important to consider that gendered influence can operate through various developmental processes. Specifically, I distinguish two key developmental pathways: the *gender-specific trajectories* of religiosity, parental control, and leisure time activities on the one hand, and their *gender-specific effects* on the other.[1]

Gender-Specific Trajectories In parallel with the increasing salience of endogamy norms in adolescence, religiosity, parental control, and leisure time activities may start to develop differently among Muslim boys and girls. Gender-specific trajectories like these, in turn, can result in gendered interreligious friendship-making.

Since gendered endogamy norms primarily target girls, adolescence is a time in which parents and religious communities may seek to strengthen Muslim girls' *religiosity* to ensure their norm adherence (Abo-Zena 2019; Scourfield et al. 2013). Muslim girls themselves may also become more aware of the importance of religion in their life as puberty marks their transition to fully accountable members of the religious community (Abo-Zena 2019; Giuliani et al. 2017).

[1] A third possible developmental pathway is the *age*-specific effects of religiosity, parental control, and leisure time activities. Unfortunately, the sample of Muslim youth in this study is too small to estimate age-specific effects with sufficient statistical power. In a corresponding analysis, I did not find evidence of age-specific effects, but given insufficient power, this finding is not conclusive.

In adolescence, Muslim girls' religiosity may therefore rise relative to that of Muslim boys and increasingly limit their interreligious friendship-making.

As they grow older and gendered endogamy norms become more salient, Muslim girls may also start to face stricter *parental control* than their brothers. Indeed, studies have shown that parental restrictions intensify in adolescence and parents limit the social interactions of their daughters more so than their sons' (Basit 1997a; Hennink et al. 1999; Scourfield et al. 2013).

Finally, both Muslim girls themselves and their parents may consider *leisure time activities* with regular out-group contact increasingly inappropriate in adolescence (Hennink et al. 1999; Scourfield et al. 2013). As adolescence progresses, Muslim girls, in comparison to Muslim boys, may thus participate less in sports, extracurricular school activities, parties, and other events that facilitate mingling across religious boundaries (Basit 1997a; Hennink et al. 1999). Like growing religiosity and parental control, this decreasing participation in activities with out-group exposure may limit their interreligious friendship-making.

Gender-Specific Effects However, gender-specific trajectories are not the only pathway through which religiosity, parental control, and leisure time activities can contribute to the emerging gender gap in interreligious friendship-making. Even if these factors develop similarly among Muslim boys and girls, they can still have *gender-specific effects* on friendship-making, so that a similar development has different consequences for boys and girls.

Consider *religiosity* as an example. As endogamy norms primarily target adolescent Muslim girls, the norm internalization that comes with high *religiosity* is likely to affect their social relationships more than it would for Muslim boys. This reasoning is supported by research on intergroup romantic relationships, which finds that high religiosity reduces Muslim girls'—but not Muslim boys'—openness to out-group dating (Buunk & Dijkstra 2017; Carol & Teney 2015). Accordingly, high levels of religiosity may also impinge on the friendships of Muslim girls more strongly compared to Muslim boys.

Similarly, though Muslim parents may *control* both their adolescent sons' and daughters' behavior, the extent of interreligious contact that they tolerate may be lower for girls (Basit 1997a; Hennink et al. 1999). Accordingly, a similar development of parental control may still come with a stronger inhibition of girls' than boys' interreligious friendships. Again, research on romantic relationships supports this argument, showing that parental control is associated with a lower openness to interreligious dating among Muslim girls, but not among Muslim boys (Carol & Teney 2015).

Finally, due to different interaction patterns of Muslim boys and girls, girls are more likely than boys to depend on *leisure time activities* with out-group

exposure to befriend out-group members. Like other adolescent boys, Muslim boys often engage in unstructured activities in larger groups, such as playing soccer on the local sports court (Maccoby 1998; McDougall & Hymel 2007). These large groups are likely to encompass at least some out-group members, thus providing Muslim boys with opportunities to befriend non-Muslims. By contrast, girls tend to engage in one-on-one interactions or in smaller and more pre-selected groups (McDougall & Hymel 2007; Rose & Rudolph 2006) that provide less exposure to out-group members. This general interaction pattern is further amplified among Muslim girls, who are strongly involved with their family and religious community (Basit 1997a; Hennink et al. 1999; McGrath & McGarry 2014). As girls do not have regular access to out-group peers in the unstructured larger group activities that boys engage in, spending leisure time in clubs, youth centers, or other contexts that provide opportunities for out-group interaction should be more decisive for the out-group friendships of Muslim girls than Muslim boys.

4.2.2 Data and Methods

Data

Like the previous chapter, this study uses longitudinal data from the Friendship and Identity in School (FIS) project (Leszczensky et al. 2022). The data cover six waves and include information on 2,701 students nested within 29 grades from ten ethnically diverse secondary schools in the German federal state of North Rhine-Westphalia. All schools were either lower secondary, intermediate secondary, or comprehensive schools. In each school, the study surveyed all students who attended the fifth, sixth, and seventh grade (i.e., academic year) during the first wave. Subsequent waves were about nine months apart. In the first wave, fifth-graders were 11–12 years old, sixth-graders 12-13 years old, and seventh-graders 13-14 years old. By the sixth wave, students who initially attended the seventh grade were 17-18 years old.

As this study is concerned with the development of *Muslim* youths' inter-religious friendship-making, I limit the sample to students who self-identified as Muslim. I confine observations to the age range between 11 and 17 years, as there are too few observations for younger and older ages to obtain reliable estimates. This results in a sample of 760 Muslim students and 2,562 observations over time (person-waves). After listwise deletion of missing values, the final analytical sample consists of 737 Muslim students and 2,239 observations over time.

Variables

In-group bias in adolescents' friendships. Like in Chapter 3, I rely on students' nominations of up to ten of their best friends from their school grade to capture friendship-making with the religious in- and out-group. In this study, I measure Muslim youths' in-group bias with their *excess segregation*. Excess segregation measures Muslim youths' religious friendship segregation beyond what is expected from the opportunity structure. It is captured by the difference between the share of Muslims among a student's friends and the share of Muslim students at the grade level. If friendship-making was independent of religion, the average share of Muslim friends should equal the average share of Muslim students in the grade. A positive value therefore indicates a Muslim in-group bias.

Age and gender. Students self-reported their year and month of birth, which I use to calculate their (monthly) *age* at the time of each wave. *Gender* is measured by students' self-reports of whether they are male or female. 52.6% of the Muslim students were female, while 47.4% were male.

Religiosity. I measure religiosity by students' self-reported frequency of prayer, which they could indicate on a six-point scale ranging from "never" (0) to "five times a day or more" (5).

Parental control. I assess parental control with four items: (1) "My parents tell me that it is important what friends I have", (2) "My parents tell me that I should not relate with certain people", (3) "My parents tell me when they don't like my friends", and (4) "My parents encourage me to do something with friends they like". All items were rated on five-point scales ranging from "does not apply at all" (0) to "applies completely" (4). I use the mean of these four items as a measure of parental control. This scale is highly reliable (Cronbach's alpha = 0.77), and higher values indicate stronger parental control.

Leisure time activities. I consider three leisure time activities that can provide opportunities for out-group contact: (1) "going to the youth center", (2) "spending time in a club (sports, music, theater, or some other club)", and (3) "partying". Students could indicate how often they engage in these activities on a six-point scale ranging from "never" (0) to "daily" (5).

Table 4.1 gives a descriptive overview of all variables included in the analyses.

Methods

I use *random-effects group-specific* growth curve models (GCMs; Brüderl et al. 2019; Halaby 2003) to investigate the emerging gender gap in Muslim youths' in-group

Table 4.1: Overview of Variables (Study 1)

Variable	Mean	SD	Minimum	Maximum
In-group bias	0.22	0.28	−0.56	0.89
Age	14.15	1.41	11	17
Gender: Girl (%)	52.61			
Religiosity	2.84	1.69	0	5
Parental control	2.93	0.92	0	4
Leisure time activities				
Spending time in a club	2.16	2.02	0	5
Going to youth center	0.75	1.31	0	5
Partying	0.87	1.28	0	5

bias in adolescence.[2] The dependent variable in the GCMs is Muslim youths' in-group bias and the time variable is their (monthly) age. Like in Chapter 3, I model *group-specific* growth curves by interacting age with students' gender. However, I estimate random-effects GCMs rather than the fixed-effects GCMs from Chapter 3 because this study is interested in documenting and explaining the *gender gap* in in-group bias emerging between Muslim boys and girls. Fixed-effects GCMs, however, only identify change in in-group bias and not its extent, so the actual size of the (emerging) gender gap cannot be inferred from fixed-effects GCMs. To still ensure that age trends and covariate effects estimated in the random-effects GCMs are not confounded with differences between grade networks, all analyses control for time-stable differences between grades with grade dummies.[3] Furthermore, I verified that estimates for associations between in-group bias and the other variables considered are similar in fixed-effects GCMs. To facilitate the estimation and interpretation of the gender gap as well as the contribution of the covariates considered to it, I only model linear age effects. This assumption of linearity is supported in a robustness check documented in Appendix C.1.[4]

[2]Other than in Chapter 3, I do not rely on stochastic actor-oriented models (SAOMs) for network evolution. The models I estimate are too complex for an implementation in SAOMs with the comparably small sample of Muslim youth. Furthermore, SAOM estimates are multinomial logit coefficients. Due to issues of scaling, comparisons of coefficients across models are therefore not possible (Duxbury 2023), and so far, transformations of coefficients that solve this problem have not been implemented. As this study is primarily interested in how the gender gap in in-group bias changes when accounting for factors related to gendered endogamy norms, SAOMs are not suited for the analysis.

[3]All substantive results are identical when including further controls (socio-economic status, ethnic background, and migrant generation). However, because missing values on these variables reduce the sample size, I do not include them in the main analyses.

[4]Remember that in Chapter 3, there were only nonlinearities in Muslim girls' friendships with boys, which constitute only a small proportion of all Muslim girls' friendships.

4.2.3 Results

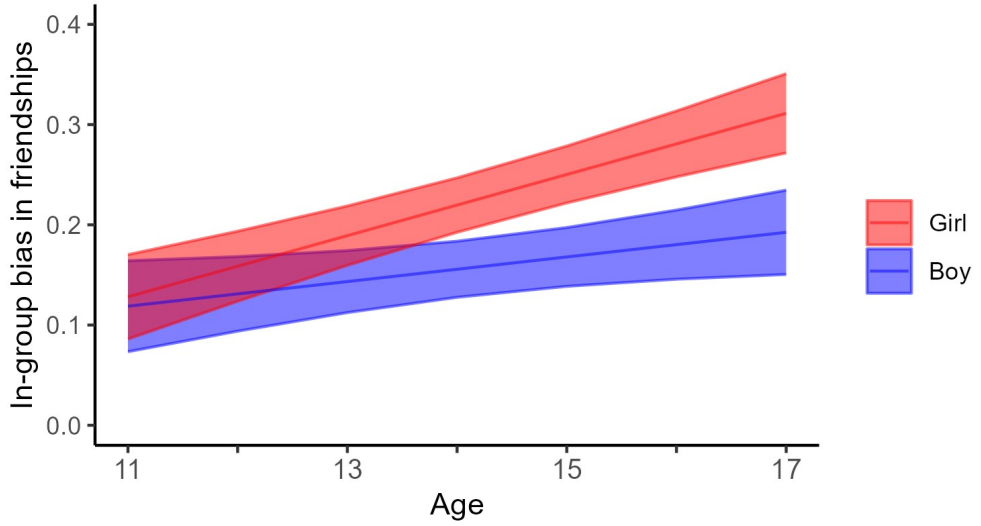
The Emerging Gender Gap in Interreligious Friendship-Making in Adolescence

In a first step of the analysis, I use random-effects GCMs to establish the emerging gender gap in interreligious friendship-making. To investigate this, I estimate a baseline GCM (M0) that examines the development of in-group bias among Muslim boys and girls (see Table C.2 in Appendix C.2 for full model results). Figure 4.1 presents the predicted values of Muslim boys' and girls' in-group bias from ages 11 to 17 from this GCM. In line with findings from Chapter 3, Figure 4.1 demonstrates that a gender gap in-group bias emerges in adolescence. At age 11, Muslim boys and girls have a similar in-group bias of about 13 percentage points. From ages 11 to 17, however, the in-group bias of Muslim girls increases steeply by 18.3 percentage points ($p < .001$; an increase of 140% relative to age 11). This increase is twice as large as the increase in the in-group bias of Muslim boys, which only rises by 7.4 percentage points ($p < .05$; increase of 60% relative to age 11). As a result, a gender gap of 10.9 percentage points ($p < .05$) emerges between Muslim girls and boys from age 11 to 17, which almost equals the in-group bias observed at age 11 in size.[5]

This emerging gender gap of 10.9 percentage points is the starting point of all subsequent analyses in this study. In these analyses, I examine whether the emerging gender gap can be explained by the gender-specific trajectories and the gender-specific effects of religiosity, parental control, and leisure time activities. I first investigate each factor separately to assess its individual contribution to the gender gap and determine the pathways through which it operates. Afterwards, I present a combined model including all factors that significantly contribute to the emerging gender gap, aiming to assess how much of the gap they explain jointly.

[5]While both the random-effects GCM results from Figure 4.1 and the SAOM analysis from Chapter 3 suggest an emerging gender gap in in-group bias, some of their other predictions diverge. First, Figure 4.1 suggests a similar in-group bias among Muslim boys and girls at age 11, while the SAOMs from Chapter 3 suggested a lower in-group bias among Muslim girls than boys at that age. Second, the SAOMs suggested no change in in-group bias among Muslim boys in adolescence, while the random-effects GCMs detect a minor increase. In parts, these differences are within the margins of random variation, as the SAOM results from Chapter 3 are estimated with limited precision. In addition, it is important to be aware that the SAOM predictions accounted for a variety of other network processes that can amplify in-group bias. Even with a full understanding of the deviations between the SAOM and GCM analyses pending, I rely on the GCM analysis throughout this study, as both analyses agree on the emerging gender gap, which is the focus of this study.

Figure 4.1: Predicted In-Group Bias by Age for Muslim Girls and Boys from Random-Effects GCM



Note: 95% confidence intervals. Controlled for school-grade fixed-effects.

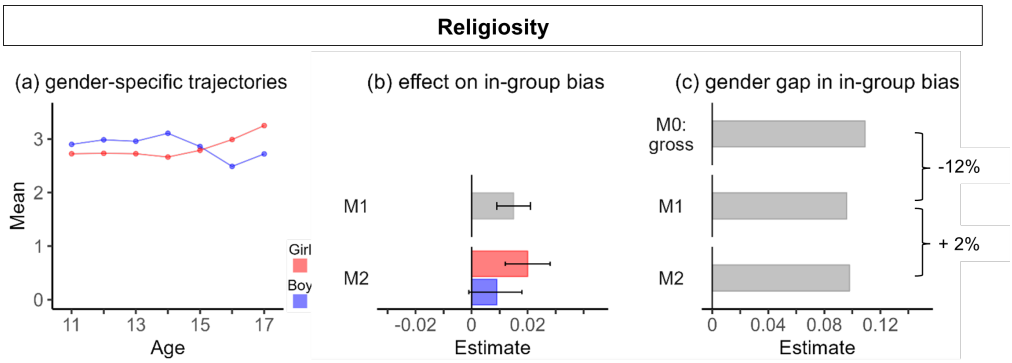
Gender-Specific Trajectories And Gender-Specific Effects of Religiosity, Parental Control, and Leisure Time Activities

To investigate each factor's contribution to the gross gender gap identified in the baseline GCM (M0), I estimate two additional GCMs for each factor. First, M1, a GCM that considers the factor's contribution to the gender gap through *gender-specific trajectories*, estimating an overall effect of the factor for both genders. Second, M2, a second GCM that shows whether the factor contributes to the gender gap through *gender-specific effects* by estimating separate effects of the factor for boys and girls. Results from these factor-specific analyses are displayed in Figure 4.2-4.4 (see Appendix C.2, Table C.3 for full results).

Religiosity Figure 4.2 illustrates how religiosity contributes to the gender gap in Muslim youths' in-group bias. To assess the gender-specific trajectory of religiosity, panel a depicts the mean religiosity of Muslim boys and Muslim girls over the adolescent years, showing that Muslim girls' religiosity rises in adolescence, while Muslim boys' religiosity declines.

Panel b shows estimates for the effect of religiosity on in-group bias from two GCMs, one from the model estimating an overall effect for Muslim boys and girls (M1) and one from the model estimating gender-specific effects (M2). According to M1 in panel b, higher religiosity is associated with a stronger in-group bias among Muslim youth ($p < .001$). Further taking gender-specific

Figure 4.2: Religiosity: Gender-Specific Trajectories, Effect on In-Group Bias, and Gender Gap in In-Group Bias



Note: Panel a: age rounded to the nearest year; panel b: 90% confidence intervals. Controlled for school-grade fixed-effects. M0: Baseline, M1: Gender-specific trajectories, M2: Gender-specific effects.

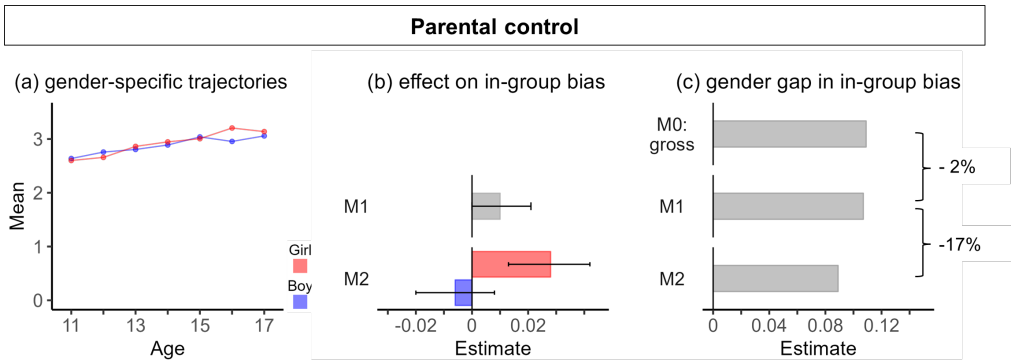
effects into account, point estimates from M2 suggest that this effect tends to be stronger among Muslim girls than Muslim boys, but this difference itself is not statistically significant ($p > .1$).

Panel c compares the gross gender gap from the baseline model without religiosity (M0) with the estimated gender gap in M1 and M2. The percentage change is depicted on the right, whereby the upper percentage value indicates the decrease in the gender gap compared to M0 when gender-specific trajectories of religiosity are accounted for. The combination of the increase in religiosity among Muslim girls relative to Muslim boys (panel a) and the effect of religiosity on in-group bias in M1 (panel b) results in a statistically significant reduction of the gender gap by 12% ($p < .05$).[6] By contrast, the lower percentage value (+ 2%) indicates that the gender gap in M1 hardly changes when accounting for gender-specific effects of religiosity on friendship-making in M2. Religiosity thus contributes to the emerging gender gap in Muslim in-group bias through its gender-specific trajectory rather than its gender-specific effects.

Parental Control Figure 4.3 investigates whether parental control contributes to the gender gap in in-group bias. Panel a in Figure 4.3 shows that, unlike for religiosity, the trajectory of parental control is almost identical for Muslim boys and girls, with a steady, yet moderate increase in adolescence. In panel b, the overall effect of parental control (M1) indicates that higher control is associated with a stronger in-group bias ($p < .1$). However, once M2 differentiates this effect by gender, higher parental control turns out to be strongly associated with

[6] I assess the significance of changes in the gender gap between the models M2, M1, and M0 with generalized estimating equation (GEE) models that allow the comparison of coefficients between nested linear models with clustered data (Yan et al. 2013). GEE estimation differs slightly from the estimation of random-effects growth curve models, but all differences are marginal and do not change any substantive conclusions.

Figure 4.3: Parental Control: Gender-Specific Trajectories, Effect on In-Group Bias, and Gender Gap in In-Group Bias



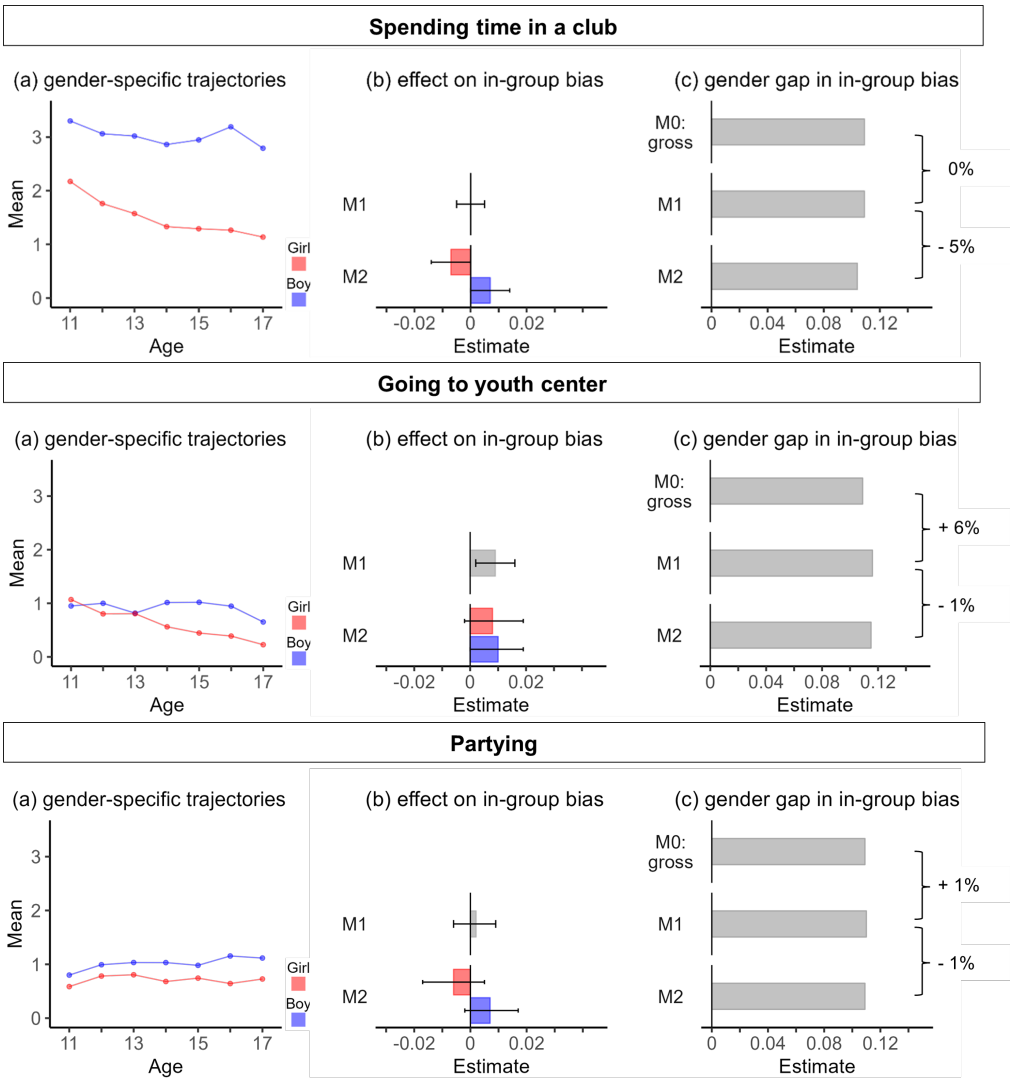
Note: Panel a: age rounded to the nearest year; panel b: 90% confidence intervals. Controlled for school-grade fixed-effects. M0: Baseline, M1: Gender-specific trajectories, M2: Gender-specific effects.

higher in-group bias among Muslim girls ($p < .01$), but not at all among boys ($p > .1$). Echoing the identical trajectories of parental control among boys and girls, the estimated gender gap in panel c is not significantly reduced when accounting for gender-specific trajectories in M1 ($p > .1$). By contrast, the gender gap falls by 17% when accounting for gender-specific effects in M2, which is a statistically significant reduction ($p < .05$). Though parental control does not develop differently for Muslim boys and girls in adolescence, it contributes to the emerging gender gap, because it only is related to a higher in-group bias among Muslim girls.

Leisure Time Activities Figure 4.4 investigates how leisure time activities contribute to the emerging gender gap among Muslim youth, distinguishing between *spending time in a club* (top row), going to a youth center (middle), and partying (bottom). Starting with spending time in a club, panel a shows that Muslim girls generally spend less time in clubs than Muslim boys, and this difference grows as adolescence progresses. Panel b indicates no overall effect of club attendance on in-group bias ($p > .1$, M1). However, the gender-specific estimates from M2 suggest diverging effects of club attendance for Muslim girls and boys, though both are at the brink of statistical significance. In-group bias tends to be lower among Muslim girls who attend clubs more frequently ($p = .103$), but higher among Muslim boys who attend clubs more frequently ($p = .113$). Though the gender-specific effects fail to reach conventional levels of statistical significance, the gender difference itself is statistically significant ($p < .05$). When accounting for gender-specific effects (M2), the gender-gap falls by 5% compared to M1; this decrease is statistically significant ($p < .1$).

By contrast, neither attending *youth centers* nor *partying* contribute to the emerging gender gap in-group bias. Though Muslim girls less frequently attend

Figure 4.4: Leisure Time Activities: Gender-Specific Trajectories, Effect on In-Group Bias, and Gender Gap in In-Group Bias



Note: Panel a: age rounded to the nearest year; panel b: 90% confidence intervals. Controlled for school-grade fixed-effects.
M0: Baseline, M1: Gender-specific trajectories, M2: Gender-specific effects.

youth centers than Muslim boys throughout adolescence, this is associated with a higher rather than a lower in-group bias among both boys and girls ($p < .05$). For *partying*, there is little temporal variation among both boys and girls. Furthermore, attending parties is not systematically connected to either Muslim boys' or girls' in-group bias, so the gender gap remains unchanged in both M1 and M2.

In sum, leisure time activities are less consistently linked to the emerging gap in in-group bias than individual religiosity and parental control. Only the attendance of clubs contributes to the gender gap, because it tends to reduce Muslim girls'—but not Muslim boys'—in-group bias.

Table 4.2: Explaining the Gender Gap: The Contribution of Gender-Specific Trajectories and Gender-Specific Effects of Religiosity, Parental Control, and Spending Time in a Club

	M0	M1	M2
	Baseline: Gross gender gap	Gender-specific trajectories	Gender-specific effects
Emerging gender gap	0.109^{*} (0.045)	0.094^{*} (0.045)	0.072 (0.045)
% change relative to M0		-14%	-34%
Factors:			
Religiosity		0.015^{***} (0.004)	
Boys			0.009 (0.006)
Girls			0.019^{***} (0.005)
Gender difference			0.011 (0.007)
Parental control		0.010 (0.006)	
Boys			-0.007 (0.009)
Girls			0.027^{**} (0.009)
Gender difference			0.034^{**} (0.012)
Spending time in a club		0.000 (0.003)	
Boys			0.007 (0.004)
Girls			$-0.007^{\dagger}$ (0.04)
Gender difference			-0.014^{*} (0.006)
N person-waves	2,239	2,239	2,239
N students	737	737	737

Note: $^{\dagger}p < .10$,$^{*}p < .05$,$^{**}p < .01$,$^{***}p < .001$. Standard errors in parentheses. All results from random-effects growth curve models with in-group bias as dependent variables and school grade fixed effects (grade dummies not shown). Emerging gender gap: difference in in-group bias emerging between girls and boys from age 11 to age 17.

Explaining the Gender Gap: A Combined Analysis of Religiosity, Parental Control, and Spending Time in Clubs

In the factor-specific analyses above, accounting for religiosity, parental control, and the attendance of clubs in leisure time each resulted in a statistically significant reduction of the gender gap. In Table 4.2, I report a combined analysis of all three factors to determine how much of the emerging gender gap they jointly explain (see Table C.2 in Appendix C.2 for full model results).

The baseline model (M0) in Table 4.2 again shows the gross gender gap in in-group bias of 10.9 percentage points emerging from ages 11 to 17 ($p < .05$). Accounting for the *gender-specific trajectories* of religiosity, parental control, and club attendance in M1, this gender gap reduces to 9.4 percentage points, which is a significant decrease of 14% ($p < .01$). When additionally accounting for *gender-specific effects* in M2, the gender gap falls to 7.2 percentage points and is no longer statistically significant ($p > .1$). Relative to M1, this is a significant decrease of 23% ($p < .05$), and relative to M0, a total decrease of 34% ($p < .001$). Jointly, religiosity, parental control, and leisure time activities thus account for

one third of the gender gap in in-group bias emerging between Muslim boys and girls from ages 11 to 17.[7]

4.2.4 Summary

In this study, I provided an analysis of developmental processes through which gendered endogamy norms can contribute to the gap in interreligious friendship-making emerging between adolescent Muslim boys and girls. I focused on the gender-specific development as well as gender-specific effects of religiosity, parental control, and leisure time activities, which are all factors previous research has shown to be connected to gendered endogamy norms and Muslim girls' limited interreligious romantic relationships (Carol & Teney 2015; Hennink et al. 1999; Talbani & Hasanali 2000; Van Pottelberge et al. 2019). However, their contribution to the diverging interreligious friendship-making among adolescent Muslim boys and girls had not been assessed prior to this study.

To fill this gap, I analyzed six waves of longitudinal data on German Muslim youth aged 11-17 with random-effects growth curve models. I found that both religiosity and parental control contribute to the gender gap in interreligious friendship-making, while leisure time activities proved less relevant. Religiosity diverged between Muslim boys and girls in adolescence, with girls becoming more and boys less religious. By contrast, parental control increased for both genders, but was only associated with lower interreligious friendship-making among Muslim girls. Jointly, religiosity, parental control, and leisure time activities explained one third of the emerging gap in in-group bias between Muslim boys and girls. As I have argued, the gender-specific development as well as the gender-specific effects of religiosity, parental control, and leisure time activities are likely to at least partially reflect the operation of gendered endogamy norms. Accordingly, this study has provided initial evidence on the consequences these norms have for the gender gap in interreligious friendship-making.

However, this study has at least two key limitations, and both concern the fact that it has focused on the developmental processes related to gendered endogamy norms rather than norms themselves. First, with no direct information on endogamy norms available, this study could only assess their impact through a selected set of factors. These factors, however, are unlikely to fully capture the

[7] In a robustness check, I also assessed whether gendered experiences of discrimination and rejection contribute to the emerging gender gap in in-group bias. There was no indication that Muslim girls face stronger discrimination than Muslim boys in adolescence, and accounting for gender-specific trajectories and gender-specific effects of discrimination did not help to explain the emerging gender gap further. This is in line with the observation from previous chapters that non-Muslims are not less open to friendships with Muslim girls than with Muslim boys.

influence of endogamy norms, suggesting a potential *underestimation* of the consequences that gendered endogamy norms have for friendship-making. Second, the developmental processes related to interreligious friendship-making that I have identified in this study do not necessarily *only* represent the influence of endogamy norms. After all, gendered changes in religiosity, parental control, and leisure time activities can also reflect other developmental processes. Against this backdrop, there also is a risk that this study *overestimates* the impact of gendered endogamy norms. In Study 2, I address both of these limitations.

4.3 Study 2: The Gender Gap, Gendered Endogamy Norms and Alternative Explanations

Most clearly, the limitations of Study 1 call for a *direct* assessment of endogamy norms as well as alternative mechanisms that may be responsible for the gender gap in Muslim youths' interreligious friendship-making. Providing this direct assessment is the goal of Study 2. In Study 2, I first assess how much of the gender gap can be accounted for with an explicit measure of endogamy norms. Then, I consider various alternative explanations to investigate the robustness of endogamy norms' association with friendship-making. Finally, I differentiate between religious and ethnic endogamy norms as well as between the contribution of adolescents' own and their parents' norms. This approach addresses both key limitations of Study 1 and provides a more comprehensive assessment of the role that gendered endogamy norms play in Muslim youths' interreligious friendship-making. To provide this assessment, I use data from the fourth wave of the German part of the CILS4EU project, surveyed among 18-19-year-old Muslim youth in Germany (Kalter et al. 2021).

4.3.1 Background

The need for a direct assessment of endogamy norms

In Study 1, I have assessed the contribution of gendered endogamy norms to friendship-making by studying the gender-specific development and gender-specific effects of various factors related to these norms. This approach is useful to trace in detail how gendered endogamy norms impinge on friendship-making through specific behaviors, practices, and constraints. However, by restricting the analysis to a specific set of factors and developmental pathways, this approach is also likely to miss some of the impact that endogamy norms have on interreligious friendship-making.

This is particularly likely because the factors considered in Study 1 do not have a one-to-one correspondence with endogamy norms. Consider individual religiosity as an example. Repeatedly, past research has established that endogamy norms are stronger at higher levels of religiosity (e.g., Carol & Teney 2015; Cila & Lalonde 2014; Van Pottelberge et al. 2019). However, this link is far from perfect, and strong regulations on interreligious romance also persist among many Muslim girls with moderate religiosity (Cila & Lalonde 2014; Munniksma et al. 2012). Accordingly, measures of individual religiosity are unlikely to fully capture the impact that endogamy norms have on friendship-making. Similar concerns also apply to the other factors considered in Study 1, which all are related to endogamy norms but do not convey their impact fully. Accordingly, capturing the contribution of endogamy to the gender gap in friendship-making requires a direct measure of these norms.

Endogamy Norms and Alternative Explanations for the Gender Gap

Throughout this book, I have emphasized gendered endogamy norms as a key suspect for Muslim girls' stronger focus on in-group friendship-making. At the same time, however, I have stressed that it is important to not neglect alternative explanations for this gendered pattern. In particular, previous chapters have highlighted the necessity to account for the possibility that gendered behavior among *non-Muslims* may also be responsible for the gender gap, though I have found limited empirical evidence for this.

In this study, I go one step further and attempt to provide a more comprehensive assessment of alternative explanations by considering a wide range of characteristics and mechanisms that may contribute to the gender gap in interreligious friendship-making. This broader perspective is important for two reasons. First, to obtain a more comprehensive understanding of the gender gap in interreligious friendship-making. Second, to more firmly establish the contribution of gendered endogamy norms to the gender gap. After all, endogamy norms may be correlated with other characteristics that also affect in-group friendship-making. Failing to account for these characteristics could lead to erroneously attributing the effects of these characteristics to endogamy norms. If the influence of endogamy norms persists after accounting for alternative explanations, this therefore establishes them more convincingly as a key contributing factor to the gender gap in interreligious friendship-making.

The likelihood of erroneously attributing the effects of other factors to endogamy norms is particularly high when considering factors surrounding religiosity and religious norms more generally. After all, strong endogamy norms are frequently a manifestation of higher religiosity (Carol & Teney 2015; Cila

& Lalonde 2014; Van Pottelberge et al. 2019). In this study, I therefore study the link between in-group friendship-making and both religiosity broadly and endogamy norms more specifically. In addition, I consider religious norms that may *compete* with endogamy norms in their influence on interreligious friendship-making. This risk specifically applies to conservative sexual values and *chastity norms* that oppose premarital sexuality. Most directly, chastity norms can constrain cross-gender interaction (Altinyelken 2022; Velayati 2016), a possibility I investigate in more detail in the second part of this book. However, strong chastity norms also tend to come with restrictions to Muslim girls' social interaction more generally (Hawkey et al. 2018; Hennink et al. 1999; Talbani & Hasanali 2000) as well as a focus on activities within the family and community context (Giuliani et al. 2017; McGrath & McGarry 2014). Therefore, chastity norms may not only oppose romantic relationships and regulate cross-gender interaction, but they may also limit interreligious contact. Like endogamy norms, chastity norms tend to be stronger among Muslim girls than boys (Hendrickx et al. 2002; Yahyaoui et al. 2013). Given their gendered nature and potential link to in-group friendship-making, chastity norms may therefore also contribute to the gender gap. Next to religiosity and conservative sexual values, I also consider alternative explanations for the gender gap that are not as directly related to gendered endogamy norms. Along these lines, I investigate *experiences of discrimination* to account for the possibility that, in adolescence, Muslim boys and girls may face different treatment by non-Muslims. In the previous chapters, there was little evidence that their non-Muslim schoolmates are more reluctant to friendships with Muslim girls than boys, a pattern that may explain Muslim girls' stronger focus on in-group friendships. However, it is still possible that Muslim girls face greater discrimination in Western societies more broadly, particularly as some of them start to wear a headscarf in adolescence (Abo-Zena 2019; Haug et al. 2009). Finally, I also assess differences in Muslim boys' and girls' *opportunities* for intergroup interaction. Gendered opportunities can reflect specific contexts of interaction that Muslim girls engage in due to their religious norms (Giuliani et al. 2017; McGrath & McGarry 2014), but they can also result from other processes. For example, opportunities for in- and out-group interaction may also differ between boys and girls if they attend different schools or—as this study considers late adolescents—pursue careers in distinct professions.[8]

[8]In this study, I do not reconsider the leisure time activities discussed in more detail in Study 1. This is not merely because leisure time activities were not consistently linked to the gender gap in in-group friendship-making. In addition, Study 1 suggested that, among Muslim boys, leisure time activities (like attending a club, youth center, or partying) were associated with stronger rather than weaker in-group friendship-making, in opposition to initial expectations. This suggests that the participation in these leisure time activities may not primarily expose

Which Endogamy Norms and Whose Endogamy Norms?

There is a more convincing case for a contribution of endogamy norms to the gender gap if these norms remain clearly associated with interreligious friendship-making after accounting for the aforementioned alternative explanations. However, even if there is a case for gendered endogamy norms, two key questions remain: *Which* endogamy norms and *whose* endogamy norms shape intergroup friendship-making?

Throughout this book, I have highlighted Muslim youths' norms on *religious* endogamy, i.e., norms to have a Muslim rather than non-Muslim partner. I have focused on religious endogamy norms because they are clearly gendered, a consequence of the prohibition for Muslim women, but not Muslim men, to marry across religious boundaries according to dominant interpretations of the Qur'an (Munniksma et al. 2012; Clycq 2012). In general, however, norms on endogamy are not limited to religion but can also concern other characteristics (Kalmijn 1998). When it comes to the gender gap in interreligious friendship-making, there specifically is one further relevant type of endogamy norm: norms on ethnic endogamy (Kalmijn 1998; Schroedter & Kalter 2008). The families of most German Muslim youth originate from countries with large Muslim majorities. Accordingly, if strong ethnic endogamy norms resulted in friendship-making with peers of the same ethnic origin, this would also be reflected in friendships with Muslim peers. Thus, parts of Muslim girls' stronger focus on friendships with Muslim peers may also represent a focus on intra-*ethnic* friendship-making due to ethnic endogamy norms. If these ethnic endogamy norms are gendered as well, they may also contribute to the gender gap in interreligious friendship-making.

Having differentiated between religious and ethnic endogamy norms, a second question concerns *whose* endogamy norms are decisive. Key suspects are Muslim *youths'* own internalized endogamy norms on the one hand, and their *parents'* norms on the other (Carol 2014; Hennink et al. 1999; McGrath & McGarry 2014). In a previous study that assessed both types of norms, Carol (2014) only found an indirect effect of parental attitudes: While children's own endogamy norms were directly associated with in-group friendship-making, there was no additional influence of parental norms when accounting for children's norms. Instead, parental norms were indirectly related to their children's in-group friendship-making because parents transmitted their endogamy norms to their children (Carol 2014). This study, however, considered parental influence

Muslim boys to out-group but to in-group interaction partners, highlighting the importance of accounting for the ethnic and religious composition of the contexts leisure time activities are conducted in. This information on composition is available neither in the FIS nor the CILS4EU data. Therefore, I refrain from an analysis of leisure time activities in Study 2.

in the friendship-making of *adult* Muslim children rather than the adolescents I focus on. In line with the intergenerational transmission of religiosity among Western Muslims (de Hoon & van Tubergen 2014; Jacob & Kalter 2013), a transmission of parental norms is likely to also surface among Muslim adolescents. In adolescence, however, parental norms may well have an additional *direct* effect on friendship-making. After all, both past research and Study 1 in this chapter suggest that the social interaction of Muslim girls is, at least to some degree, constrained by parental control and supervision (Carol & Teney 2015; Hennink et al. 1999; Talbani & Hasanali 2000). More than among adult Muslims, both adolescents' and their parents' endogamy norms may therefore be relevant for interreligious friendship-making.

4.3.2 Data and Methods

Data

I use data from the fourth wave of the German part of the CILS4EU project (Kalter et al. 2019, 2021) to study the contribution of endogamy norms to Muslim youths' interreligious friendship-making. By the time of the fourth wave, respondents in the CILS4EU sample are on average 18-19 years old. I limit the sample to all youth who self-identify as Muslim, which leaves me with a sample of 629 Muslim youth from a full sample of 3,035 youth in wave 4.

I enrich the data from wave 4 with information from earlier waves (Kalter et al. 2016a,b, 2017), as various characteristics (among them, gender and religious affiliation) were not assessed in wave 4. For this process, I always added data from the wave closest to wave 4. For characteristics that are likely to vary over time, I only added data from wave 3, the predecessor surveyed one year earlier. In the discussion of the variables below, I highlight which variables originate from which wave.

Variables

In-Group Friendships. Only the first and second wave of the CILS4EU data provide detailed sociometric information on adolescents' classroom friendship networks; in the fourth wave, I have to rely on less fine-grained survey-based measures of friendship network composition. These indicators do not explicitly provide information on the *religion* of adolescents' friends but only on their *ethnic background*. However, given the strong link between ethnic and religious background, friends' religion can be inferred from their ethnic background with high probability.

More specifically, youth were asked about their friendships with peers of *Turkish, German, Italian, Polish, Russian, and other* origins. Using the CILS4EU sample to gauge how predictive ethnic background is for religious affiliation, 87% of youth with a Turkish migration background identified as Muslim, while less than one percent of German-, Italian-, Polish- and Russian-origin youth did so. Accordingly, Turkish-origin friends are highly indicative of Muslim friends, and German-, Italian-, Polish-, and Russian-origin friends are highly indicative of non-Muslim friends.[9]

For Turkish-origin friends, youth were asked "Thinking now about all of your friends. How many of them have a Turkish background?" Respondents could answer on a five-point scale with answers "none or very few", "a few", "about half", "a lot", or "all or almost all". The same question was asked for friends with a German, Italian, Polish, Russian, and other background.

In my main analysis, I capture in-group friendships with information on Muslim youths' Turkish-origin friends. For the analysis, I use a binary indicator, contrasting youth who indicate that "all or almost all" of their friends have a Turkish background with those who indicate a lower proportion. This binary categorization implicitly controls for differences in the opportunities that Muslim youth have to interact with Turkish-origin peers. Whether youth have "a few", "about half", or "a lot" of Turkish-background friends may be determined by how frequently they encounter Turkish-origin peers in their daily life. However, given limited segregation in the German context (Kruse 2016), opportunity structures alone are unlikely to result in Muslim youth having (almost) only friends with a Turkish background. Accordingly, having only or almost only Turkish-origin friends is likely to reflect active friendship-making choices that go beyond opportunity structures. I also show that results are robust to considering variation along the entire five-point scale, though.

In another robustness check, I consider information on Muslim youths' *non-Muslim* friends to capture in-group friendship-making. To this end, I again rely on a binary indicator that contrasts Muslim youth who indicate "none or very few" German-, Italian-, Polish-, and Russian-origin friends with those who have at least "a few" friends from at least one of these groups. Again, the underlying rationale is that opportunity structures alone are unlikely to prevent friendships with German-, Italian-, Polish-, and Russian-origin peers at the same time. Again, I also consider robustness to variation along the entire scale.

These measures of interreligious friendship-making are inherently imprecise to some degree. Even if Muslim youth do not only have Turkish-origin friends, the remainder of their friends may be Muslim as well but have an ethnic

[9]The religious affiliation of friends with other ethnic origin cannot be inferred, so I neglect them in the analysis.

background that is not captured in the data. Even if Muslim youth do not have German-, Polish-, Italian-, and Russian-origin friends, it is still possible that they have non-Muslim friends with a different ethnic background. Still, however, these measures are likely to provide an approximation of Muslim youths' tendencies to have Muslim and non-Muslim friends. Even more importantly, there is no obvious reason why errors in these approximations should systematically affect either boys or girls. Accordingly, even if there are errors in individual-level estimates of intergroup friendship-making, the *gender gap* in interreligious friendships should not be systematically biased.

Gender. Student gender was not re-assessed in wave 4 of the CILS4EU data, so I substitute this information with data provided in earlier waves. In the sample, 56% of Muslim youth indicated to be female, while 44% were male.

Endogamy norms. I capture adolescents' endogamy norms with the question "How important is it to you that your boyfriend/girlfriend has the same religion?" Respondents could rank having a partner with the same religion as "not at all important", "not very important", "rather important", or "very important". I also account for youths' perceptions of *parental endogamy* norms, which are captured with a corresponding question assessed on the same scale. Finally, to differentiate between norms for religious and ethnic endogamy, I also consider the importance that youth attach to having a partner with the same ethnic background, which is also assessed on the same scale.

Opportunities for intergroup contact in everyday activities. To factor in the influence of opportunities for intergroup friendship-making beyond the precautions taken with the dichotomization of the friendship measure, I use data from the third wave of CILS4EU. In wave 3, youth were asked how many of the people they interact with in their everyday school or work activities have a specific ethnic background. As in the assessment of friendship networks, the presence of Turkish-, German-, Italian-, Polish-, and Russian-origin people was assessed. For each group, youth could indicate that "none or very few", "a few", "about half", "a lot", or "all or almost all" of the people in these activities have a corresponding ethnic background. To account for opportunities for intergroup contact, I include information on Turkish-origin peers and the mean for peers with German, Italian, Polish, and Russian background.

Discrimination. I capture youths' experiences of discrimination with data from wave 3. I distinguish between discrimination in school, which is closest to capturing discrimination by peers, and discrimination in other contexts. Discrimination in school is assessed with an indicator asking about how often youth "feel discriminated against or treated unfairly in school". Youth could answer on a four-point scale ranging from "never" to "always". I capture discrimination in other contexts with three similar indicators that refer to discrimination in public

transport, in stores and similar establishments, and by the police or security guards. Again, youth could provide answers on a four-point scale ranging from "never" to "always", and I use the mean across the three indicators to capture the prevalence of discrimination.[10]

Religiosity. I measure adolescents' religiosity with three indicators. First, I consider the frequency of prayer, captured on a six-point scale ranging from "never" to "five times a day and more" and measured in wave 3. Second, I consider the frequency of mosque attendance, indicated on a five-point scale ranging from "never" to "daily", also measured in wave 3. Finally, I consider the subjective importance of religion, measured on a four-point scale ranging from "not important at all" to "very important", as recorded in wave 4.

Conservative sexual values. Next to endogamy norms, I also capture a series of other attitudes and norms on sexuality and family, all measured in wave 3. First, I capture adolescents' *chastity norms* with their attitudes towards unmarried cohabitation (discussed in more detail in Chapter 5). On a four-point scale, youth could indicate whether they think living together as a couple without being married is "never OK", "sometimes OK", "often OK", or "always OK". With the same question and answer scale, respondents were also asked about their opinions on homosexuality, divorce, and abortion. To capture *conservative sexual values* beyond cohabitation, I aggregate these three opinions and use their mean value in the analyses.[11]

Controls. To account for potential demographic differences between Muslim boys and girls, I include three control variables. First, I account for the school type youth indicated to have attended last, differentiating between "upper secondary school", "intermediate secondary school", "lower secondary school", "comprehensive school", and a residual category of other school types. Second, I capture socio-economic background, measured by parents' highest occupational status indicated on the ISEI scale. If available, I use occupational information from the parental interview (in wave 1). Otherwise, I employ information from the youth interview (from the wave closest to wave 4 with available information). Finally, I account for ethnic background, differentiating between

[10] The internal reliability of the scale is limited (Cronbach's alpha = .65). However, including each item separately in the analysis provides very similar results. To simplify the presentation, I therefore present results on the mean scale.

[11] I treat attitudes on cohabitation separately for two reasons. First, more than the other attitudes, the chastity norms that this indicator approximates have been linked in past research to constraints on cross-gender and interreligious friendships (e.g., Hawkey et al. 2018; Hennink et al. 1999). Second, chastity norms and the remaining attitudes on sexuality are gendered in very different ways. Chastity norms are notably stronger among Muslim girls than boys, but Muslim boys are more conservative with respect to all other items. The reliability of the scale of conservative attitudes towards sexuality is limited (Cronbach's alpha = .57). However, all results are very similar when including each item separately in the analysis. To simplify the presentation, I therefore present results on the mean scale.

Table 4.3: Overview of Variables by Gender (Study 2)

Variable	Mean (SD)/Proportion		Gender difference
	Girls	Boys	
In-group friendships			
(Almost) only Turkish-origin friends	0.38	0.27	**
Endogamy norms			
Importance of Muslim partner (W4)	0.76 (0.34)	0.59 (0.37)	***
Importance of same-ethnic partner (W4)	0.60 (0.37)	0.44 (0.35)	***
Parents: Importance of Muslim partner (W4)	0.85 (0.28)	0.70 (0.35)	***
Discrimination			
Discrimination in school (W3)	0.23 (0.51)	0.30 (0.55)	
Discrimination elsewhere (W3)	0.18 (0.28)	0.31 (0.44)	***
Opportunities			
Everyday interaction out-group (W3)	0.25 (0.15)	0.24 (0.15)	
Everyday interaction Turkish origin (W3)	0.57 (0.31)	0.49 (0.32)	**
Religiosity			
Frequency of mosque attendance (W3)	0.39 (0.27)	0.54 (0.28)	***
Frequency of prayer (W3)	0.47 (0.38)	0.53 (0.33)	†
Importance of religion (W4)	0.52 (0.33)	0.46 (0.32)	**
Norms on sexuality			
Chastity norms (W3)	0.66 (0.33)	0.58 (0.34)	**
Other conservative sexual values (W3)	0.68 (0.23)	0.80 (0.21)	***
Controls			
Turkish ethnic background	0.71	0.60	**
Highest parental ISEI	0.27 (0.22)	0.26 (0.22)	
School type			
lower secondary	0.31	0.39	
intermediate secondary	0.27	0.24	
upper secondary	0.17	0.12	
comprehensive	0.21	0.20	
other	0.04	0.04	

Note: $^{\dagger}p < .10$,$^{*}p < .05$,$^{**}p < .01$,$^{***}p < .001$. $N = 354$ girls and $N = 275$ boys.

youth with a Turkish background (66% of the sample) and those with other ethnic backgrounds. I classify students as having a Turkish background if they or at least one of their parents or grandparents were born in Turkey. Otherwise, I classify them to have a different ethnic background.

Table 4.3 gives a descriptive overview of all variables included in the analyses, scaled to an interval between 0 and 1 (see section on Methods below).

Methods

I use linear probability models (LPMs) with robust standard errors to assess the gender gap in in-group friendship-making. To simplify the comparison and interpretation of regression coefficients, I scale all variables to the interval between zero and one. Accordingly, regression coefficients represent differences between youth with the maximum compared to the minimum value on the corresponding variable. I use mediation analysis to investigate how the gender gap in in-group friendship-making changes when accounting for endogamy norms and potential alternative explanations (Tingley et al. 2014).

I rely on multiple imputation with chained equations to impute missing values for all covariates. To account for systematic differences in the covariates between boys and girls, I impute separately by gender. All analyses are based on a total of 20 imputed data sets, and results are combined across these 20 imputations using Rubin's rules (White et al. 2011).

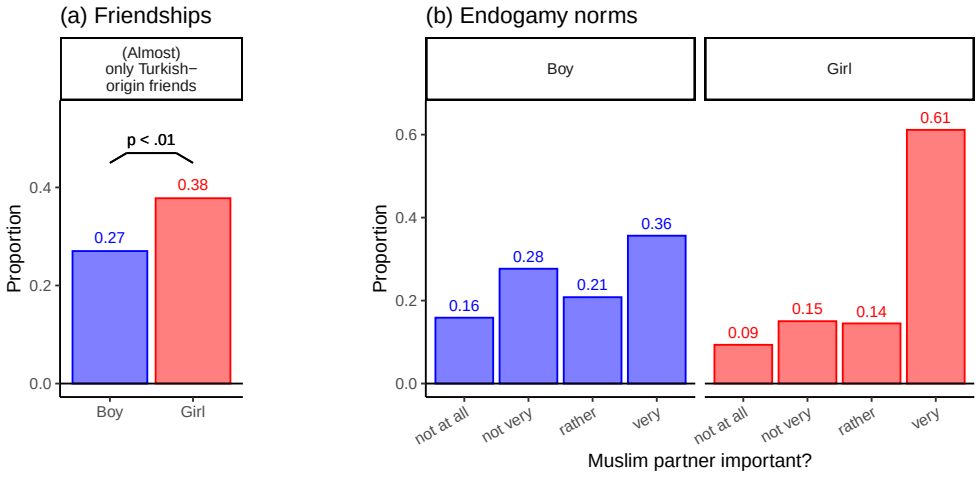
4.3.3 Results

Endogamy Norms and the Gender Gap in Intergroup Friendship-Making

In line with the expectations from Study 1 and previous chapters, panel a of Figure 4.5 documents a gap in in-group friendship-making between 18-19-year-old Muslim boys and girls. According to panel a, the proportion of Muslim girls who have (almost) only Turkish-origin friends stands at 38%. At the same time, only 27% of Muslim boys indicate having (almost) only Turkish-origin friends. This gender gap of 11 percentage points is statistically significant ($p < .01$). Table C.4 in Appendix C.3 highlights that all other operationalizations of in-group friendship-making are characterized by a significant gender gap as well (all $p < .05$).

Panel b of Figure 4.5 assesses whether *endogamy norms*, like in-group friendship-making, differ between Muslim boys and girls. This is a prerequisite for endogamy norms to be responsible for the observed gender gap in friendship-making. In line with expectations, Figure 4.5 demonstrates stronger endogamy norms among Muslim girls than Muslim boys. 61% of Muslim girls, but only 36%

Figure 4.5: In-Group Friendships and Endogamy Norms by Gender

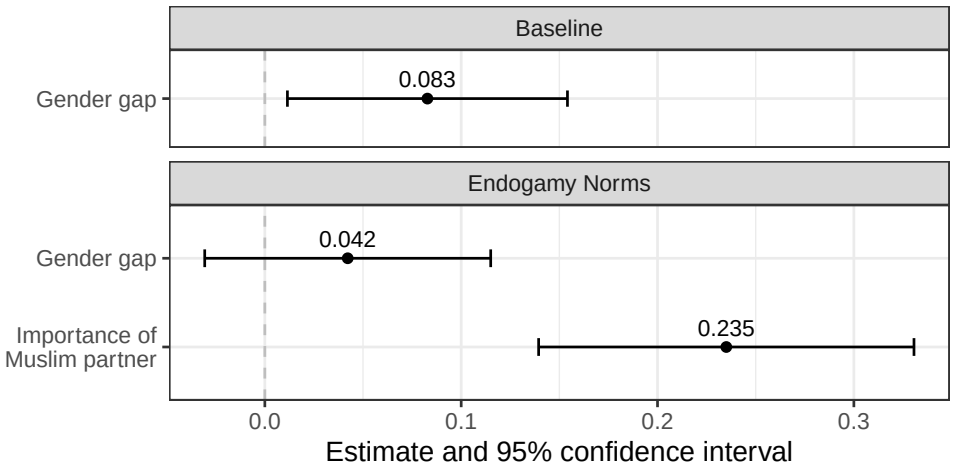


of Muslim boys, consider it very important to have a Muslim partner. Reversely, only 24% of Muslim girls consider their partner's religion not important at all or not very important. Among Muslim boys, this proportion amounts to 44%.

In Figure 4.6, I turn to the question of whether gendered endogamy norms can explain Muslim girls' stronger focus on friendships with Turkish-origin peers. To this end, Figure 4.6 first shows a re-estimation of the gender gap from a baseline model that adjusts for control variables (socio-economic status, school type, and ethnic background; see M0 in Table C.5, Appendix C.4 for full model results). According to the model, Muslim girls are 8.3 percentage points more likely than boys to have (almost) only Turkish friends. This adjusted gender gap, though slightly smaller than in the descriptive analysis in Figure 4.5, is statistically significant ($p < .05$).

In addition, Figure 4.6 provides estimates from an extended model that accounts for Muslim youths' endogamy norms (see M1 in Table C.5, Appendix C.4 for full model results). Results from this model show that endogamy norms are strongly linked to in-group friendship-making: Among youth who consider a Muslim partner very important, the probability of having (almost) only Turkish-origin friends is 23.5 percentage points higher than among youth who do not consider a Muslim partner important at all ($p < .001$). Given this strong association of endogamy norms with in-group friendship-making and the gender difference in endogamy norms, Figure 4.6 also shows that the gender gap decreases considerably when accounting for endogamy norms. In the model controlling for endogamy norms, the gender gap shrinks to 4.2 percentage points and is no longer statistically significant ($p > .1$). This amounts to a

Figure 4.6: Explaining the Gender Gap: The Contribution of Endogamy Norms



Note: Estimates on the probability of having (almost) only Turkish−origin friends from LPMs.

decrease of 49%, which itself is statistically significant ($p < .001$). This analysis thus suggests a substantial contribution of endogamy norms to the gender gap in in-group friendship-making.

Alternative Explanations for the Gender Gap

While Figure 4.6 gives the impression that gendered endogamy norms may be a driving force of gendered friendship-making, it does not account for alternative explanations for the gender gap. As a first step towards evaluating potential alternative explanations, I next consider various characteristics that may be both gendered and related to in-group friendships. I first analyze each of these characteristics separately. To do this, I assess gender differences in each characteristic, its association with in-group friendship-making, and the change in the gender gap once the characteristic is accounted for. The characteristics this analysis shows to be associated with a reduction in the gender gap constitute potential alternative explanations to gendered endogamy norms.

Figure 4.7 summarizes the results of this analysis, displaying whether *experiences of discrimination*, *opportunities for in- and out-group interaction*, *religiosity*, *norms on sexuality*, and *ethnic* and *religious endogamy norms* contribute to the gender gap in in-group friendship-making. For each characteristic, the bottom panel displays gender-specific means of the characteristic (standardized to a range between 0 and 1). The middle panel displays the coefficient estimate for the association with in-group friendship-making, while the top panel displays the gender gap after accounting for the characteristic in the regression analysis.

The dashed horizontal line indicates the baseline gender gap estimated from a model that includes controls but no endogamy norms or any of the potential alternative explanations for gendered friendship-making (i.e., the 8.3 percentage points from the baseline model in Figure 4.6).[12]

Figure 4.7 shows that neither *experiences of discrimination* nor broader indicators of *religiosity* contribute to the gender gap. Experiences of discrimination, which boys report more than girls, prove unrelated to in-group friendship-making. This holds true for the subjective importance of religiosity as well. By contrast, the frequency of prayer and mosque attendance is associated with a higher likelihood of having (almost) only Turkish-origin friends. However, because boys pray and attend the mosque more frequently than girls, accounting for these dimensions of religiosity enlarges rather than attenuates the gender gap.

In Figure 4.7, *opportunities* for in-group interaction emerge as one potential alternative explanation for the gender gap. According to Figure 4.7, Muslim girls encounter more Turkish-origin interaction partners in their everyday activities than Muslim boys. As these opportunities for in-group interaction are associated with a higher probability of having (almost) only Turkish-origin friends, the gender gap falls after accounting for the gender difference in opportunities ($p < .01$). By contrast, opportunities for out-group interaction neither vary notably by gender nor are strongly associated with in-group friendship-making.

[12] In Figure C.2 in Appendix C.3, I also consider potential gender-specific effects for all of the potential explanations of the gender gap investigated in Figure 4.7. This analysis provided no evidence that gender-specific effects contribute to the gender gap in interreligious friendship-making. Associations with in-group friendship-making were only gendered for experiences of discrimination and conservative sexual values, with both associations being stronger for girls than for boys. However, experiences of discrimination and conservative sexual values were more widespread among boys than girls. Therefore, these gendered effects do not contribute to the explanation of the gender gap. This is further substantiated by a re-analysis using Kitagawa-Oaxaca-Blinder decomposition, which also primarily attributes the gender gap to the different characteristics Muslim boys and girls hold rather than the different consequences of these characteristics for friendship-making. Also note that this is not in contradiction with the findings from Study 1. In Study 1, effects were gendered in particular for parental control. In this study, parental influence is captured not by parental control but by (perceived) parental endogamy norms. I expect that the stronger effect parental control has for girls in Study 1 corresponds to stronger endogamy norms for girls in this study (see Figure 4.7). Yet, I do not expect a stronger association of these endogamy norms with friendship-making among girls. Instead, I expect that strong parental endogamy norms come with a critical stance on close interreligious among both boys and girls. A gender gap in interreligious friendship-making should then emerge because these norms are, on average, stronger for girls than for boys.

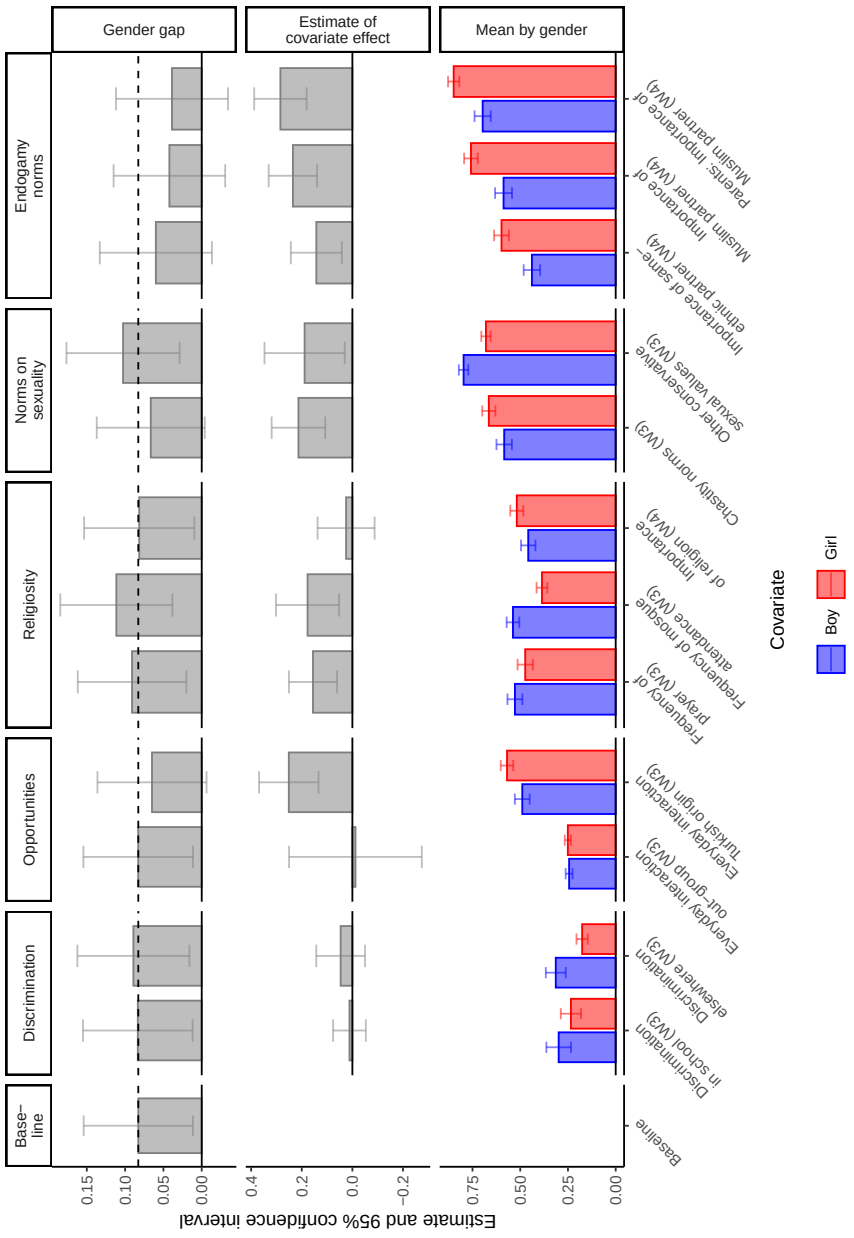


Figure 4.7: Explaining the Gender Gap: Gender Differences in Characteristics, Association with In-Group Friendship-Making, and Residual Gender Gap after Accounting for Characteristics

The two indicators of *norms on sexuality* highlight very different patterns. Figure 4.7 shows that Muslim girls hold stronger *chastity norms* than Muslim boys. As these norms are associated with a higher likelihood of having (almost) only Turkish-origin friends, the gender gap falls when chastity norms are accounted for ($p < .01$). By contrast, other attitudes on sexuality (concerning homosexuality, abortion, and divorce) are more conservative among boys than girls. As these conservative attitudes are also linked to in-group friendship-making, the gender gap becomes larger when they are accounted for.

Finally, Figure 4.7 reiterates the close link between endogamy norms, friendship-making, and the gender gap. Norms on ethnic endogamy and both adolescents' and their parents' (perceived) norms on religious endogamy are stronger for girls than boys. All three types of endogamy norms also are significantly associated with in-group friendship-making (all $p < .001$), and accounting for each of them leads to a reduction of the gender gap (all $p < .001$). However, given the stronger association of in-group friendship-making with both adolescents' and parents' religious endogamy norms than with ethnic endogamy norms, the explanatory power of ethnic endogamy norms pales compared to that of religious endogamy norms.[13]

In sum, next to religious endogamy norms (of Muslim youth and their parents), Figure 4.7 suggests three other factors that may contribute to the gender gap in in-group friendship-making: gendered opportunities for in-group interaction, gendered chastity norms, and gendered norms for ethnic endogamy. To evaluate both how much of the gender gap these characteristics jointly explain and whether endogamy norms remain associated with friendship-making after accounting for these alternative explanations, I turn next to a combined analysis.

Explaining the Gender Gap: A Combined Analysis

Table 4.4 shows the results from this analysis across six nested linear probability models (M0-M5). M0 again displays the baseline gender gap of 8.3 percentage points adjusted for control variables,[14], and M1 shows that, like in Figure 4.6 this gap falls to 4.2 percentage points when accounting for endogamy norms, a statistically significant decrease ($p < .001$).

[13] As robustness checks in Figure C.3 in Appendix C.3 show, this is not because the measure of friendship composition refers to Turkish-origin youth, who are same-ethnic peers for some but not all Muslim youth in the sample. The primacy of religious over ethnic endogamy norms also persists when considering friendships with German-, Italian-, Polish-, and Russian-origin peers, who have an ethnic background different from all the Muslim youth in the sample.

[14] All results are substantively similar when not only adjusting for control variables (ethnic background, socioeconomic status, and school type) but also for all the factors considered in Figure 4.7 that did not contribute to explaining the gender gap. Corresponding model results are documented in Appendix C.4, Table C.6.

Table 4.4: Explaining the Gender Gap: The Contribution of Endogamy Norms, Chastity Norms, and Opportunities

	M0	M1	M2	M3	M4	M5
Gender gap	0.083*	0.042	0.036	0.022	0.021	0.010
	(0.036)	(0.037)	(0.037)	(0.036)	(0.037)	(0.037)
Importance of		0.235***	0.198***	0.184***	0.180**	0.103
Muslim partner		(0.049)	(0.050)	(0.050)	(0.058)	(0.068)
Chastity norms			0.162**	0.162**	0.161**	0.160**
			(0.055)	(0.054)	(0.055)	(0.055)
Everyday interaction				0.235***	0.235***	0.226***
Turkish origin				(0.059)	(0.059)	(0.059)
Importance of					0.008	−0.007
same-ethnic partner					(0.059)	(0.060)
Parents: Importance of						0.178**
Muslim partner						(0.068)
Change in Gender gap		* * *		*		†
Change in Importance of Muslim partner			* * *	†		* * *

Note: †$p < .10$,* $p < .05$,** $p < .01$,*** $p < .001$; two-tailed tests. Change in estimate of the gender gap and of importance of Muslim partner assessed with formal mediation analysis (Tingley et al. 2014).

M2-M5 turn to alternative explanations of the gender gap. In addition to endogamy norms, M2 also accounts for *chastity norms*. In this combined analysis, strong chastity norms turn out to be associated with a higher probability of having (almost) only Turkish-origin friends ($p < .01$). When accounting for chastity norms, the gender gap decreases slightly, but this change is not statistically significant ($p > .1$). By contrast, the estimate of endogamy norms shrinks notably and significantly ($p < .001$) when accounting for chastity norms, indicating that both norms are positively correlated ($r = .26$). Still, the association between endogamy norms and in-group friendship-making remains substantial and statistically significant even after accounting for chastity norms ($p < .001$). Accordingly, though endogamy and chastity norms are correlated and each associated with in-group friendship-making, it is primarily endogamy norms that contribute to the gender gap in in-group friendship-making.[15]

M3 further accounts for adolescents' *opportunities* for the interaction with peers of Turkish origin in their everyday activities. Corresponding opportunities for in-group interaction are associated with a greater likelihood of having

[15]The greater explanatory power of endogamy compared to chastity norms for the gender gap results from a combination of endogamy norms' stronger association with friendship-making and, in particular, their stronger gendering. This is visible in Figure 4.7, which shows a stronger gender difference in endogamy than in chastity norms.

(almost) only Turkish-origin friends ($p < .001$). Because opportunities for interaction with Turkish-background peers are lower among Muslim boys than girls, the gender gap also falls when accounting for opportunities ($p < .05$). The coefficient estimate for endogamy norms decreases as well ($p < .1$), but only slightly so, and it remains statistically significant ($p < .001$). For the larger part, endogamy norms and opportunities for in-group interaction therefore contribute to the gender gap independently.

Explaining the Gender Gap: Which and Whose Endogamy Norms?

M4-M5 in Table 4.4 turn to the different types of endogamy norms that may be responsible for in-group friendship-making. M4 adjusts for ethnic endogamy norms. When accounting for these norms, there is no further change either in the gender gap or in the coefficient estimate for religious endogamy norms. After controlling for religious endogamy norms, *ethnic endogamy norms* prove unrelated to in-group friendship-making, with the corresponding point estimate being very close to zero. This finding attests to the primacy of religious over ethnic endogamy norms, in terms of both in-group friendship-making and the gender gap in friendships.

Finally, M5 accounts for *parental endogamy norms*. Parental endogamy norms are predictive of in-group friendship-making ($p < .01$) and, accounting for them, the gender gap falls further ($p. < 1$). At the same time, the estimate for *adolescents' own* endogamy norms shrinks considerably ($p < .001$) in M5 and is no longer statistically significant ($p = .13$). More clearly than the endogamy norms of Muslim youth themselves, it therefore is *parental* norms that are associated with in-group friendship-making in M5. This, however, should not be interpreted to indicate that youths' own endogamy norms are *irrelevant* for friendship-making. The corresponding point estimate is not only substantial and close to conventional levels of significance ($p = .13$). Parents' and adolescents' endogamy norms are also highly correlated ($r = .56$), which hampers the statistical separation of both estimates. Still, the significant link between parental endogamy norms and friendship-making in M5 is remarkable, suggesting that parental norms are linked to children's intergroup friendships not only indirectly through norm transmission but also more directly.

After having accounted for endogamy norms, chastity norms, and opportunities for in-group interaction in M5, the gender gap has decreased from an initial value of 8.3 percentage points to 1.0 percentage points, denoting a decrease of 88% percent. Accordingly, the considered characteristics can almost fully explain the gender gap in interreligious friendship-making. In fact, considering only the contribution of adolescents' and their parents' endogamy norms

already results in a drop of the gender gap by two thirds of its initial size, again attesting to the prime importance of gendered endogamy norms for gendered interreligious friendship-making.

Robustness to Alternative Measures of In-Group Friendship-Making

In Figure C.4 in Appendix C.3, I show that the key findings of this analysis are also robust to a variety of alternative operationalization of in-group friendship-making. Across all operationalizations, there is an initial, statistically significant gender gap in in-group friendship-making between Muslim boys and girls, and this gap falls substantially and is no longer statistically significant when accounting for adolescents' religious endogamy norms. In all specifications, opportunities for interaction with Turkish-origin peers are associated with a higher likelihood of in-group friendship-making, while ethnic endogamy norms are not predictive of friendship-making in any specification. Estimates for chastity norms vary in size and significance across specifications and are thus less consistently linked to in-group friendship-making than endogamy norms. Point estimates for all specifications also suggest that both adolescents' own and their parents' endogamy norms are associated with a stronger focus on in-group friendship-making. However, statistical significance varies across specifications, again highlighting the difficulty of separating the impact of these highly correlated norms. Therefore, while my analysis unequivocally highlights gendered religious endogamy norms as the key contributing factor to the gender gap in intergroup friendship-making, it is not fully conclusive on the relative impact of adolescents' and their parents' norms.

4.3.4 Summary

In this study, I have directly assessed the contribution of both endogamy norms and various potential alternative explanations to the gender gap in interreligious friendship-making, thereby addressing key limitations of Study 1. To do so, I relied on a sample of 18-19-year-old Muslim youth from the fourth wave of the CILS4EU project that I investigated with linear probability models and mediation analysis.

In these analyses, I found religious endogamy norms to be strongly associated with in-group friendship-making and notably stronger for Muslim girls than boys. Accordingly, accounting for adolescents' religious endogamy norms alone explained about half of the gap in the in-group friendship-making of Muslim boys and girls. Next to gendered endogamy norms, Muslim boys' lower opportunities for out-group interaction in their daily activities further contributed to the gender gap. Chastity norms were also associated with a stronger

focus on in-group friendship-making, but they contributed less to the gender gap. Even after accounting for these alternative explanations, the association between Muslim youths' endogamy norms and in-group friendship-making remained substantial.

Differentiating between norms on *religious endogamy* and *ethnic endogamy*, I found religious rather than ethnic endogamy norms to predict in-group friendship-making and contribute to the corresponding gender gap. Finally, distinguishing between the contribution of adolescents' own and their parents' norms proved challenging, because both types of norms were highly correlated. There was clearer evidence of an association of parental norms with in-group friendship-making, though point estimates also suggested adolescents' own norms to come with a stronger focus on in-group friendships.

These challenges notwithstanding, religious endogamy norms emerged as the factor most consistently associated with in-group friendship-making across all specifications considered. At the same time, endogamy norms were highly gendered, so accounting for their association with in-group friendship-making proved to better explain the gender gap in intergroup friendships than all other explanations investigated.

4.4 Discussion

In Chapters 2 and 3 of this book, I have demonstrated that mid-to-late adolescent Muslim girls tend to engage less in interreligious friendship-making than same-aged Muslim boys. In both chapters, I have suggested that this gender gap may be a consequence of *gendered endogamy norms* that not only constrain Muslim girls' intergroup romantic relationships but also their interreligious friendships. In this chapter, I relied on two empirical studies to collect more direct evidence on this presumed contribution of endogamy norms to Muslim youths' interreligious friendship-making.

In a first longitudinal developmental study, I found that Muslim girls' increasing religiosity, combined with the strong constraints from growing parental control on their out-group friendships, contributed to Muslim girls' increasing in-group bias. Together with changing leisure time activities, these factors explained about one third of the gender gap in interreligious friendship-making emerging throughout adolescence. As past research has tied religiosity, parental control, and leisure time activities to Muslim youths' gendered endogamy norms, these findings provide indirect evidence of the contribution of these norms to the gender gap.

In a second, cross-sectional study, I relied on explicit measures of endogamy norms to directly investigate their role in in-group friendship-making. Endogamy norms were strongly associated with in-group friendship-making and much stronger for Muslim girls. Accordingly, accounting for adolescents' endogamy norms decreased the observed gender gap in interreligious friendship-making by half, and considering youths' and parents' norms jointly reduced it to one third of its initial size. The contribution of endogamy norms to the gender gap also proved robust to alternative explanations. Parental norms were more clearly associated with in-group friendship-making than adolescents' norms, suggesting that parents shape their children's friendships not just indirectly through norm transmission but in a direct manner as well. However, adolescents' and their parents' norms were highly correlated, making it challenging to distinguish their contributions to the gender gap.

Relying on different conceptual approaches, data, and methods, both presented studies had distinct strengths and limitations. Therefore, the fact that they both point to gendered endogamy norms as a key factor contributing to the gender gap in interreligious friendship-making lends credence to this mechanism beyond the findings of each study individually.

Limitation and Directions for Future Research

Still, it is important to acknowledge remaining limitations of the studies discussed in this chapter. Both studies were characterized by limitations to *measurement*. While Study 1 relied on fine-grained information on friendship-making, it did not provide a direct measure of endogamy norms, forcing me to rely on factors past research has established to be closely connected to these norms. However, despite these well-established connections, these factors do not map onto endogamy norms perfectly. Therefore, Study 1 was prone to missing some influences of endogamy norms, but also at risk of partially misattributing variation in in-group friendship-making to endogamy norms rather than other changes in adolescence. Study 2 addressed these limitations by exploiting a direct measure of endogamy norms but was limited to coarser measures of friendship networks. In particular, I had to rely on information on friends' ethnic background rather than on their religion to study intergroup friendships and could not as thoroughly account for adolescents' opportunities for in-group friendship-making as in Study 1. While key findings persisted in various robustness checks, a reanalysis based on data that combines fine-grained information on friendship networks, direct measures of endogamy norms, and a sufficiently large sample of Muslim youth in future studies thus is desirable to corroborate the results.

Another measurement issue concerned the influence of parental relative to adolescents' own endogamy norms. To capture parental influence, the studies reported in this chapter relied on information on *perceptions* of parental control and parental norms, respectively. However, these perceptions do not necessarily correspond to reality. For example, it is conceivable that Muslim youth with strong endogamy norms do not even consider it possible that their parents may not share their own norms. A corresponding overestimation of the intergenerational correlation of norms due to the measurement of perceived rather than actual norms can have practical implications: The main reason why Study 2 faced challenges to differentiating between the impact of parents' and adolescents' norms was that both were highly correlated. Accordingly, measuring parental norms by surveying parents directly in future research rather than by relying on adolescents' perceptions may not only provide a more accurate assessment of parental norms in general. By reducing the correlation between adolescents' and parents' norms, it may also help to distinguish their respective contribution to in-group friendship-making more clearly.

In terms of analytical methods used to study the contribution of gendered endogamy norms to in-group friendship-making, future research would also benefit from applying a *social network approach* (such as the SAOMs used in Chapters 2-3). This was not possible in the studies discussed in this chapter. Given limited sample size, models in Study 1 were too complex to investigate with SAOMs, and in Study 2, social network models were not applicable due to the lack of sociometric friendship data. There are, however, important benefits to a network-analytical approach to the gender gap in inter-group friendships.

First, network models can incorporate various general network processes responsible for the evolution of networks over time. Some of these processes are known to *reinforce* existing tendencies towards making in-group friends. One example for this is transitive closure, the tendency to become friends with one's friends' friends (Goodreau et al. 2009). If there is an in-group bias among Muslim girls in adolescence, Muslim girls tend to have Muslim friends, who also tend to have Muslim friends. In this situation, transitive closure further aggravates the tendency towards in-group friendships. Accordingly, a part of the observed gender gap may not directly follow from endogamy norms, but from more general processes of friendship-making that reinforce the effects of these norms. In an analysis that does not rely on network models, this part of the gap remains unexplained, even when accounting for norms or the factors related to them. Therefore, general network processes may be partially responsible for the fact that the gender gap could not be fully explained, particularly in Study 1.

Second, longitudinal social network models could also provide more solid

conclusions on the direction of effects. Throughout this chapter, I have assumed endogamy norms (and the factors connected to them) to drive in-group friendship-making. However, the reverse is possible as well: Having in-group friends may strengthen Muslim youths' endogamy norms. In principle, it therefore is conceivable that, rather than gendered endogamy norms resulting in gendered in-group friendship-making, gendered friendship-making may result in gendered endogamy norms. Longitudinal social network models can disentangle these processes by modelling friendship-making based on endogamy norms and friends' influence on these norms simultaneously.

While acknowledging a residual risk of reciprocal effects between gendered friendship-making and gendered endogamy norms, it is also important to highlight observations that oppose a primacy of friends' influence on endogamy norms. First, this direction of effects is less plausible when, rather than adolescents' norms, parental norms are considered. Evidence on the influence of parental norms, either assessed directly or through parental control, was present in both studies discussed in this chapter. Second, if is not gendered endogamy norms that are responsible for the gender gap in friendship-making, this raises the follow-up question: *What is?* Across three chapters and four studies, I have considered various plausible alternative explanations, with little indication that they are the key force contributing to the gap. Given the absence of obvious alternative explanations, support from the qualitative literature, and highly consistent patterns in Chapters 2-4, gendered endogamy norms thus emerge as the candidate most likely to be responsible for the gap between Muslim boys' and girls' in-group friendship-making. Rather than only constraining their intergroup romantic relationships, gendered endogamy norms therefore also appear to interfere with adolescent Muslim girls' interreligious friendships.

Part II

Cross-Gender Friendship-Making

Chapter 5

Chastity Norms and the Cross-Gender Friendship-Making of Muslim and Non-Muslim Youth

A slightly different version of this chapter is under review at an international, peer-reviewed journal.

Abstract

Muslim youth are well-known to engage less in romantic relationships and sexual activity than their Western non-Muslim peers, an observation that is usually attributed to chastity norms that strongly oppose their premarital sexual activity. In this chapter, I ask whether these chastity norms also have consequences for cross-gender interaction beyond romantic relationships and lead to lower levels of cross-gender *friendship-making* among Muslim than non-Muslim youth. Spillover effects of chastity norms on friendship-making are unavoidable within the religious community context, where practices of gender segregation impose constraints on any form of close cross-gender interaction. However, we know much less about whether chastity norms also prevent cross-gender friendships when these constraints are lifted in other contexts, particularly in Western coeducational schools that provide ample opportunities for cross-gender interaction. How do Muslim youth engage in cross-gender friendships in these contexts, where individual norms and parental regulations are likely to be more influential than structural constraints on cross-gender interaction imposed by the religious community?

To investigate this, I apply multilevel exponential random graph models to large-scale data on adolescents' friendship networks in German schools, assessing whether Muslim and non-Muslim youth differ in their tendency to make cross-gender friends. I find cross-gender friendships to be generally infrequent, but notably rarer among Muslim than among non-Muslim youth. However, this lack of cross-gender friendship-making is limited to Muslim youth with strong chastity norms, while more liberal Muslim youth engage in cross-gender friendships just as frequently as non-Muslim youth. Among non-Muslim youth, chastity norms are unrelated to cross-gender friendship-making. Additional analyses show that adolescents' own rather than parental norms are decisive for cross-gender friendship-making. There is no evidence that chastity norms constrain the cross-gender friendships of Muslim girls more than those of Muslim boys, despite the gendering of chastity norms reported in previous research.

5.1 Introduction

In the first part of this book, I have studied adolescents' interreligious friendships. Now, in the second part, I turn to their cross-gender friendships.

Throughout childhood, the friendship networks of boys and girls are highly gender-segregated (Maccoby 1998; Mehta & Strough 2009). Gender homophily, the preference for same- over cross-gender friends, only starts to decrease in early adolescence, and friendship networks slowly become more gender-integrated as adolescence progresses (Mehta & Strough 2009; Strough & Covatto 2002). These emerging cross-gender friendships are important both for adolescents' individual development and for societal gender relations. Cross-gender friendships provide adolescents with social skills and perspective-taking essential for navigating the mixed-sex social and work environments of adult life and successfully engaging in romantic relationships (McDougall & Hymel 2007; Mehta & Strough 2009; Poulin & Pedersen 2007). They also are an important corrective to same-gender friendships, which are prone to fostering gendered interests, gender stereotypes, and sexist attitudes (Jenkins et al. 2023; Keener et al. 2013; Mehta & Strough 2009). Adolescent cross-gender friendships thus serve various developmental functions.

At the same time, cross-gender interaction comes under closer scrutiny in adolescence, in parallel with many youths' emerging romantic interest in the other gender (Collins et al. 2009). In the first part of this book, I collected evidence documenting that this development can trigger *endogamy norms* that not only complicate intergroup romance, but also interfere with interreligious friendships. However, next to endogamy norms, which target interreligious interaction specifically, there also are gender-related religious norms that can interfere with cross-gender relations more generally. In particular, *chastity norms* that strictly oppose premarital sex can induce great suspicion towards adolescent romantic relationships in highly religious families. Strong chastity norms are widespread among ethno-religious minorities in the West (Cense 2014; Dion & Dion 2001; Saharso et al. 2023), and, like other gender-related norms, they are best-documented in Muslim communities (Hennink et al. 1999; Kogan & Weißmann 2020; Saharso et al. 2023). In line with these strong norms, Western Muslim youth engage less in romantic relationships and sexual activity than their non-Muslim peers (de Graaf et al. 2017; Wong et al. 2017; Yahyaoui et al. 2013; Yip & Page 2016).

Just like endogamy norms seem to not only affect interreligious romance, the influence of chastity norms is not necessarily restricted to teenage dating and sexuality. Instead, chastity norms can also have spillover effects on cross-gender interaction more generally—including the cross-gender friendships I am

concerned with in in this part of the book. Again, evidence on the consequences of chastity norms on cross-gender interaction *beyond* romantic relationships is strongest in Muslim communities. In many Muslim-majority societies, chastity norms have traditionally inspired separation between the social lives of men and women to avoid risks of sexual temptation (Altinyelken 2022; Velayati 2016). In the West, many Muslims also practice gender separation both in the mosque and in activities surrounding their religious community, and consider it an appropriate means to enforce chastity norms (Scourfield et al. 2013; Williams et al. 2017; Altinyelken et al. 2022). Within Muslim communities, chastity norms therefore regulate not only romantic relationships, but also interfere with cross-gender relations more generally. Therefore, initiating cross-gender friendships in the religious community context is hardly possible for Muslim youth (Altinyelken 2022; Scourfield et al. 2013).

Outside of the religious community, however, Muslim youth are consistently exposed to cross-gender interaction in the highly gender-integrated Western societies (Altinyelken 2022). This holds true most clearly for Western schools, which are overwhelmingly coeducational and therefore provide ample opportunities for cross-gender interaction. However, we know very little about whether Muslim youth also refrain from cross-gender friendships when the constraints imposed by their religious communities are lifted in these gender-integrated contexts. In this chapter, I therefore ask how frequently Muslim youth engage in cross-gender friendships in Western schools, how this compares to non-Muslim adolescents, and how cross-gender interaction is shaped by chastity norms.

The few previous studies on the cross-gender friendships of Muslim youth do not differentiate between the different contexts youth can initiate friendships in (Basit 1997a; Hennink et al. 1999; McGrath & McGarry 2014; Sarroub 2010). Their key finding—that same-gender friendships predominate over cross-gender friendships—is thus not surprising, as opportunities to make cross-gender friends are limited in many of Muslim youths' out-of-school activities. Inferring Muslim youths' gender homophily—their own preference for same- over cross-gender friendships—and how it is shaped by chastity norms therefore is not possible with these studies.

In addition, all previous studies are qualitative case studies that focus on single Muslim communities and therefore do not provide a comparison between the cross-gender friendships of Muslim and non-Muslim youth. However, this comparison is vital to evaluating whether Muslim youths' friendship-making really is distinct from that of other Western youth. After all, even as their friendship networks become more gender-integrated over time, gender homophily also remains strong among Western non-Muslims (Poulin & Pedersen 2007; Strough & Covatto 2002). Accordingly, a predominance of same- over cross-gender

friendships tends to characterize all youths' friendship networks—Muslim and non-Muslim.

Finally, previous studies have investigated Muslim girls only, thereby lacking a comparison between the cross-gender friendships of Muslim boys and girls. While chastity norms apply to both Muslim boys and girls *in principle* (Hendrickx et al. 2002), they more strongly oppose Muslim girls' sexual activity *in practice* (Cense 2014; Hawkey et al. 2018), so Muslim boys' and girls' involvement in cross-gender friendships may vary.

In this study, I address these limitations by assessing the school-based same- and cross-gender friendships of Muslim and non-Muslim youth with large-scale survey data from the German part of the CILS4EU project (Kalter et al. 2019). The first goal of this research is to establish how strong gender segregation in school-based friendship networks is among Muslim youth, how it compares to gender segregation in the friendships of non-Muslim youth, and how it varies between boys and girls. As the school context provides Muslim youth with ample opportunities for cross-gender interaction, observed differences between Muslim and non-Muslim youth are suggestive of spillover effects of chastity norms on cross-gender friendships

The second goal is to investigate these potential spillover effects more directly. To that end, I assess how Muslim youths' cross-gender friendships vary by their chastity norms and how this compares to non-Muslim youth. In addition, I assess whether *parental* chastity norms and the broader restrictions to cross-gender interaction they often impose further affect school-based cross-gender friendships.

5.2 Theory

5.2.1 Religion, Romance, and Sexuality in Adolescence

In most Western countries, romantic relationships have become a "hallmark of adolescence" (Collins et al. 2009), and by late adolescence, a vast majority of Western youth have been involved in at least one romantic relationship (Carver et al. 2003). However, romantic relationships also trigger concerns, especially among parents, and particularly regarding issues related to sexual activity. While, in principle, premarital sex is widely accepted in secular Western societies (Kalmijn & Kraaykamp 2018; Kogan & Weißmann 2020), worries about its appropriate timing and circumstances remain widespread among parents (Longmore et al. 2009). Yet, concerns are much stronger in highly religious families (Kogan & Weißmann 2020; Saroglou 2019). Most major religions condemn sex before marriage and instead promote premarital chastity, so adolescent

romantic relationships and their potential for sexual activity are a fundamental threat for religious families (Beekers & Schrijvers 2020; Cense 2014; Saharso et al. 2023).

However, in many Christian communities in the West, norms against premarital sex have lost their urgency. Over time, mainline Christian churches have become less insistent on premarital chastity (Kogan & Weißmann 2020; Vignoli & Salvini 2014). Furthermore, in the face of increasing secularization, even many Western youth who still identify as Christian have started to only selectively comply with religious rules, frequently shedding norms about sexuality (Kalmijn & Kraaykamp 2018; Kogan & Weißmann 2020).

By contrast, chastity norms continue to prevail among devout Christians and in many ethno-religious minorities (Beekers & Schrijvers 2020; Hawkey et al. 2018; Saharso et al. 2023). Compared to other minorities, chastity norms are particularly widespread and strong among Muslims (Coleman & Testa 2008; Hennink et al. 1999; Saharso et al. 2023; Yip & Page 2016). These strong chastity norms have been attributed to persistently high levels of religiosity among Western Muslims (Jacob & Kalter 2013; Voas & Fleischmann 2012), as adherence to these norms rises with religiosity (Glas 2023; Saharso et al. 2023). Furthermore, family reputation is strongly linked to premarital sexual modesty in Muslim communities, so adolescent sexual activity threatens family honor (Abo-Zena 2019; Cinthio 2015; Saharso et al. 2023). Although, in principle, chastity norms apply to both genders, they are frequently stronger and more strictly enforced for girls (Buitelaar 2002; Cense 2014; Hendrickx et al. 2002), as family reputation mostly depends on female chastity (Munniksma et al. 2012; Saharso et al. 2023). Still, many Muslim boys also hold reservations against premarital sex (Coleman & Testa 2008; Saharso et al. 2023; Yip & Page 2016).

In line with the prevalence of strong chastity norms among both Muslim youth and their parents, romantic relationships are rarer among Muslim adolescents compared to their Christian and non-religious Western peers (de Graaf et al. 2017; Yahyaoui et al. 2013). If they are involved in romantic relationships, Muslim youth engage less in physical intimacy (Beekers & Schrijvers 2020; Saharso et al. 2023; Wong et al. 2017; Yip & Page 2016) and more frequently conceal relationships from their parents and the religious community (Cense 2014; Hendrickx et al. 2002; Saharso et al. 2023).

5.2.2 Beyond Romantic Relationships: Chastity Norms and Cross-Gender Friendships among Muslim Youth

Effects of chastity norms on Muslim youths' romantic relationships—which these norms target directly—are well-documented and hardly surprising. In

certain contexts, however, chastity norms can not only constrain romantic relationships, but also other forms of cross-gender interaction.

Within Muslim communities, chastity norms have traditionally tended to limit most close cross-gender interaction outside of the immediate family (Velayati 2016; Williams et al. 2017) and thus have been consequential not only for romantic relationships, but also for cross-gender friendships. This is reflected most directly in the separation of men from women in social gatherings, a practice that tends to persist in Muslim communities in the West (Altinyelken 2022; Velayati 2016). Men and women do not only typically attend mosques separately; many of the religious activities Muslim youth are involved in, such as non-formal Islamic education or religious summer camps and excursions, are also gender-segregated (Altinyelken 2022; Scourfield et al. 2013; Williams et al. 2017). Though this separation of boys from girls also reflects cultural conventions, it is frequently motivated by an explicit attempt to avoid inappropriate cross-gender relations and sexual temptation (Altinyelken 2022; Velayati 2016; Williams et al. 2017). By strongly limiting opportunities for cross-gender interaction, communal chastity norms thus clearly constrain cross-gender friendships in the context of Western Muslim religious communities.

Outside of the religious community, however, many Muslim youth have ample opportunities for cross-gender interaction. Most domains of Western societies are gender-integrated, and Muslim youth participate in these contexts on a daily basis, particularly in coeducational schools (Altinyelken 2022). In these contexts, the initiation of cross-gender friendships primarily becomes a question of gender homophily—the preference for same- over cross-gender interaction—rather than of limited opportunities. Of course, this does not negate an influence of youths' own, their parents, or the religious community's chastity norms on cross-gender friendship-making. However, the pathway this influence operates through changes: Rather than by restricting opportunities for cross-gender interaction, norms can affect cross-gender friendships in these contexts by restricting Muslim youths' willingness to engage in friendships across gender lines, amplifying their gender homophily.

How likely is an interference of chastity norms in school-based cross-gender friendship-making? According to the literature, chastity norms come with a range of different opinions on cross-gender interaction among Western Muslim youth. For many Muslim youth, cross-gender interaction is a normal part of everyday (school) life (Altinyelken 2022; Basit 1997a), and many of them effortlessly "code-switch" (Altinyelken 2022) between the different regulations on cross-gender interaction that govern the religious community and the Western school context. Some Muslim youth explicitly speak up for cross-gender

friendships, though they also tend to impose some boundaries on these relationships by limiting physical contact and other behavior that could be perceived to signal romantic or sexual interest (Maddanu 2016; Mir 2009). For these youth, strong chastity norms and cross-gender friendships are no contradiction, so their gender homophily is unlikely to be stronger than those of non-Muslims.

However, other Muslim youth have internalized family or community norms that favor more wide-ranging restrictions to cross-gender relations (Altinyelken 2022; Mir 2009). In line with traditional justifications of gender segregation, these youth consider close cross-gender interaction an unnecessary risk of sexual temptation (Giuliani et al. 2017; Grønli Rosten & Smette 2023; Sarroub 2010). Therefore, they avoid close cross-gender interaction on more principle grounds and frequently consider cross-gender friendships inappropriate (Cinthio 2015; Grønli Rosten & Smette 2023), suggesting strong gender homophily.

In past research, this link between chastity norms and an avoidance of cross-gender interaction more broadly has mostly been documented among Muslim *girls* (Basit 1997a; Giuliani et al. 2017; McGrath & McGarry 2014). This is in line with the greater strength of chastity norms among Muslim girls (Buitelaar 2002; Cense 2014; Hendrickx et al. 2002) and stronger family and community efforts to ensure that Muslim girls internalize these norms (Abo-Zena 2019; Giuliani et al. 2017; Hennink et al. 1999).

Even more clearly, a disapproval of close cross-gender interaction is visible among Muslim parents, and this disapproval also tends to be stronger for girls than for boys (Basit 1997a; McGrath & McGarry 2014; Saharso et al. 2023). Accordingly, some Muslim girls report that they are not allowed to participate in activities that provide cross-gender exposure, such as going out with friends or visiting discos and parties (Basit 1997a; McGrath & McGarry 2014; Hennink et al. 1999). In some cases, parents also explicitly prohibit friendships with cross-gender peers (Cinthio 2015; Hawkey et al. 2018; Hennink et al. 1999) or even any closer interaction beyond what is strictly necessary, also in school (Basit 1997a; Cinthio 2015; McGrath & McGarry 2014).

Even though many Muslim youth consider strong chastity norms compatible with cross-gender friendships, these considerations highlight that some are likely to face constraints to school-based cross-gender friendship-making, either due to their own norms or due the consequences of parental regulation.

5.2.3 Chastity Norms and Cross-Gender Friendships among Non-Muslim Youth

Though more widespread among Muslim youth, some non-Muslims also hold strong chastity norms. Norms against premarital sex are rare among secular

Christian and non-religious adolescents (Kogan & Weißmann 2020; la Roi & Mood 2022) but more frequent among devout Christians (Beekers & Schrijvers 2020; Williams et al. 2017). If Christian youth also interpret these norms to not only constrain romantic relationships, but cross-gender relations more broadly, they may in principle interfere with cross-gender friendship-making just like those of Muslim adolescents.

In Christian communities, however, chastity norms usually are less associated with broad restrictions to cross-gender interaction than in Muslim communities. Even conservative Christian communities frequently receive cross-gender friendships positively and tolerate adolescent romantic relationships, as long as physical intimacy is postponed (Beekers & Schrijvers 2020; Williams et al. 2017). Practices of gender separation are rare in these communities, and they primarily uphold chastity norms by appeals to individual responsibility and peer surveillance (Beekers & Schrijvers 2020; Williams et al. 2017). Even though the chastity norm of devout Christian adolescents and their parents may be just as strong as those of Muslim youth, I therefore expect them to be less likely to result in strong gender homophily.

5.2.4 Summary of Expectations

Summing up, strong chastity norms are likely to result in strong gender homophily among at least some Muslim youth, independent of the ample opportunities for cross-gender interaction Western schools provide them with. This can be because Muslim youth consider close cross-gender relations problematic due to their own chastity norms or because parents with strong norms exert pressure to avoid cross-gender friendships. These processes are likely to be amplified among Muslim girls, who chastity norms are applied to more than to boys.

As chastity norms are less widespread among non-Muslim youth and less likely to affect cross-gender friendships, I expect gender homophily to be weaker among them than among Muslim youth. On average, I therefore expect Muslim youth to be less involved in cross-gender friendships than their non-Muslim peers.

5.3 Data and Methods

5.3.1 Data

To investigate the cross-gender friendships of Muslim and non-Muslim youth, I use data from the first wave of the German part of the *Children of Immigrants Longitudinal Survey in Four European Countries* (CILS4EU, Kalter et al. 2016a,

2019). In 2010-2011, CILS4EU surveyed 14–15-year-old students in randomly selected German schools. Because CILS4EU oversampled schools with a high proportion of ethnic minority students, the data contains information on a substantial number of Muslim youth. In each school, all students in two randomly selected 9^{th}-grade classrooms were surveyed. Next to a questionnaire on individual characteristics, CILS4EU also contained a sociometric questionnaire to assess students' friendships with their classroom peers and a survey with one of the students' parents (in most cases, the mother).

In total, 5,013 students in 271 classrooms participated in the first wave of the German sample. In the analysis in this chapter, I include all students who provide valid information on their religious affiliation and all classrooms that contain both Muslim and non-Muslim youth. Given these inclusion criteria, the analytical sample consists of 3,913 students nested in 209 classrooms.[1]

5.3.2 Variables

Friendship networks. Next to a survey on adolescents' individual characteristics, CILS4EU also contained a sociometric questionnaire that provides data on adolescents' classroom friends. Students could nominate up to five best friends from a list of all students in their classroom. As all students in a classroom were sampled, data on the complete classroom friendship network is available. On average, students nominated 3.73 friends.

Gender. Students could self-identity as either male or female; 48% of the sample are girls, and 52% of the sample are boys.

Religion. Students could indicate their religious affiliation, either from a predefined list or as an open-ended answer. Muslim students constitute 30% of the sample and non-Muslims the remaining 70%. In some of the analyses, I further disaggregate non-Muslims into Christian respondents (78% of non-Muslim students), respondents with *no religious affiliation* (15% of non-Muslim students), and respondents with *other religious affiliations* (7% non-Muslim students). Given the small number of students with another religious affiliation (204 in total), estimates for this group are very imprecise and can hardly be interpreted substantively. Therefore, I do not discuss them separately in the results section. However, I return to this issue in more detail in the discussion.[2]

[1] All substantive results are also robust to analyses that limit the sample to clasrooms with low levels of student non-response (30% or less). However, as cross-gender friendships are generally *rare*, obtaining precise estimates is particularly challenging in this application. Therefore, I rely on the larger sample for my main analysis reported in this chapter.

[2] I still include students with other religious affiliations in the analyses to ensure that friendship networks are not distorted by excluding a subset of the students.

Chastity norms. Both adolescents and parents were asked whether they think it is acceptable for a *couple to live together without being married*. Respondents could indicate unmarried cohabitation to be "always OK" (0), "often OK" (1), "sometimes OK" (2), or "never OK" (3), and I use their response as a measure of chastity norms. Though this item does not refer to premarital sex explicitly, cohabitation without marriage is highly suggestive of premarital sexual activity (Kogan & Weißmann 2020). Accordingly, this measure has been used to capture sexual attitudes in previous research with the CILS4EU data (Kogan & Weißmann 2020), and other research also shows that attitudes towards cohabitation and premarital sex are strongly related and similarly predicted by various covariates (Ogland & Hinojosa 2012).

Ethnic background and socioeconomic status. I capture students' ethnic background with data on their own, their parents', and their grandparents' country of birth. I classify students with all ancestors born in Germany as native and other students as immigrant-origin according to their own and their ancestors' country of birth, in line with standard procedures for the CILS4EU data (Dollmann et al. 2014). I capture socioeconomic status with information on parents' occupational status measured on the International Socio-Economic Index (ISEI) scale. I use data from the parental survey if available; otherwise, I use the information adolescents provide. I capture socioeconomic status with the ISEI score for the parent with the higher occupational status.

Missing values. I use multiple imputation with chained equations to impute missing values for all covariates.[3] This mostly affects the measure of parental chastity norms, because 18% of parents did not participate in the survey. All analyses are based on a total of 30 imputed data sets, and results are combined across these 30 imputations using Rubin's rules (White et al. 2011).

5.3.3 Method: Multilevel Exponential Random Graph Models

I use *multilevel exponential random graph models* to analyze Muslim and non-Muslim adolescents' cross-gender friendships. Exponential random graph models (ERGMs, Lusher et al. 2013) model the structure of cross-sectional social networks and estimate the probability of friendship ties as a function of covariates, while keeping the remainder of the friendship network constant. ERGMs can account for the effects of individual characteristics (e.g., being male or female), dyadic characteristics (e.g., sharing the same gender), and other network configurations (e.g., receiving someone else's friendship nomination)

[3]To account for systematic differences between religious groups (in chastity norms, for example), I impute separately for each religious group. Before the imputation, I replace missing covariate data with data from the second or third wave of the CILS4EU survey if available.

on friendship-making. Multilevel ERGMs are a recent extension to ERGMs that model the structure of multiple networks to obtain a joint set of estimates across networks (Stewart et al. 2019). The classrooms in the CILS4EU data are too small to estimate complex ERGMs on single networks, particularly for rare events like cross-gender friendships. Multilevel ERGMs solve this problem by combining estimates across multiple smaller classroom networks.

Multilevel ERGMs are not as flexible as the multilevel random-coefficients SAOMs discussed in Chapter 2. In particular, multilevel ERGMs do not allow to model variation in parameters across networks with random effects (see Chapter 2 for a detailed discussion).[4] Instead, multilevel ERGMs provide the option to estimate parameters as a function of network *size* (Stewart et al. 2019), as ERGM parameters may systematically vary according to the size of the networks they are estimated on. For the analyses, I have estimated both models with and without size-adjusted parameters; all substantive results were identical, but convergence was better for models without size adjustment. Therefore, I report results from models without adjustment for size in this chapter.[5]

Like regular ERGMs, multilevel ERGMs are estimated with Markov Chain Monte Carlo simulation; all reported models have converged. To facilitate interpretation, I report average marginal effects (AMEs) on the probability of a friendship tie for all ERGM coefficients, which have recently been introduced into the ERGM framework (Duxbury 2023). Other than ERGM logit coefficients, AMEs can be interpreted in terms of their substantive size.

Model Specification

The substantive focus of the multilevel ERGMs is on *gender homophily*, referring to adolescents' preference to make same- vs. cross-gender friends. I capture gender homophily with the *nodematch* gender effect, which estimates the probability of same- to cross-gender friendships net of all other effects in the model. To investigate whether gender homophily varies by religion and chastity norms, I include interaction effects of the *nodematch gender* effect with these covariates.

All models account for a series of additional effects. The edges parameter captures the baseline probability of friendships and is akin to a regression constant. I also account for *reciprocity* and *transitive closure*, two structural network effects. Reciprocity (modeled with the *mutual* effect) accounts for adolescents'

[4] I rely on cross-sectional ERGMs rather than SAOMs in this chapter because cross-gender friendships are rare events. Estimating systematic differences in the prevalence of these rare events between Muslim and non-Muslim youth therefore is challening. This problem is aggravated in longitudinal analyses that estimate parameters based on intertemporal variation. In this application, I therefore instead exploit cross-sectional variation.

[5] Though classroom networks vary in size, this variation is only moderate, so finding similar results with and without adjustment for network size is expected.

tendency to reciprocate incoming friendship nominations. Transitive closure (modeled with the *generalized weighted edge-wise shared partners (GWESP) effect*) accounts for the tendency to become friends with the friends of one's own friends.[6] Not accounting for these structural network effects risks overestimating gender homophily (Goodreau et al. 2009). I also account for the tendency to make friends with classmates with the same religious background, ethnic background, and similar socio-economic status. If gender is correlated with these characteristics, ignoring them can result in an overestimation of gender homophily. At the population level, gender is independent of ethnic background, religion, or socioeconomic status. However, by pure chance, correlations are likely in smaller contexts, such as individual classrooms (Kroneberg et al. 2021).

5.4 Results

5.4.1 Chastity Norms and Cross-Gender Friendships among Muslim and Non-Muslim Youth

Previous research suggests chastity norms to be more widespread among Muslim than non-Muslim youth in the West. Figure 5.1, which displays attitudes towards cohabitation among Muslim, Christian, and non-religious adolescents, supports this observation. 38% of Muslim youth consider cohabitation to be never OK. By contrast, the proportion of non-Muslim youth who consider cohabitation never OK is negligible, with only 3% of Christian and 1% of non-religious youth holding this opinion. Conversely, only 12% of Muslim youth consider cohabitation always OK, while a majority of Christian (53%) and non-religious youth (62%) hold no reservations on cohabitation at all.[7]

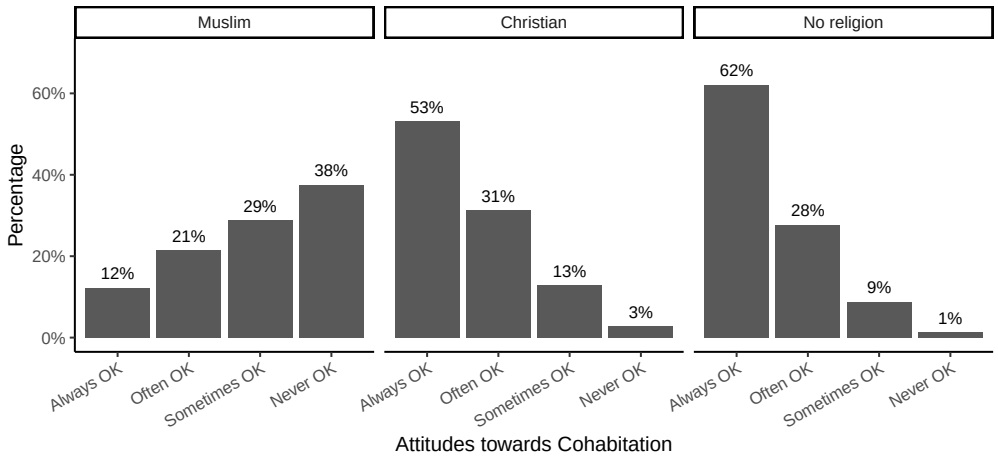
Are differences in chastity norms also reflected in differences in cross-gender friendships? To investigate this, Figure 5.2 provides descriptive information based on two measures: the average proportion of cross-gender friends in adolescents' friendship networks (top row) and the proportion of adolescents with any cross-gender friends (bottom row).

The left panel depicts the prevalence of cross-gender friendships in the overall analytical sample. Cross-gender friendships are generally rare in adolescents' classroom networks: Only 34% of all adolescents nominate *any* cross-gender

[6] Average marginal effects for ERGMs require fixing the decay parameter of the GWESP effect. To fix the parameter at an appropriate value, I first estimated multilevel ERGMs with a free decay parameter but without average marginal effects and then fixed the decay parameter at the estimate of 0.30 for the final analysis.

[7] Among youth with other religious affiliations, 12% consider cohabitation never OK, and 33% consider cohabitation always OK, with the majority of adolescents holding positions in-between. Remember, however, that this group is very small, and I therefore refrain from reporting cross-gender friendships on it subsequently, given highly imprecise estimates.

Figure 5.1: Attitudes towards Cohabitation among Muslim, Christian, and Non-Religious Youth

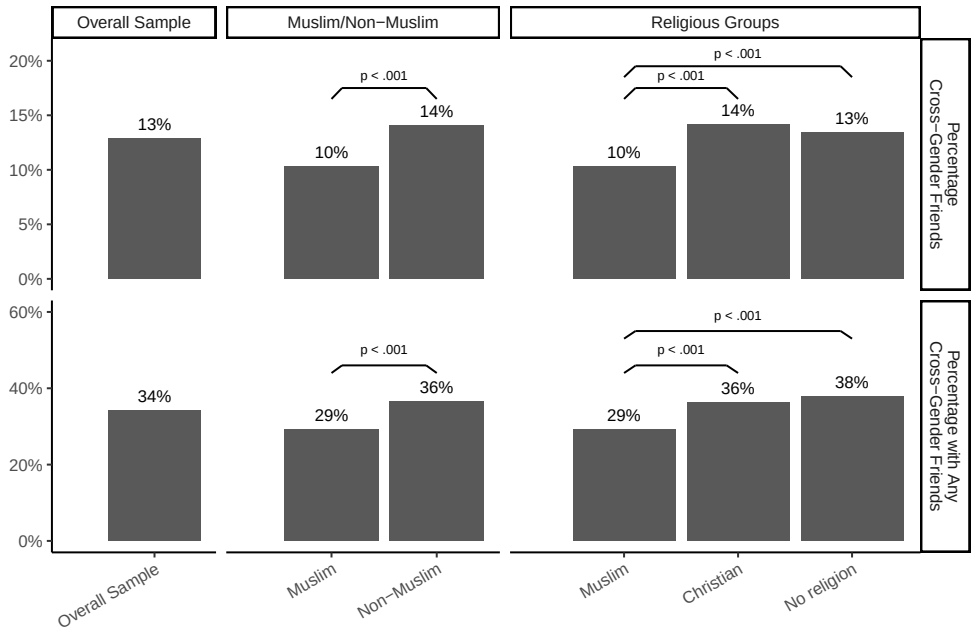


friends in class, and, on average, only 13% of adolescents' friendships cross gender lines.

According to the middle panel, gender segregation prevails among both Muslim and non-Muslim youth but also differs between both groups. While 36% of non-Muslim youth nominate at least one cross-gender friend, only 29% of Muslim adolescents do so, indicating a difference of seven percentage points ($p < .001$). Similarly, an average of 14% of non-Muslims' friendships cross gender lines, but cross-gender friends make up only 10% of Muslims' friendships. Given the overall paucity of cross-gender friendships, this difference is not only statistically ($p < .001$) but also substantively significant: For each two cross-gender friendships among Muslim youth, there are almost three cross-gender friendships among non-Muslim youth. Still, these differences should not belie that cross-gender friendships are generally rare in classroom friendship networks, both among Muslim and non-Muslim youth.

The right panel further differentiates non-Muslims into *Christian* and *non-religious* youth. Christian and non-religious youth have very similar patterns of cross-gender friendships: 14% of the friendships of Christian and 13% of the friendships of non-religious youth are with cross-gender peers. 38% of non-religious adolescents indicate to have cross-gender friends, slightly more than the 36% among Christians. Yet, none of these differences are statistically significant. While Christian and non-religious youth thus have very similar patterns of gender segregation, they markedly differ from Muslim youth, who have fewer cross-gender friends.

Figure 5.2: Percentage of Cross-Gender Friendships and Percentage of Adolescents with Any-Cross-Gender Friendships



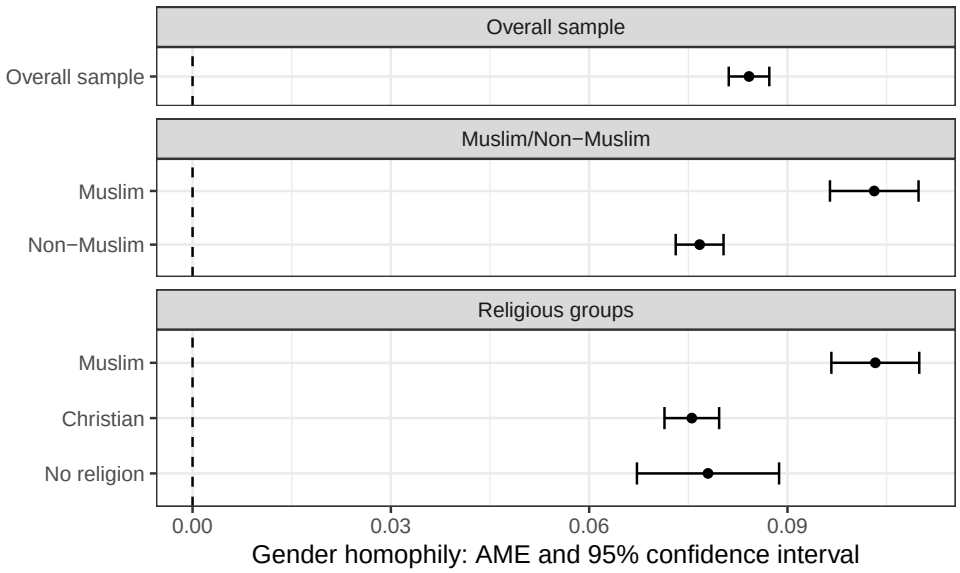
5.4.2 Gender Homophily among Muslim and Non-Muslim Youth: Results from the Multilevel ERGM Analysis

In Figure 5.3, I investigate whether these differences also persist in multilevel ERGM analyses (see Table D.1 in Appendix D.1 for full model results). The ERGMs account for adolescents' opportunities for cross-gender friendships, structural network processes, and the contribution of ethnic, religious, and socio-economic background on friendships. Rather than descriptive patterns of gender segregation, the ERGMs thus capture *gender homophily*, adolescents' preference to make same- rather than cross-gender friends, adjusted for all other processes considered.

The key conclusions from the descriptive analysis also hold up in the multilevel ERGM results: For the overall sample, the top panel of Figure 5.3 shows substantial gender homophily: Students with the same gender are 8.4 percentage points more likely to be friends than students of a different gender ($p < .001$). The baseline probability of a friendship is about 21%[8]. Accordingly, having the same gender increases the average probability of a friendship by 40%, attesting to the prime importance of gender in adolescent friendship networks. Gender

[8]On average, adolescents nominate 3.73 friends in classroom networks consisting of an average of 18.72 students, so the average proportion of friends is $3.73/(18.72-1) = 20.93\%$.

Figure 5.3: Estimates of Gender Homophily in the Overall Sample and by Religious Group from Multilevel ERGMs

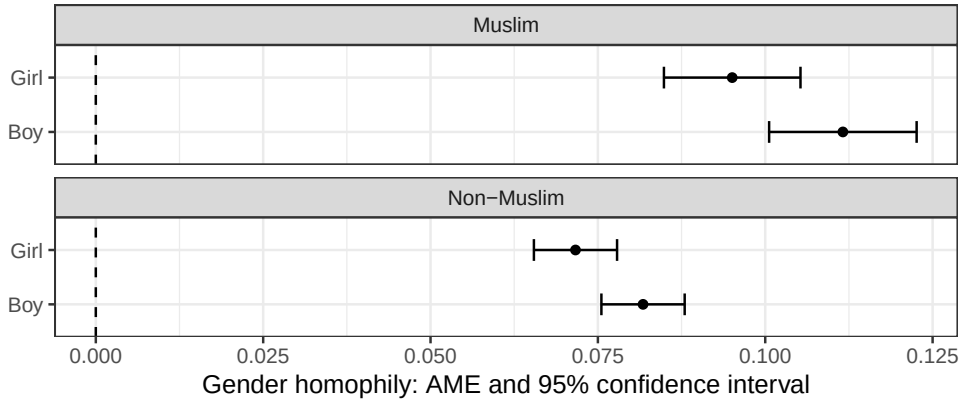


homophily is much stronger than the tendency to make same-ethnic or same-religious friends (1.0 and 1.1 percentage points each, about 5%; see Table D.1 in Appendix D.1) or to make friends with peers who have similar socio-economic status (1.5 percentage points when comparing maximum similarity to maximum dissimilarity, about 7%).

The middle panel shows that gender homophily is stronger among Muslim than non-Muslim youth. While non-Muslim youth are 7.7 percentage points more likely to make same- than cross-gender friends, this difference is 10.3 percentage points among Muslim youth. The difference is statistically significant ($p < .001$) and with 2.6 percentage points, it trumps the consequences of sharing an ethnic, religious, or socioeconomic background. The lower panel shows gender homophily to be very similar among Christian and non-religious youth and notably weaker than among Muslim youth ($p < .001$ for both differences).

These results demonstrate that Muslim youth less frequently have cross-gender friends than non-Muslim youth. Other than in previous studies, the analysis controls for adolescents' opportunities to engage in cross-gender friendships. Therefore, differences cannot be a consequence of Muslim youths' limited access to cross-gender peers but are driven by their individual tendency of engaging in same- rather than cross-gender friendships.

Figure 5.4: Estimates of Gender Homophily among Muslim and Non-Muslim Boys and Girls from Multilevel ERGMs



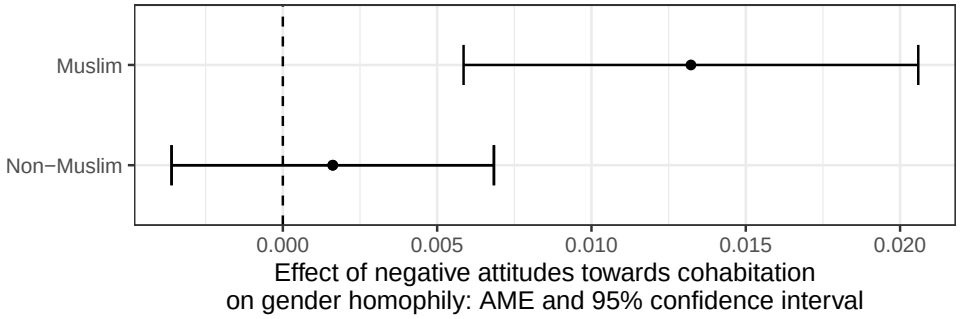
5.4.3 Gendered Gender Homophily?

In line with previous research, chastity norms are also stronger among Muslim girls than Muslim boys in my sample. While only 28% of Muslim boys consider unmarried cohabitation never OK, 48% of Muslim girls share this conviction. Conversely, only 26% of Muslim girls consider cohabitation always or often OK, while the corresponding proportion is 42% among Muslim boys. Accordingly, if strong chastity norms constrain cross-gender interaction, the gender homophily of Muslim girls may exceed that of Muslim boys. To investigate this gender difference, Figure 5.4 displays separate estimates of gender homophily for non-Muslim boys, non-Muslim girls, Muslim boys, and Muslim girls (see Table D.2 in Appendix D.1 for full model results).

Unexpectedly, Figure 5.4 shows that gender homophily is stronger among Muslim *boys* than Muslim *girls* ($p < .05$). However, this pattern is not unique to Muslim youth. Non-Muslim boys also have stronger gender homophily than non-Muslim girls ($p < .05$), meaning that across religious boundaries, girls tend to be more open to cross-gender friendships.[9] This may reflect that, even though boys and girls have the same average age in the sample, they differ in their developmental status and, accordingly, in their openness to cross-gender friendships (Poulin & Pedersen 2007). Still, because this gender difference is very similar among Muslim and non-Muslim youth, the results do not indicate that Muslim girls face specific constraints to cross-gender friendships; in the

[9]Note that this difference in gender homophily between boys and girls does not imply (strong) asymmetry in actual cross-gender friendships. Estimates of gender homophily do not have a one-on-one relationship with realized friendships, as they reflect individual behavioral tendencies for same- and cross-gender interaction after accounting for all other sources of friendship-making considered in the multilevel ERGMs.

Figure 5.5: Estimates of Variation in Gender Homophily by Attitudes towards Cohabitation among Muslim and Non-Muslim Youth from Multilevel ERGMs



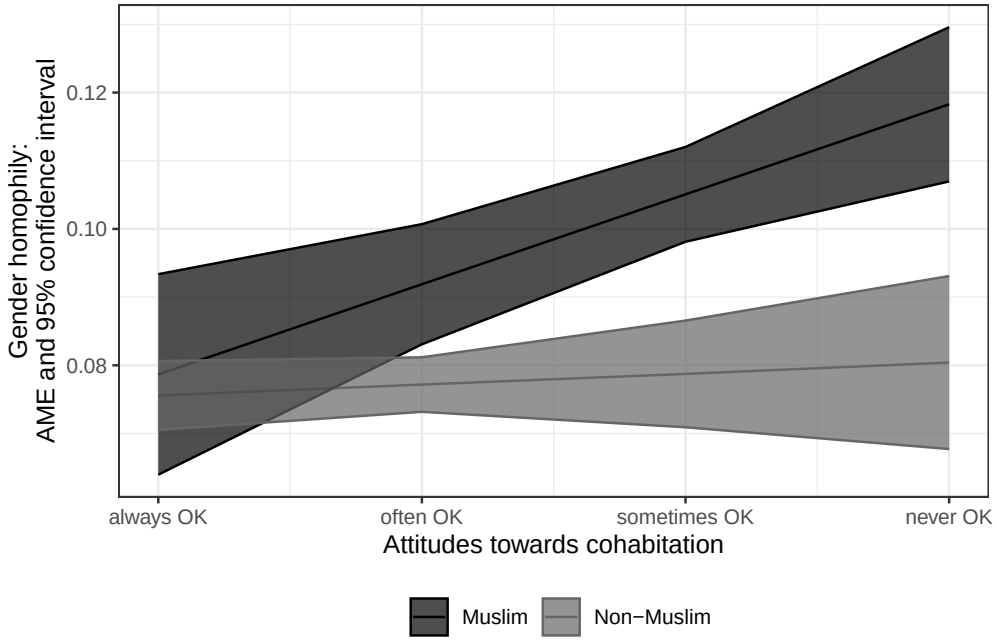
presence of such constraints, the gender gap in homophily should be smaller among non-Muslim than Muslim youth.

5.4.4 Chastity Norms and Gender Homophily among Muslim and Non-Muslim Youth

In Figure 5.5, I turn to the question whether cross-gender friendship-making varies by Muslim and non-Muslim youths' chastity norms. Figure 5.5 provides estimates for variation in gender homophily according to adolescents' attitudes towards unmarried cohabitation, showing coefficients separately for Muslim and non-Muslim youth (see Table D.3 in Appendix D.1 for full model results; for ease of interpretation, Figures 5.5-5.7 display reversed coefficients, which indicate variation by more *negative* attitudes towards cohabitation). Among non-Muslim youth, gender homophily is independent of attitudes towards cohabitation, with a point estimate close to zero that is far from statistically significant ($p > .1$)[10]. By contrast, more negative attitudes towards unmarried cohabitation are associated with stronger gender homophily among Muslim youth. The estimate is statistically significant ($p < .01$), as is the difference to the estimate for non-Muslim youth ($p < .05$). In line with expectations, cross-gender friendship-making therefore varies by Muslim youths' chastity norms, but not by non-Muslim youths' chastity norms. In Figure D.2 in Appendix D.2, I show that gender homophily varies by attitudes towards cohabitation among both girls ($p < .01$) and boys ($p < .1$). Though, according to the point estimate, variation by attitudes towards cohabitation is slightly stronger among Muslim girls, the gender difference itself is not statistically significant.

[10]This independence of cross-gender friendships and attitudes towards cohabitation holds among both Christian and non-religious youth, as shown in Appendix D.2, Figure D.1.

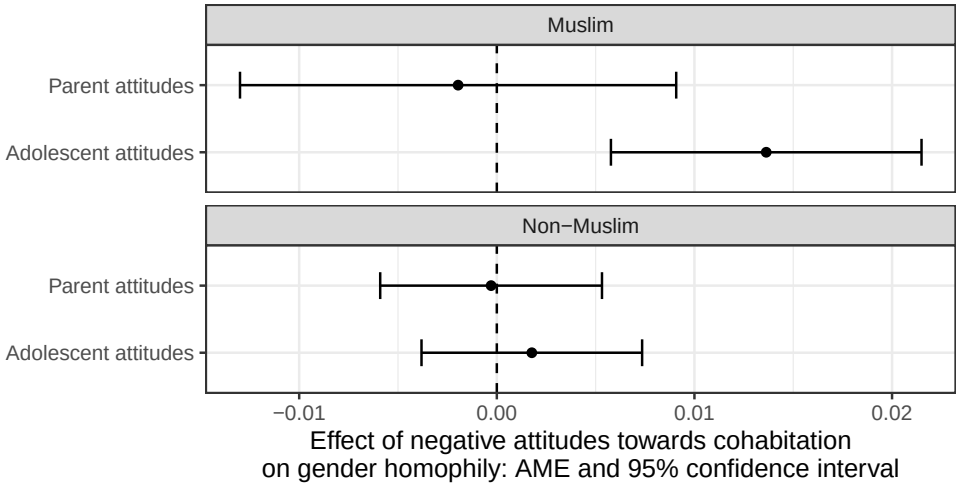
Figure 5.6: Predicted Gender Homophily by Attitudes towards Cohabitation among Muslim and Non-Muslim Youth from Multilevel ERGMs



To illustrate the variation in gender homophily by chastity norms, Figure 5.6 displays predicted homophily at different attitudes towards cohabitation, separately for Muslim and non-Muslim youth. In line with the negligible coefficient for non-Muslims, Figure 5.6 shows that the tendency to make cross-gender friends does not vary with non-Muslim youths' attitudes towards cohabitation. By contrast, Muslim youth with more negative attitudes towards cohabitation have stronger gender homophily. Among Muslim youth who consider cohabitation always OK and thus show no sign of chastity norms, differences compared to non-Muslim youth disappear. However, Muslim youth who consider cohabitation never OK have substantially stronger gender homophily than their non-Muslim peers, with an estimated difference of 3.8 percentage points ($p < .001$). In line with expectations, stronger chastity norms, jointly with their stronger consequences for cross-gender friendships, can thus explain differences in gender homophily between Muslim and non-Muslim youth.

With adolescents' chastity norms explaining much of the gap in cross-gender friendships between Muslim and non-Muslim youth, a strong effect of *parental* norms on top of adolescents' own norms appears less likely. Indeed, Figure 5.7 shows that estimates for variation by adolescents' attitudes towards cohabitation remain largely unchanged when accounting for parental attitudes, while parental attitudes themselves are unrelated to cross-gender friendships among

Figure 5.7: Estimates of Variation in Gender Homophily by Adolescents' and Parents' Attitudes towards Cohabitation among Muslim and Non-Muslim Youth from Multilevel ERGM



both Muslim and non-Muslim youth (see Table D.3 in Appendix D.1 for full model results).[11] Parental norms thus do not appear to be decisive for Muslim youths' in-school cross-gender friendships. The estimates from Figure 5.7 do not mask a gender-specific pattern either: Among both Muslim boys and girls, gender homophily is invariant to parental norms (see Appendix D.2, Figure D.4)

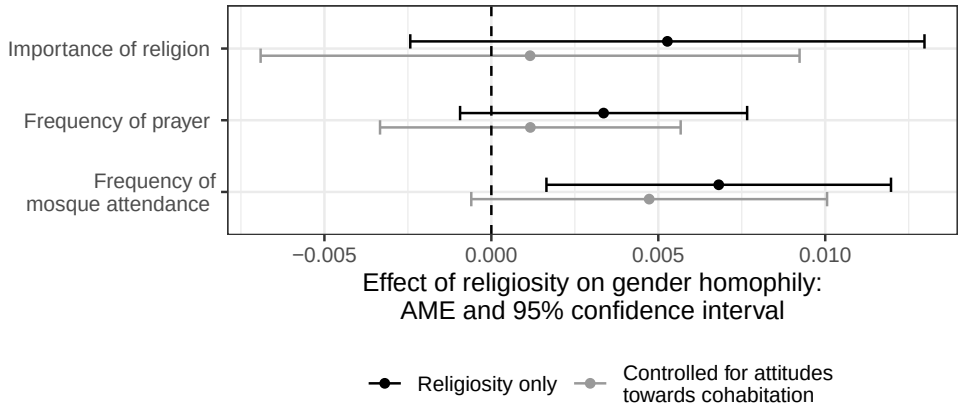
5.4.5 Chastity or Religiosity? The Robustness of Norm Effects

Chastity norms tend to be part of a broader cluster of religious norms. Within this cluster, chastity norms are most clearly connected to cross-gender friendships. Still, it is possible that, rather than chastity norms specifically, religious norms more generally are responsible for the observed variation in gender homophily by attitudes towards cohabitation. To differentiate this, Figure 5.8 assesses variation in gender homophily for different indicators of *religiosity* from the CILS4EU data, which, rather than only chastity norms, track the relevance of religious norms more generally (see Table D.4 in Appendix D.1 for full model results).

Figure 5.8 considers three indicators of religiosity: the subjective importance of religion, the frequency of prayer, and the frequency of mosque attendance. For each indicator, Figure 5.8 shows results from two models: in black, results from a baseline model that only assesses variation in gender homophily by the

[11]This conclusion also holds when considering the possibility that parental norms are only relevant for cross-gender friendships among Muslim youth who themselves hold positive attitudes towards cohabitation, so that adolescents' and their parents' attitudes diverge see Appendix D.2, Figure D.3.

Figure 5.8: Estimates of Variation in Gender Homophily by Religiosity among Muslim Youth from Multilevel ERGM



Note: Estimates rescaled to evaluate all indicators of religiosity on the same scale.

religiosity indicator; and, in grey, results from a model that estimates variation by religiosity when also controlling for attitudes towards cohabitation. In the baseline model, there is a tendency towards stronger gender homophily at higher religiosity for all three indicators, though it is only statistically significant for the frequency of mosque attendance ($p < .01$). However, all coefficients shrink notably when accounting for attitudes towards cohabitation. Once these attitudes are controlled for, coefficients for the frequency of prayer and the subjective importance of religion are close to zero, and the coefficient for the frequency of mosque attendance remains only marginally significant ($p < .1$). By contrast, the coefficient for attitudes towards cohabitation remains largely unchanged and statistically significant in all models (see Table D.4 in Appendix D.1). Accordingly, these results suggest that it is chastity norms rather than religious norms more generally that shape cross-gender friendship-making.

5.5 Discussion

In Western societies, many Muslim youth are confronted at the same time with gender-segregated activities in their religious communities and an everyday life embedded in gender-integrated Western schools. In the context of religious activities, close cross-gender interaction is hardly possible. This is in line with the motivation of gender segregation—avoiding sexual temptation and enforcing chastity norms (Altinyelken 2022; Williams et al. 2017). Opportunities for and expectations on cross-gender interaction are very different in coeducational schools, raising the question of how Muslim youth engage in close cross-gender interaction once the constraints of segregated contexts are lifted.

Past research shows that many Muslim youth continue to hold strong chastity norms (Saharso et al. 2023; Yip & Page 2016), so it is no surprise that they engage less in adolescent dating than their non-Muslim peers, in spite of opportunities to do so (de Graaf et al. 2017; Wong et al. 2017; Yahyaoui et al. 2013). In this chapter, I instead turned to Muslim youths' *cross-gender friendships*, asking whether chastity norms also constrain cross-gender interaction beyond the romantic relationships they target primarily. I focused on friendships in the school context, which provides Muslim youth with ample opportunities for cross-gender interaction, ensuring that the tendency to engage in same- rather than cross-gender friendships reflects an actual decision rather than a mere reproduction of the opportunity structure of gender-separated religious contexts.

Investigating the classroom friendships of Muslim and non-Muslim adolescents in German schools, I found cross-gender friendships to be rare among adolescents in general but even rarer among Muslim than non-Muslim youth. 36% of non-Muslims indicated at least one cross-gender friend, and on average 14% of their friendships crossed gender lines, with negligible differences between Christian and non-religious youth. By contrast, only 29% of Muslim youth nominated at least one cross-gender friend, and only 10% of their friendships crossed gender lines. These differences also persisted in multivariate analyses using multilevel network models.

Among Muslim youth, those with stronger chastity norms were more likely to abstain from cross-gender friendships, while chastity norms were unrelated to cross-gender friendships among non-Muslim youth. Accordingly, Muslim youth who did not ascribe to chastity norms were just as likely to make cross-gender friends as their non-Muslim peers, while Muslim youth with strong chastity norms engaged in cross-gender friendships less frequently. These spillover effects of chastity norms on friendship-making suggest that a substantial proportion of Muslim youth interpret chastity norms to broadly restrict cross-gender interaction rather than to only regulate romantic relationships. By contrast, chastity norms do not interfere with cross-gender friendships among non-Muslim youth. Other than their own chastity norms, the norms of Muslim adolescents' parents were not associated with cross-gender friendship-making in school, apart from indirect links through intergenerational norm transmission. This contrasts with findings from the previous chapter, which—in the context of endogamy rather that chastity norms—suggested an influence of parents even net of adolescents' own norms.

Finally, an unexpected finding was that, though chastity norms were stronger for Muslim girls than for Muslim boys, girls were slightly more open to cross-gender friendships than boys. Muslim girls' cross-gender friendships were also

not constrained by parental chastity norms, though past research suggests that Muslim parents tend to restrict the cross-gender interaction of Muslim girls in particular (Basit 1997a; Hawkey et al. 2018; McGrath & McGarry 2014). This may reflect that in school, where parental and community control is limited, Muslim girls may compensate for the restrictions to cross-gender interaction they face in other contexts. At least in the context of interreligious friendships and endogamy norms, however, the previous chapter suggested that parental influence also persists in the school context.

At the same time, the finding of a greater openness to cross-gender friendships among girls was not specific to Muslim youth but applied to non-Muslims as well. It may therefore represent that, at the same age, adolescent girls generally are more advanced developmentally, and therefore more open to cross-gender interaction (Poulin & Pedersen 2007; Strough & Covatto 2002). Either way, this unexpected finding highlights the importance of studying not only the cross-gender friendships of Muslim girls, as most previous research did, but also those of Muslim boys.

5.5.1 Limitations to Capturing the Role of Chastity Norms

While these findings suggest that chastity norms complicate Muslim youths' cross-gender relations even beyond romantic relationships, some limitations must be acknowledged. To estimate variation in cross-gender frinedships by chastity norms, I had to rely on a measure referring to adolescents' attitudes towards unmarried *cohabitation* rather than towards premarital sex itself. While both types of attitudes have been shown to be closely related (Ogland & Hinojosa 2012), a direct measure of chastity norms would still be preferable.

Usually, the proxy nature of the measure should increase noise and therefore impede finding systematic variation, so the clear association of cross-gender friends with attitudes towards cohabitation among Muslim youth is reassuring. However, one risk associated with the measure is that skeptical attitudes towards cohabitation may not in all cases capture a rejection of premarital sex per se, but particularly of making a sexual relationship *public* through cohabitation. Previous research suggests a logic of "don't ask, don't tell" on premarital sexuality in some Muslim families, where sexual activity may be tacitly tolerated, as long as it is not discussed in public (Saharso et al. 2023). Premarital cohabitation clearly breaks this rule.

Another issue is that, due to gendered chastity norms, Muslims' opposition to premarital sex and cohabitation may depend on whether it is practiced by

girls or boys. An aggregate assessment of attitudes that does not differentiate between the behavior of male and female Muslims necessarily masks this variation.

Finally, a limitation concerning parental attitudes is that only one parent was sampled per adolescent, and this is not necessarily the parent most responsible for the enforcement of chastity norms. For example, some previous studies suggest that it is primarily male family members who regulate children's cross-gender interactions (Hawkey et al. 2018; Saharso et al. 2023), and the majority of parents surveyed were mothers rather than fathers. Accordingly, the measure may suppress some of the influence of parental norms.

In this chapter, I have also suggested that the observed link between chastity norms and cross-gender friendships emerges because chastity norms limit cross-gender friendships. However, it is also possible that cross-gender friendships change sexual attitudes, and an influence like this is conceivable particularly in friendships that entail some romantic interest. While it is not clear why the association between chastity norms and cross-gender friendships should only be observed for *Muslim* youth if friends' influence on sexual attitudes was the main force behind it, it would still be preferable to directly account for this alternative mechanism. Unfortunately, separating both effects requires longitudinal information on both friendship networks and chastity norms, which is not available in the CILS4EU data.

Romantic interest in cross-gender friendships is also relevant beyond friends' potential influence on sexual attitudes. After all, whether cross-gender friendships are platonic or entail romantic interest is likely to affect how adolescents approach these friendships, particularly among Muslims. While Muslim youth with strong chastity norms may consider close cross-gender interaction with romantic interest in conflict with their norms and convictions, this is less likely for platonic friendships (Mir 2009; Maddanu 2016). Due to the different developmental status of same-aged adolescent boys and girls, there is usually an age gap in romantic interest and relationships (Poulin & Pedersen 2007). Therefore, many of the cross-gender friendships observed among classmates will indeed be platonic in nature. Still, to see whether chastity norms primarily constrain cross-gender friendships with a romantic interest or apply to all kinds of cross-gender friendships to a similar degree, it would be desirable to differentiate between these different types of relationships in future studies.

5.5.2 Directions for Future Research

This study suggests two key directions for future research. The first concerns the different contexts in which youth make same- and cross-gender friends.

To ensure opportunities for cross-gender friendships among both Muslim and non-Muslim youth and provide conservative estimates of group differences, I focused on friendships in the *school context* in this study. However, adolescents do not only make friends in school, and fully capturing the extent of and the limitations to cross-gender friendship-making requires going beyond this single context. Considering friendships outside of schools may provide additional insights into the conditions under which parents shape cross-gender interaction, whose norms proved to have little direct influence on the in-school friendships studied here. It may also be instructive to see whether the unexpected greater openness to cross-gender friends among Muslim girls than Muslim boys found in this study persists or reverses in contexts with more outside control. At the same time, opportunity structures, parental and community norms, and adolescents' own values and convictions are more entangled outside of the school context, so separating their impact on cross-gender friendships will be a challenge.

As a second extension, this study suggests an analysis of a broader range of ethno-religious groups. In the German CILS4EU data, samples were too small to differentiate between cross-gender friendship-making beyond Muslim, Christian, and non-religious youth. However, investigating other ethno-religious minorities is essential to determine whether stronger gender segregation, relative to Christian and non-religious youth, is specific to Muslim adolescents or concerns ethno-religious minorities more broadly. While the tendency to enforce chastity norms through gender separation has traditionally been strong in Muslim communities, this may not be the only reason for the association of chastity norms and cross-gender friendships. Instead, broad restrictions to cross-gender interaction may also be a reaction to the ubiquitous display of sexuality and permissive sexual attitudes among secular Westerners, which are not only a concern among Muslims but in various religious groups (Beekers & Schrijvers 2020; Cense 2014). In this cultural climate, restricting close cross-gender interaction may be a strategy that minorities rely on to distance themselves from a sexual culture they reject. Past research has documented such reactions primarily among parents (Le Espiritu 2001), but at least in principle, they may also apply to adolescents. If these processes are responsible for the link between chastity norms and cross-gender friendships among Muslim youth, patterns may be similar for other religious groups. Investigating other ethno-religious minorities thus will not only provide a broader perspective on gender segregation but also on the mechanisms linking chastity norms to cross-gender friendships.

Independent of the exact processes responsible for the predominance of same-gender friendships among Muslim youth, the resulting gender segregation is likely to have practical consequences. Cross-gender friendships fulfill a variety

of developmental functions in adolescence, providing cross-gender experiences and perspective-taking necessary to engage in fulfilling romantic relationships and successfully cooperate in the gender-integrated spheres of adult life that characterize Western societies (McDougall & Hymel 2007; Mehta & Strough 2009; Poulin & Pedersen 2007). However, next to these general benefits, cross-gender friendships may also be of distinct importance for Muslim youth. In many Muslim communities, a diversity of egalitarian and traditional gender ideologies increasingly supersedes conservative interpretations of gender roles that were prevalent among first-generation immigrants (Glas 2023; Röder & Mühlau 2014). The roles ascribed to men and women are thus in a process of reassessment and renegotiation, and cross-gender friendships, along with the skills and perspectives they provide, can reduce friction in this process. As controversies between Muslims and Western non-Muslims also often surround issues of gender and gender equality (Choi et al. 2023; Sniderman & Hagendoorn 2009), cross-gender friendships may at the same time hold the potential to improve interreligious relations and the cultural integration of Muslims into Western societies. By contrast, the gender stereotypes that can persist in same-gender friendship circles can further complicate both the renegotiation of gender relations within Muslim communities and relations with non-Muslims. Chastity norms thus restrict Muslim adolescents' cross-gender friendships at a point in time when the close and respectful cross-gender interaction they come with may be particularly beneficial, an issue the next chapter explores in more detail.

Chapter 6

The Influence of Cross-Gender Friends on Muslim Youths' Gender Role Attitudes

A different version of this chapter is in preparation for submission to an international, peer-reviewed journal.

Abstract

In Chapter 5, we have seen that Muslim youth have fewer cross-gender friendships than their non-Muslim peers. In this chapter, I ask what consequences this lack of cross-gender friendship-making has for the gender role attitudes of Muslim youth. In the face of Western societies' increasing emphasis on gender equality, the more traditional gender role attitudes Muslims tend to hold have become a source of cultural conflict. Accordingly, if a lack of cross-gender friendships allows more traditional gender role attitudes to persist, Muslim youths' limited cross-gender friendship-making has important implications for their cultural integration into Western societies. Claims that same-gender friends reinforce traditional gender role attitudes and cross-gender friendships support the development of more egalitarian attitudes have repeatedly surfaced in past research. However, these claims have not yet been submitted to rigorous empirical testing, neither for the Western non-Muslim majority nor for Muslim minority youth.

I provide this empirical test by applying stochastic actor-oriented models for the coevolution of friendships networks and gender role attitudes to two waves of large-scale network survey data on Muslim and non-Muslim youth in Germany. I find that boys with cross-gender friends develop more egalitarian attitudes over time, and that this influence is strongest for Muslim boys. By contrast, Muslim and non-Muslim girls' gender role attitudes are independent of cross-gender friendship-making. These findings highlight that a lack of cross-gender friendships can hamper cultural integration into Western societies in terms of gender role attitudes, particularly for Muslim boys. This observation is further substantiated by counterfactual simulations, which show a notable shift towards more egalitarian gender role attitudes among Muslim boys in reaction to a greater proportion of cross-gender peers in their friendship network.

6.1 Introduction

In the previous chapter, I have shown that Muslim youth less frequently have cross-gender friends than their non-Muslim peers. I have also hinted at the implications this gender segregation may have for both their cultural integration into Western societies and for the negotiation of gender roles in Muslim communities. In this chapter, I go beyond mere conjecture and provide empirical evidence on the consequences of gender segregation. To that end, I investigate how cross-gender friendships affect Muslim adolescents' *gender role attitudes*—the different roles they ascribe to men and women (Davis & Greenstein 2009; Halimi et al. 2016).

More so than the Western majority, Muslims tend to hold traditional gender role attitudes (Diehl et al. 2009; Röder & Mühlau 2014), a pattern that also persists among young Muslims born and raised in the West (Kretschmer 2018; la Roi & Mood 2022). Past research shows that more traditional parental attitudes and religious socialization are partially responsible for this difference, but these factors cannot explain it fully (Diehl et al. 2009; Kretschmer 2018; Röder & Mühlau 2014). At the same time, previous research has highlighted the potential of cross-gender friendships to shift attitudes in a more egalitarian direction (e.g., McHale et al. 2004; Sippola 1999), and this influence may be particularly strong in adolescence, a period in which friends are key to the development of gender-related attitudes (Kågesten et al. 2016; Witt 2000). Therefore, a lack of cross-gender friendships is an underexplored factor that may contribute to young Muslims' more traditional attitudes.

Diverging gender role attitudes have become a source of conflict between Muslims and non-Muslims in the West (Choi et al. 2023; Sniderman & Hagendoorn 2009). Only a few decades ago, traditional attitudes, which ascribe childcare and household duties to women and the breadwinner role to men, predominated in many Western societies. By now, however, attitudes have become more egalitarian, stressing the shared responsibility of men and women for both domestic and paid work (Davis & Greenstein 2009; Röhr-Sendlmeier et al. 2018; Grunow et al. 2018). Though gender role attitudes remain more traditional among Western Muslims (Diehl et al. 2009; Röder & Mühlau 2014), attitudes in Muslim communities are changing as well, as the traditional gender ideology of many first-generation immigrants is replaced by a greater diversity of egalitarian and conservative attitudes (Maliepaard & Alba 2016; Röder 2014). Understanding the development of Muslim youths' gender role attitudes is thus relevant for understanding relations both within Muslim communities and between Muslims and non-Muslims.

Gender role attitudes remain malleable in childhood and adolescence but

tend to stabilize in adulthood (Kågesten et al. 2016; Lendon & Silverstein 2012). Much previous research has therefore focused on the development of gender role attitudes among children and adolescents and on parental influence specifically. Unequivocally, this literature finds egalitarian parents to usually have egalitarian children, while traditional parents have more traditional children (for reviews, see Davis & Greenstein 2009; Halimi et al. 2016). Intergenerational transmission tends to thus reproduce attitudes across generations, contributing to the persistence of more traditional attitudes among Muslims (Idema & Phalet 2007; Kretschmer 2018).

While parents are the prime social influence on gender role attitudes in childhood, *friends* become increasingly influential when children grow older and enter adolescence (Halimi et al. 2016; Witt 2000). Friends' influence on gender role attitudes is particularly relevant because, other than parents, friends do not necessarily promote continuity in attitudes, but can also be drivers of change. Potential for change in gender role attitudes has been seen in *cross-gender friends* in particular (McHale et al. 2004; Sippola 1999). While gender-segregated friendship circles tend to reinforce gender stereotypes and gendered ascriptions of social roles, cross-gender friendships may provide opportunities to revise stereotypes and rethink gender role attitudes (Marmion & Lundberg-Love 2004; McHale et al. 2004).

However, empirical research on cross-gender friends' influence on gender role attitudes is lacking. The few previous studies investigating the association between cross-gender friends and gender role attitudes could not distinguish whether an actual influence of cross-gender friends or other processes are responsible for the association, as most authors readily acknowledge (Bryant 2003; Halimi et al. 2021; McHale et al. 2004; Perez-Brena et al. 2015). No studies have thus far investigated the link between cross-gender friends and the gender role attitudes of Western Muslim youth either.

Given the dearth of previous research, I approach the question of cross-gender friends' influence on Muslim youths' gender role attitudes in a series of consecutive steps. First, I establish the mechanisms than can underlie cross-gender friends' influence on gender role attitudes *in general*. I also discuss why the influence of cross-gender friends is likely to be stronger for boys than girls. As traditional attitudes have widely different implications for boys and girls, neglecting a gender-specific perspective on the development of gender role attitudes is misleading (Bolzendahl & Myers 2004). Having established general and gender-specific mechanisms of influence, I then turn to the specific question of cross-gender friends' influence among *Muslim youth*. Considering the role of Islamic religiosity and the mixed signals Muslim youth receive on appropriate gender roles in Western societies (Ng 2022a; Velayati 2016), I assess why the

influence of cross-gender friends may differ between Muslim and non-Muslim adolescents.

Based on these considerations, I apply longitudinal social network models to data on the friendships and gender role attitudes of more than 3,000 youth in German schools from the CILS4EU survey (Kalter et al. 2019). I separately estimate the influence of cross-gender friends on gender role attitudes for boys and girls, as well as Muslim and non-Muslim youth. Going beyond previous research, I simultaneously account for whether gender role attitudes shape adolescents' tendency to select same- and cross-gender friends. As this process of attitude-based friendship selection can also be responsible for an association of cross-gender friends and gender role attitudes, controlling for it is essential to estimate cross-gender friends' actual *influence*.

In the analysis, I find that both Muslim and non-Muslim boys with cross-gender friends adopt more egalitarian gender role attitudes over time, while Muslim and non-Muslim girls' attitudes do not react to cross-gender friendships. The influence of cross-gender friends is particularly strong among *Muslim boys*. Their limited cross-gender friendships, as documented in the previous chapter, thus constrain their development of more egalitarian attitudes and, in turn, their cultural integration into Western societies.

6.2 Theory

To understand how cross-gender friends can influence the gender role attitudes of Muslim youth and how this may differ from the influence non-Muslim Westerners experience, it is necessary to first understand the general mechanisms that can underlie cross-gender friends' influence. At the most general level, theories on the development of gender role attitudes suggest that *exposure* to situations and ideas that resonate with egalitarian ideals are essential for the development of egalitarian attitudes; by contrast, exposure to traditional ideas and situations promotes traditional attitudes (Bolzendahl & Myers 2004; Davis & Greenstein 2009). While the prime sources of such exposure in childhood are parents' gender-related activities and ideas, other sources of influence become more important as children grow older (Bussey & Bandura 1999; Davis & Greenstein 2009). In adolescence, youth increasingly spend time with their friends and therefore also become exposed to friends' conceptions of gender role attitudes through friends' behavior and by discussing gender-related issues (Bussey & Bandura 1999).

For the development of gender role attitudes, *cross-gender friends* are of special importance, as gender role attitudes concern relations between the genders,

which cross-gender friendships can provide perspectives and information on (Sippola 1999). The influence of cross-gender friends on gender role attitudes can work through two main mechanisms, which are discussed in more detail below: On the one hand, as boys and girls tend to hold different gender role attitudes, cross-gender friends may shift gender role attitudes as adolescents *adapt to their cross-gender friends' attitudes*. On the other hand, cross-gender friendships can reduce *gender stereotypes*. Gender stereotypes, in turn, are linked to traditional gender role attitudes, meaning a change in stereotypes can also change gender role attitudes.

6.2.1 Adaptation to Cross-Gender Friends' Gender Role Attitudes

In general, adolescents are highly susceptible to peer influence, adapting to friends' attitudes and behavior in a wide range of domains (Brechwald & Prinstein 2011). Recent findings also show that adolescents adapt to the gender role attitudes prevailing in the larger school peer group (Halimi et al. 2020; Sánchez Guerrero & Schober 2021), though studies that specifically identify the influence of friends are currently missing.

Two main processes can drive the adaptation to cross-gender friends' attitudes. The first is *an exchange of ideas and opinions* (Bussey & Bandura 1999; Jenkins et al. 2023). For instance, mismatched gender role attitudes among cross-gender friends can spark discussions on the reasons for diverging opinions and a revision of attitudes if these reasons are convincing. Alternatively, even without explicit discussion, adolescents learn about their cross-gender friends' diverging attitudes through friends' behavior (Bussey & Bandura 1999; Davis & Greenstein 2009). This more subtle exposure can also lead to a reevaluation of gender role attitudes and an assimilation of cross-gender friends' attitudes.

A second source of adaptation is *peer pressure* (Bussey & Bandura 1999; Cook et al. 2019; Halimi et al. 2021). In exclusively same-gender friendship circles, youth risk being rejected if they stand out in terms of gender-related characteristics, so pressure to conform to same-gender friends' gender role attitudes is strong (Keener et al. 2013; Maccoby 1998; McHale et al. 2004). Cross-gender friends can to some degree alleviate this pressure from same-gender friends, opening up broader ranges of acceptable attitudes (Halimi et al. 2021). At the same time, cross-gender friends can become a source of peer pressure themselves, urging friends to adapt to their attitudes.

The gender role attitudes of boys and girls tend to differ, as, on average, girls hold more egalitarian gender role attitudes than boys (see Halimi et al. 2016, for a review). Accordingly, an adaptation to cross-gender friends' attitudes through an exchange of ideas or through peer pressure is likely to *change* adolescents'

attitudes. Boys, who tend to hold more traditional attitudes, are likely to move towards their female friends' more egalitarian attitudes. Conversely, girls may shift towards their male friends' more traditional attitudes, though this latter effect is less likely, as I will discuss in more detail later.

6.2.2 Changes in Gender Stereotypes

In addition to adaptation of attitudes, exposure to cross-gender friends can also have an impact on gender role attitudes by dispelling *gender stereotypes*. Gender stereotypes are overgeneralized ascriptions of characteristics to men and women (Ellemers 2018; Kite et al. 2008). For example, women are expected to be warmer and more caring about others than men, and men are expected to be more assertive and competent than women (e.g. Ellemers 2018; Hentschel et al. 2019; Prentice & Carranza 2002). Gender stereotypes, in turn, legitimize traditional gender role attitudes: Stereotyped as warmer and more caring, women are considered better suited for raising children; stereotyped as more assertive and competent, men are considered more suited for the breadwinner role (Croft et al. 2015; Eagly & Mladinic 1994; Ellemers 2018).

Gender stereotypes exaggerate differences between men and women and underestimate variation within each gender group (Ellemers 2018; Kite et al. 2008). Dismantling these stereotypes is facilitated by disproving evidence (Hilton & von Hippel 1996; Sippola 1999). Therefore, stereotypes about the other gender are more likely to change in mixed-gender friendship circles, where disproving evidence can be provided, compared to same-gender friendship circles that offer less information about the other gender (Karpiak et al. 2007; Maccoby 1998; Sippola 1999). In fact, *friendships* may be among the cross-gender interactions most suited to dispel gender stereotypes. Other cross-gender interactions, such as those taking place in the family or workplace context, are frequently characterized by status differences, which inhibit a reassessment of gender stereotypes (Ridgeway & Correll 2004; Ridgeway & Smith-Lovin 1999). By contrast, social and occupational roles are not yet clearly differentiated in adolescent cross-gender friendships, and status differences are minor, facilitating the revision of gender stereotypes.[1] As gender stereotypes justify traditional gender role attitudes (Croft et al. 2015; Eagly & Mladinic 1994; Ellemers 2018), a revision of stereotypes in cross-gender friendships may induce more egalitarian attitudes.

[1]This line of argument is very similar to *contact-theoretical* considerations on how intergroup contact can change prejudice, stereotypes, and *intergroup attitudes* (Allport 1954; Pettigrew & Tropp 2006). However, because contact theory is concerned with intergroup attitudes rather than with the *roles ascribed to out-group members*, it is usually not applied to the study of influence on gender role attitudes, despite the overlap of underlying mechanisms (such as the reduction of stereotypes; Pettigrew & Tropp 2008).

6.2.3 Differences in the Influence of Cross-Gender Friends between Boys and Girls

Before considering how cross-gender friends influence Muslim youths' gender role attitudes specifically, another key differentiation requires elaboration: the differentiation by *gender*. Though, in principle, the influence mechanisms discussed above apply to both genders, boys' and girls' *susceptibility* to influence is likely to differ. As mentioned above, girls and women hold more egalitarian attitudes than boys and men (for reviews, see Davis & Greenstein 2009; Halimi et al. 2020), and this gender difference mainly originates from gender variations in the level of interest in egalitarianism (Bolzendahl & Myers 2004; Davis & Greenstein 2009). Traditional gender role attitudes exclude women from activities that bring both high status and material security, particularly from the participation in the labor market in higher-level jobs that require full-time commitment. At the same time, traditional attitudes push women towards activities (such as child-rearing or housework) that come with less status and security (Croft et al. 2015; Lois 2020). Accordingly, the material and status benefits that women accrue from egalitarian ideals are straightforward. By contrast, men's interest in egalitarianism tends to not be as clear-cut. While egalitarianism alleviates pressure on men's labor market performance and allows them greater involvement in the family (Croft et al. 2015), it also confronts men with additional housework and childcare responsibilities (Davis & Greenstein 2009). While the balance of these considerations still results in many men supporting gender egalitarianism, support continues to be less unequivocal than among women (Davis & Greenstein 2009; Halimi et al. 2016).

This gender-specific interest in gender egalitarianism may also affect how susceptible boys and girls are to the *influence* others can exert on their gender role attitudes. Given the material and status advantages egalitarian gender roles hold for women, many girls strongly embrace egalitarianism and reject traditional attitudes. Under these conditions, an interaction with more traditional cross-gender friends is unlikely to convince them of more traditional attitudes. Similarly, the fact that traditional girls forgo these benefits by embracing more traditional roles suggests strong counterbalancing traditional convictions. Given these hardened convictions, traditional girls are also likely to resist outside influence on their attitudes. This is different for boys, whose benefits (and costs) from egalitarianism are both more ambiguous and lower than those of girls. Due to these lower stakes, boys are likely to be more open to changing their gender role attitudes. For the same reason, they may less consciously decide on their attitudes and therefore more readily revise them in reaction to outside influence. Adaptation to cross-gender friends' gender role attitudes is therefore

likely to be asymmetrical: While boys may assimilate girls' more egalitarian gender role attitudes in cross-gender friendships, it is less likely that girls adapt to the more traditional gender role attitudes of their male friends.

Cross-gender stereotypes, however, prevail among both genders (Ellemers 2018; Hentschel et al. 2019). Among both boys and girls, they may thus diminish due to counter-stereotypical experiences in cross-gender friendships. This does not necessarily have the same *consequences* on gender role attitudes for both genders, though. Despite their stereotypes, many girls embrace highly egalitarian gender role attitudes, meaning that a further change in attitudes due to diminishing gender stereotypes is hardy possible. This is different among boys, who tend to hold more traditional attitudes, so that changes in stereotypes are more likely to lead to changes in gender role attitudes.

In line with these expectations on a gender-specific influence, a study by Bryant (2003) found more egalitarian gender role attitudes among young men with cross-gender friends and no variation in attitudes according to women's cross-gender friendships. However, other studies found different patterns. McHale et al. (2004) found no variation in gender role attitudes according to the time adolescent boys and girls spend with cross-gender peers; Halimi et al. (2021) documented more traditional gender role attitudes for girls with cross-gender friends but no variation for boys; and Perez-Brena et al. (2015) found more egalitarian attitudes among boys who spend more time with cross-gender friends but more traditional attitudes among girls. However, as the authors acknowledge themselves, these studies only demonstrate an *association* between cross-gender friends and gender role attitudes, but they cannot separate cross-gender friends' *influence* from other processes that may induce this association. Furthermore, none of them consider the conditions of cross-gender friends' (gendered) influence among *Muslim youth*.

6.2.4 Differences in the Influence of Cross-Gender Friends between Muslim and Non-Muslim Youth

Having established general and gender-specific expectations for the influence of cross-gender friends, it now is possible to consider the specifics of influence among *Muslim youth*. Differences in the influence of cross-gender friends between Muslim and non-Muslim youth are much less clear than gender differences, as there are both arguments supporting *stronger* and *weaker* influence among Muslim compared to non-Muslim youth.

On the one hand, past research has frequently attributed Western Muslims' more traditional gender role attitudes to Islamic religiosity (e.g. Diehl et al. 2009; Röder & Mühlau 2014). In particular, dominant interpretations of the

Qur'an have been suggested to support a traditional division of labor between men and women by idealizing women's roles as mothers and the men's role as family providers (Glas 2023; Velayati 2016). However, this religious foundation may not only result in more traditional attitudes, but it may also limit religious Muslim youths' openness of attitudes to outside influence. Because of a religious justification, Muslim youth may consider changing (traditional) gender role attitudes in contradiction with religious norms (Giuliani et al. 2017) and may thus be less susceptible to the influence of cross-gender friends.

On the other hand, recent findings question the link between Islamic religiosity and gender role attitudes. Research on Muslims born and raised in the West suggests that, while their attitudes tend to remain more traditional than those of non-Muslims, they no longer vary substantially by religiosity (Beek & Fleischmann 2020; Glas 2023; Scheible & Fleischmann 2013). This finding also suggests that religiosity is unlikely to continue to dampen the influence of cross-gender friends on gender role attitudes.

At the same time, the mixed signals Western Muslim youth tend to receive on gender role attitudes may also affect their susceptibility to friends' influence. In many Western institutions, Muslim youth experience a dominance of egalitarian norms and behavior, while a more traditional division of labor frequently characterizes the family and religious context (Norris & Inglehart 2012; Velayati 2016). On the one hand, Muslim youths' reliance on friends as role models may be strong due to the uncertainty these mixed signals cause, suggesting a strong influence of friends on gender role attitudes. On the other hand, if friends' expectations' conflict with those from the religious and family context, this may buffer friends' influence. Depending on which of the effects dominates, Muslim or non-Muslim youth may be more prone to outside influence.

Finally, there also are conflicting expectations on the specific influence that *cross-gender friends* have on Muslim youths' gender role attitudes. As discussed in the previous chapter, close cross-gender relations are comparably rare outside of the family context in many Muslim communities (Altinyelken 2022; Velayati 2016; Williams et al. 2017). More so than among non-Muslim youth, having (mostly school-based) cross-gender friends may therefore determine whether Muslim youth get insights into the other gender's perspective from equal-status peers or not. Both for an adaptation of gender role attitudes and a revision of gender stereotypes, cross-gender friends may thus be more important for Muslim than non-Muslim youth. At the same time, there is a risk that, in the absence of other close cross-gender interaction partners, Muslim youth discount initial experiences with cross-gender friends rather than revise gender stereotypes and gender role attitudes. Indeed, the literature on stereotyping suggests that stereotypes do not necessarily diminish gradually, but they can

also change discontinuously once enough counter-stereotypical information has accumulated in the long term (Hewstone et al. 1992; Hilton & von Hippel 1996).

6.2.5 Summary and Expectations on Influence Effects

Summing up, cross-gender friends are likely to shift the gender role attitudes of *boys* in a more egalitarian direction, while cross-gender friends' influence is likely to be lower—and may even be negligible—among *girls*. Influence of cross-gender friends is likely to also affect *Muslim* youth, and again, influence is expected to be stronger among Muslim boys than Muslim girls. Whether the influence of cross-gender friends is stronger among Muslim youth or non-Muslim youth is, however, not clear. Identifying the strength of this cross-gender influence among Muslim youth is essential to gauging the extent to which a lack of cross-gender friendships blocks the adoption of more egalitarian attitudes among Muslim youth, and boys specifically.

6.2.6 A Threat to Determining Influence Effects: The Selection of Cross-Gender Friends based on Gender Role Attitudes

The focus of this chapter lies in exploring the *influence* cross-gender friends have on gender role attitudes. However, an empirical link between cross-gender friendships and gender role attitudes can emerge not only from influence but a second process: the *selection* of cross- vs. same-gender friends depending on gender role attitudes. Though not this study's substantive focus, accounting for selection processes in the empirical analysis is essential to ensure that cross-gender influence is not confused with selection.

A selection of cross-gender friends based on gender role attitudes can occur for various reasons. For example, boys with more traditional gender role attitudes may shun cross-gender friendships, because they fear or experience incompatibilities in the interaction with girls, who tend to be more egalitarian. Similarly, traditional girls may avoid friendships with boys, because they believe in inherent gender differences that complicate cross-gender friendships. Alternatively, it may also be egalitarian girls who, opposed to boys' greater traditionalism, avoid cross-gender friendships that may come with value conflict.

Independent of the specifics and strength of these selection processes, accounting for them in the empirical analysis is essential to avert the risk of obtaining inaccurate estimates of influence effects in the face of selection. None of the few previous studies on the link between cross-gender friendships and gender role attitudes (Bryant 2003; Halimi et al. 2021; McHale et al. 2004; Perez-Brena et al. 2015) could separate selection from influence effects, which may

be one reason for their inconsistent findings. In this chapter, I address this limitation with longitudinal network models that can model selection and influence effects simultaneously (Steglich et al. 2010; Ripley et al. 2023). Next to the assessment of cross-gender friends' influence among Muslim youth, this study thus goes beyond previous research by providing selection-adjusted estimates of cross-gender friends' influence on gender role attitudes.

6.3 Data and Methods

6.3.1 Data

I investigate the link between cross-gender friends and gender role attitudes with German data from the first two waves of the *Children of Immigrants Longitudinal Survey in Four European Countries* (CILS4EU; Kalter et al. 2016a,b, 2019). CILS4EU data collection was based on a random sample of schools, oversampling schools with a high proportion of ethnic minority students. The first wave of data was collected in 2010 and 2011; the second wave followed the next year. Within schools, all students from two randomly selected ninth-grade classrooms were surveyed. In the first wave, students were 14-15 years old on average; in the second wave, they were 15-16 years old.

In both waves, the student survey contained a sociometric questionnaire that provides information on students' friendships with their classmates. In total, 5,013 students from 271 classrooms participated in the first wave. Like in Chapter 2, I excluded classrooms in which classroom network data was missing in the second wave or student non-response was more than 50% in at least one of the waves. Applying these restrictions, the same 3,194 students from 149 classrooms as in Chapter 2 remain in the analytical sample. In Appendix E.1, I show that gender role attitudes, cross-gender friendships, and the link between both are very similar in the full and analytical sample (selectivity of this sample more generally has been discussed in detail in Appendix A.1).

6.3.2 Variables

Friendship networks. To capture adolescents' friendship network, I use information from the sociometric questionnaire. From a list of all students in their classroom, students could nominate up to five best friends. Because all students within a classroom were surveyed, individual-level information on all adolescents as well as their friends is available, including their gender and gender role attitudes.

Gender role attitudes. To measure gender role attitudes, I use four items on the preferred *division of labor* between men and women in a family. Respondents were asked "In a family, who should do the following?" for four tasks: taking care of children, cooking, cleaning, and earning money. For each task, respondents could indicate whether the task should be done "mostly by the woman", "mostly by the man", or shared between both partners ("both about the same"). For childcare, cooking, and cleaning, I classified attitudes as traditional if students primarily allocated the task to the woman, and as egalitarian when they indicated otherwise.[2] For earning money, I classified attitudes as traditional if respondents primarily allocated the task to the man, and as egalitarian when they indicated otherwise. As a measure of egalitarian gender role attitudes, I use the *number of egalitarian answers*, which ranges from 0 to 4. The internal consistency of the scale is acceptable with a Cronbach's α of 0.69, and a principal component analysis also suggests a single-component solution. This operationalization of gender role attitudes corresponds to that of previous studies using the CILS4EU data (e.g., Kretschmer 2018; Kroneberg et al. 2021; la Roi & Mood 2022; Sánchez Guerrero & Schober 2021).

Gender. I rely on students' self-reported gender (male or female). Information on gender is complete; 51% of the students identified as female.

Muslim and Non-Muslim youth. Students indicated their religious affiliation by selecting from a list of the most frequent affiliations or by providing an open-ended answer. I differentiate between students who identify as *Muslim* (24% of the sample) and *non-Muslim* (76% of the sample). Non-Muslims are primarily Christian (77%) or non-religious (18%), with only a small minority belonging to a different religious group (5%). In the main analyses, I only differentiate between Muslim and non-Muslim youth, but Appendix E.2 shows that the link between gender role attitudes and cross-gender friendships is very similar when further differentiating between Christian and non-religious youth.

Religiosity. I use information on the frequency of prayer to capture students' religiosity. Frequency of prayer was assessed on a 6-point scale, with students indicating that they pray "never" (0), "less than once a month" (1), "less than once a week" (2), "once a week or more", (3) "every day" (4), or "at least five times a day" (5).

Ethnic Background and Socioeconomic Status. I capture ethnic background with data on the country of birth of students, their parents, and their grandparents. Students are considered to have German origin if they, their parents, and their grandparents are born in Germany. Otherwise, I assign their ancestors'

[2]This also classifies cases as egalitarian in which respondents indicated that the task should primarily be done by the man. The proportion of answers in this category was negligible, though.

country of birth, following standard procedures for the CILS4EU survey (Dollmann et al. 2014). To capture socioeconomic status, I rely on information on parents' occupational status measured on the ISEI scale. If available, I use data from the parental CILS4EU survey; otherwise, I use information provided by the adolescent respondent. I use the higher of both parents' occupational status to measure socioeconomic status.

Missing values. For all variables apart from gender role attitudes, I substitute missing information by corresponding data from the second and third wave of the CILS4EU survey if available.

6.3.3 Method: Stochastic Actor-Oriented Models

To investigate the influence of cross-gender friendships on Muslim and non-Muslim youths' gender role attitudes, I rely on *stochastic actor-oriented models* (SAOM) for the coevolution of friendship networks and gender role attitudes (Snijders et al. 2010). These SAOMs simultaneously model the evolution of friendship networks and gender role attitudes over time, while those estimated in Chapter 2-3 only considered the evolution of friendship networks. SAOMs require empirically observed friendship networks and gender role attitudes at (at least) two points in time. By means of agent-based simulation, SAOMs decompose the change in networks and attitudes observed between the two points in time into single changes in friendship ties and attitudes by individual students. These changes are modelled in so-called micro steps. In a network micro step, a (randomly selected) student can form a friendship tie, remove a tie, or leave the network unchanged. In an attitude micro step, a (randomly selected) student can increase the number of gender-egalitarian attitudes by one, decrease it by one, or leave attitudes unchanged.

These changes depend on behavioral tendencies for network and attitude development that are specified in the SAOM model specification, as well as the coefficients associated with these tendencies. Behavioral tendencies can represent various processes expected to be relevant for friendship-making and attitude development. Of highest substantive interest in this chapter is cross-gender friends' *influence*—the tendency to change gender role attitudes in reaction to cross-gender friendships. Modeling cross-gender friend *selection*, the tendency for cross-gender friendships to evolve or dissolve for students with more or less egalitarian attitudes, is also essential to ensure that influence effects are estimated net of selection effects. Next to selection of and influence based on cross-gender friends, I also include a variety of other behavioral tendencies to accurately capture the evolution of friendship networks and gender role attitudes over time, as discussed in more detail below.

Multilevel Random-Coefficients SAOM Analysis

To estimate the evolution of friendship networks and gender role attitudes across the 149 friendship networks in the sample, I rely on *random-coefficients multilevel SAOMs*, like in Chapter 2. Multilevel SAOMs estimate joint effects across all networks, so complex SAOMs can be estimated though each classroom network itself is small (Ripley et al. 2023). Using random effects, variation in coefficients at the network level can be modelled as well. In all estimated models, I treat endogenous network effects as well as the effects of control variable as random effects. I treat all effects that relate to gender role attitudes, the key theoretical interest in this chapter, as fixed effects to ensure sufficient precision in these estimates. This is line with other applications of multilevel random-coefficients SAOMs in the literature (e.g. Boda 2018; Raabe et al. 2019). Multilevel random-coefficients SAOMs rely on a Bayesian estimation technique that models sequences of student-level changes in the friendship network and gender role attitudes between observation periods, implemented in the *multiSiena* package (Version 1-3.31) in R. SAOMs impute missing data internally with plausible values, ensuring that the impact of missing values on parameter estimation is minimized (Ripley et al. 2023). All models reported below converge according to standard convergence criteria for multilevel random-coefficients SAOMs (Ripley et al. 2023). In Appendix A.3 of Chapter 2, I have provided a detailed discussion of the technical specificities of multilevel random-coefficients SAOMs, the choice of priors for Bayesian estimation, and convergence assessment. All these considerations also hold for the models estimated in this chapter.

Model Specification: The Evolution of Gender Role Attitudes

In terms of the evolution of gender role attitudes, my greatest substantive interest is in whether and how cross-gender friends induce change in gender role attitudes over time. To capture the influence of cross-gender friends, I model how the evolution of gender role attitudes varies with the proportion of cross-gender friends. I model influence separately for boys and girls as well as for Muslim and non-Muslim youth, each with a group-specific *avXalt* effect.

To capture the general intertemporal trend in gender role attitudes, I also include a *linear* and a *quadratic shape* effect. In addition, I account for variation in the evolution of gender role attitudes between boys and girls (*from girl* effect), between Muslim and non-Muslim youth (*from Muslim* effect), and for the interaction of both. In addition, I also model how the evolution of gender role attitudes varies by religiosity (*from religiosity* effect) and socio-economic status (*from ISEI* effect).

Model Specification: The Evolution of Friendship Networks

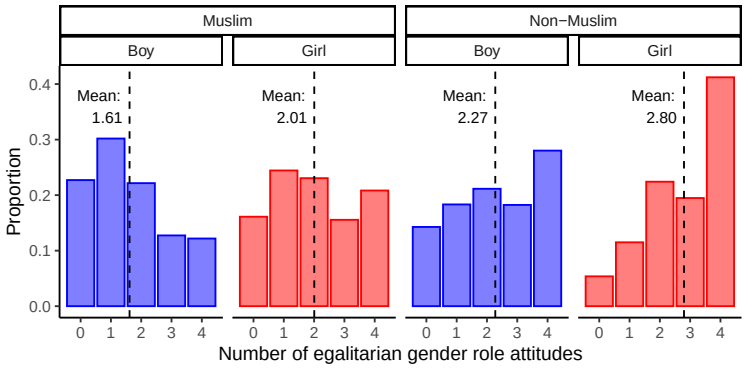
In this chapter, the most important function of modelling the evolution of friendship networks over time is to control for whether students' tendency to make same- or cross-gender friends depends on their gender role attitudes. If not controlled for, selection effects can result in biased estimates of the influence of cross-gender friends on gender role attitudes. I capture the tendency of boys and girls to make same- or cross-gender friends with three effects, the *Girl ego, Girl alter*, and *Girl ego* $\times$ *Girl alter effects*. Jointly, these map the selection of same- and cross-gender friends and its variation between boys and girls (see Appendix E.3 for a derivation). To capture how selection differs by gender role attitudes, I interact these effects with the *Gender role attitudes ego* effect. To capture variation in selection between Muslim and non-Muslim youth, I further interact all effects with the *Muslim ego* effect.

To accurately depict the evolution of friendship networks according to other characteristics, I additionally model selection of friends with the same religious group, the same ethnic background, similar socioeconomic status, and similar religiosity. I also account for a set of network-related processes well-known to shape the evolution of friendship networks to capture network dynamics accurately (Ripley et al. 2023). This includes the tendency to reciprocate friendships (*reciprocity* effect), the tendency to become friends with one's friends (*transitive triplets* effect), and the interaction of both (*transitive reciprocated triplets* effect). I also model dispersion in the number of friendships sent and received, as well as the correlation of both with the *outdegree-activity, indegree-popularity*, and *indegree-activity* effects, and consider the overall density of the friendship networks with the *outdegree* effect.

6.3.4 Simulations Based on SAOM Results

The estimates from SAOMs are multinomial logit coefficients and thus hard to interpret substantively beyond their sign and statistical significance. To provide a more intuitive assessment of the size of effects, I complement the SAOM results with a simulation analysis. For the simulation, I combine the friendship networks and gender role attitudes observed in the first wave of data with the SAOM estimates to generate simulations of the distribution of gender role attitudes in the second wave. In one set of simulations, I use the exact estimates from the SAOM model; in a second set, I set all estimates for cross-gender friends' influence on gender role attitudes to zero. A comparison of the attitudes predicted in both simulations thus shows how cross-gender friends contribute to the evolution of gender role attitudes.

Figure 6.1: Distribution of Gender Role Attitudes among Muslim and Non-Muslim Youth by Gender



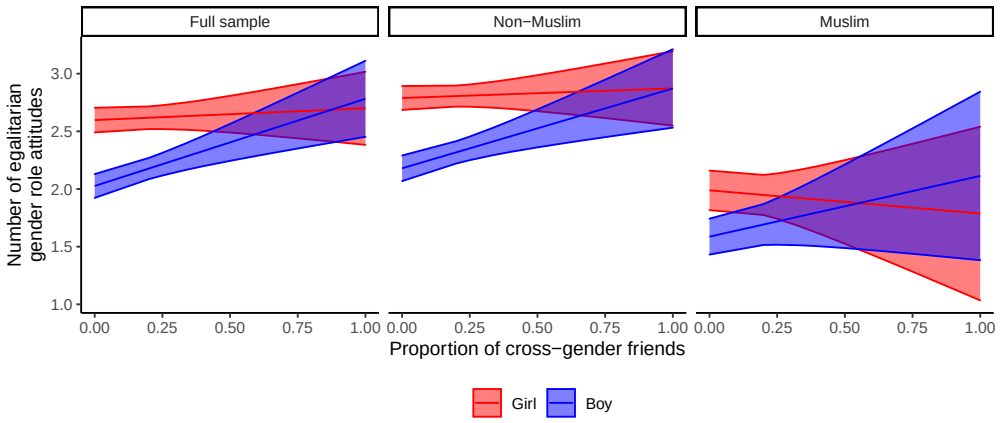
However, as shown in the previous chapter, cross-gender friendships are rare in general, so even if they have considerable effects on gender role attitudes, their consequences on intertemporal change in the distribution of attitudes may be limited. In an additional set of simulations, I therefore explore the *potential* of cross-gender friendships for changing gender role attitudes by assessing how the development of gender role attitudes varies depending on the proportion of cross-gender friendships adolescents tend to have. In these simulations, I again rely on the actual SAOM estimates but vary the proportion of cross-gender friends adolescents have in their initial friendship networks rather than the parameters of cross-gender friends' influence. To that end, I manipulate the actual friendship networks observed in the first wave by replacing same- with cross-gender friendships (or vice-versa), until a target proportion of cross-gender friends is reached. For all simulation analyses, I report averages across 1,000 separate simulations for each classroom to ensure the stochastic nature of the simulations averages out.

6.4 Results

6.4.1 Gender Role Attitudes and their Link with Cross-Gender Friendships

Figure 6.1 displays the distribution of gender role attitudes separately for Muslim boys, Muslim girls, non-Muslim boys, and non-Muslim girls for the first wave of CILS4EU data. In line with previous findings, Figure 6.1 shows girls to hold more egalitarian attitudes than boys and Muslim youth to hold more traditional attitudes than non-Muslim youth. Gender role attitudes are most traditional among Muslim boys with an average of 1.61 (of a maximum of 4) egalitarian attitudes. Muslim girls hold 2.01 egalitarian attitudes on average but are still more traditional than non-Muslim boys with an average of 2.27

Figure 6.2: Gender Role Attitudes by the Proportion of Cross-Gender Friends and Gender in the Full Sample, among Non-Muslim, and among Muslim Youth



egalitarian attitudes. Non-Muslim girls hold the least traditional attitudes, with an average of 2.80 egalitarian attitudes. All group differences are statistically significant ($p < .001$).

As highlighted in Chapter 5, cross-gender friendships are generally rare compared to same-gender friendships. In the sample, only 12% of all friendships are cross-gender friendships. Among non-Muslim boys and girls, the proportion of cross-gender friendships stands at 13%. Among Muslim girls, cross-gender friendships are rarer with only 10% of all friendships, and among Muslim boys, only 9% of friendships cross gender lines.

Figure 6.2 provides a descriptive assessment of the link between cross-gender friendships and gender role attitudes based on data from the first wave. For the full sample and separately for Muslim and non-Muslim youth, Figure 6.2 shows boys' and girls' predicted gender role attitudes at different proportions of cross-gender friends, based on simple linear regression models. The aggregate analysis suggests a gender-specific link between cross-gender friends and gender role attitudes. Among girls, gender role attitudes are independent of cross-gender friends. By contrast, a higher proportion of cross-gender friends is associated with more egalitarian gender role attitudes among boys. Predictions for gender role attitudes become increasingly imprecise at higher proportions of cross-gender friends, in line with the observation that cross-gender friendships are comparably rare.[3]

[3]Substantive results are similar when comparing adolescents who have *no* cross-gender friends to adolescents who have *at least one* cross-gender friend rather than differentiating by the proportion of cross-gender friends (see discussion in footnote 4 for SAOM results). However, given the complexity of estimating influence effects in the face of limited cross-gender friendships, I model

This gendered pattern also holds for the separate analysis of Muslim and non-Muslim youth. The pattern for non-Muslim youth hardly differs from the pattern in the full sample. Among Muslim youth, gender role attitudes are more traditional at each proportion of cross-gender friends. However, like among non-Muslim boys, Muslim boys with cross-gender friends tend to hold more egalitarian attitudes. Only among Muslim girls, there is a slight tendency towards more traditional gender role attitudes at a larger proportion of cross-gender friends, while there is no link at all among non-Muslim girls. All estimates are less precise for Muslim youth, but this is expected given the smaller sample size. Importantly, however, all these results only reflect cross-sectional *associations* of gender role attitudes with cross-gender friends, which comprise both selection and influence effects.

6.4.2 SAOM Results: Separating Selection and Influence Effects

To account for selection effects and provide actual estimates of the influence of cross-gender friends on adolescents' gender role attitudes, I next turn to results from the multilevel SAOMs. In Table 6.1, I display logit coefficient estimates of selection and influence effects, both for the full sample and separately for Muslim and non-Muslim youth (see Table E.1 and Table E.2 in Appendix E.4 for full model results).

The upper part of Table 6.1 addresses *selection* effects and provides estimates of the effect that egalitarian gender role attitudes have on adolescents' tendency to have cross-gender friends. The results suggest no systematic selection of cross-gender friends based on gender role attitudes, neither in the full sample nor in the subsamples of Muslim and non-Muslim youth. This observation holds for both boys and girls. For both genders, point estimates suggest a slight tendency of egalitarian non-Muslim youth to make more cross-gender friends and a slight tendency of traditional Muslim youth to make more cross-gender friends. Yet, none of the estimates are close to being statistically significant (all $p > .2$).

The lower part of Table 6.1 displays estimates of *influence* effects, net of selection. For *girls*, no specification in Table 6.1 suggests an influence of cross-gender friends on gender role attitudes. Estimates are insignificant both in the full sample and in the subsamples of Muslim and non-Muslim youth (all $p > .2$). Point estimates are also close to zero in the full sample and among non-Muslim girls. The point estimate for Muslim girls is larger but estimated imprecisely and not statistically significant either.

variation by the *proportion of cross-gender friendships* in the main text rather than reducing the variance in the key independent variable by dichotomizing it.

Table 6.1: The Link between Cross-Gender Friends and Gender Role Attitudes: Logit Coefficient Estimates of Selection and Influence from the SAOM Analysis

Selection:
Effect of egalitarian gender role attitudes on the tendency to have cross-gender friends

	M1: Full sample	M2: Non-Muslims	M2: Muslims	M2: Difference Muslims − Non-Muslims
Boys	0.003	0.024	−0.091	−0.115
	(0.032)	(0.038)	(0.071)	(0.081)
Girls	0.033	0.048	−0.032	−0.080
	(0.037)	(0.048)	(0.071)	(0.085)
Difference	−0.030	−0.024	−0.059	
Boys – Girls	(0.049)	(0.059)	(0.098)	

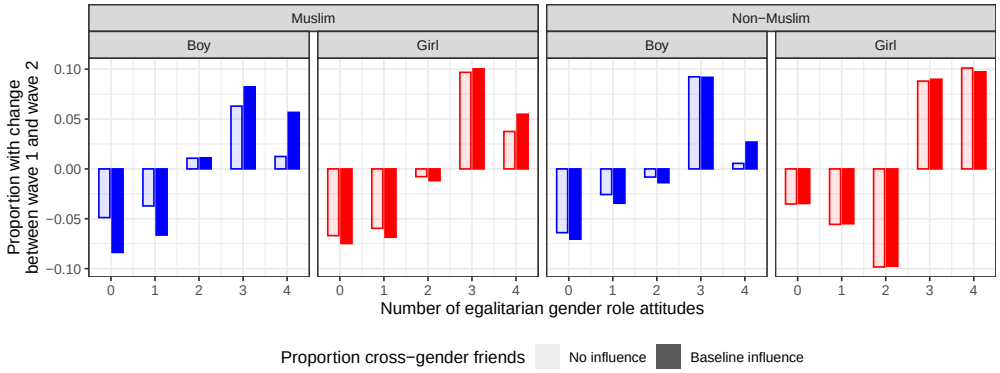
Influence:
Effect of cross-gender friends on the tendency to hold more egalitarian gender role attitudes

	M1: Full sample	M2: Non-Muslims	M2: Muslims	M2: Difference Muslims − Non-Muslims
Boys	0.730^{***}	0.539^{*}	2.360^{**}	1.820^{*}
	(0.224)	(0.237)	(0.795)	(0.815)
Girls	0.077	−0.093	0.691	0.784
	(0.243)	(0.273)	(0.683)	(0.738)
Difference	0.653^{*}	$0.632^{\dagger}$	$1.67^{\dagger}$	
Boys – Girls	(0.329)	(0.354)	(0.922)	

Note: $^{\dagger}p < .10$,$^{*}p < .05$,$^{**}p < .01$,$^{***}p < .001$; two-tailed tests. Posterior means and standard deviations of posterior means in parentheses.

For boys, there is strong evidence that cross-gender friends influence gender role attitudes. After controlling for selection, cross-gender friendships come with more egalitarian attitudes among boys both in the full sample ($b = 0.730$, $p < .001$) and in the subsamples of non-Muslim ($b = .539$, $p < .05$) and Muslim boys ($b = 2.360$, $p < .01$). Differences in the influence of cross-gender friends between boys and girls are statistically significant ($p < .01$ for the full sample and $p < .10$ for the subsamples), supporting the expectation that cross-gender friendships more strongly affect boys' than girls' gender role attitudes. Influence is particularly strong for *Muslim boys*. More so than among non-Muslim boys, cross-gender friends induce more egalitarian gender role attitudes in Muslim

Figure 6.3: Predicted Change in Gender Role Attitudes from Simulations Based on Baseline and No Influence Scenario



boys ($b = 1.820$, $p < .05$).[4]

6.4.3 Simulating the Impact and Potential of Cross-Gender Friendships for the Development of Egalitarian Gender Role Attitudes

To demonstrate the substantive impact of these influence effects on adolescents' gender role attitudes, I next turn to a simulation analysis based on the SAOM results. Combining the SAOM estimates with the observed friendship networks and gender role attitudes from the first wave of data, I simulate distributions of gender role attitudes in the second wave for two scenarios: a baseline *influence* scenario, in which simulations are based on the exact SAOM estimates from Table 6.1; and a *no influence* scenario, in which simulations assume all cross-gender friends' influence to be absent.

For both scenarios and separately for Muslim and non-Muslim boys and girls, Figure 6.3 shows how the distribution of gender role attitudes changes between the first (observed) and second (simulated) wave of data. Positive values indicate gender role attitudes that become more frequent from the first to second wave; negative values indicate gender role attitudes that become less frequent over time. The only difference between the scenarios is the absence of cross-gender friends' influence in the *no influence* scenario. Therefore, a comparison of both shows the contribution of cross-gender friends' influence on the evolution of attitudes over time.

[4]Table E.4 in Appendix E.4 shows that conclusions on gender- and group-specific patterns of cross-gender friends' influence are very similar when distinguishing between adolescents who have *no* or *at least one* cross-gender friend(s). Only among non-Muslim boys, the estimate of the influence of cross-gender friends is no longer statistically significant. Among Muslim boys, it remains statistically significant and large.

Figure 6.4: Predicted Change in Gender Role Attitudes from Simulations Based on Networks with Different Proportions of Cross-Gender Friends for Muslim and Non-Muslim Boys

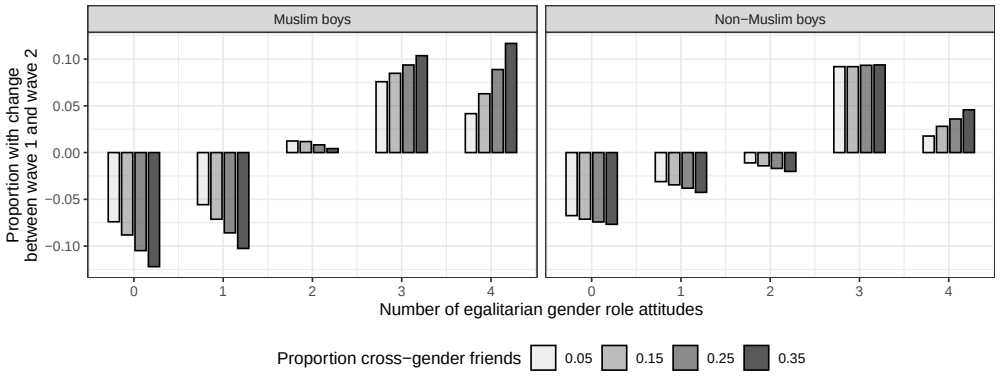


Figure 6.3 shows that, in both scenarios, attitudes become more egalitarian over time. In all groups, the proportion of adolescents with no or a single egalitarian attitude decreases, while the proportion with three or four gender-egalitarian attitudes increases. Discrepancies between the baseline and null model are most notable for Muslim boys, in line with the strong influence effects estimated for Muslim boys. In the *no influence* scenario, only about one percent of boys shift towards fully egalitarian attitudes between waves, while almost six percent do so in the *influence* scenario. Correspondingly, Muslim boys' shift away from traditional attitudes is much stronger in the *influence* than the *no influence* scenario. While a shift of five percentage points due to cross-gender friendships may appear moderate at first sight, it is important to be aware that this shift is driven by a small minority of friendships—only nine percent of Muslim boys' friendships are cross-gender friendships.

Among non-Muslim boys, differences between the *baseline influence* and *no influence* scenario are also visible but smaller; cross-gender friends' influence increases the proportion of non-Muslim boys with only egalitarian attitudes by about two percentage points. This is similar to the effect of cross-gender friends among Muslim girls, though these estimates should be treated with caution, as the underlying estimate of cross-gender friends' influence was not statistically significant. For non-Muslim girls, predicted change hardly differs between the influence and no influence scenarios, in accordance with the null effect of cross-gender friends on attitudes estimated in the SAOM.

The notable shift in the distribution of Muslim boys' gender role attitudes due to cross-gender friends' influence suggests a substantial potential of cross-gender friends to induce more egalitarian gender role attitudes. To illustrate this potential, Figure 6.4 displays results from a second set of simulations that

assesses predicted change in gender role attitudes depending on the proportion of cross-gender friends in boys' friendship networks. The results from this simulation again stress that Muslim boys' gender role attitudes strongly react to the proportion of cross-gender friends. With only five percent of cross-gender friends, about four percent of Muslim boys shift towards fully egalitarian gender role attitudes between wave 1 and wave 2; with 35 percent of cross-gender friends, it is 12 percent of all Muslim boys. Changes towards more egalitarian gender role attitudes at a higher proportion of cross-gender friends are also observed among non-Muslim boys but are much more moderate. This highlights that, given the strong influence of cross-gender friends on Muslim boys, Muslim boys' limited engagement in these friendships is particularly detrimental to their evolution of more egalitarian gender role attitudes.[5]

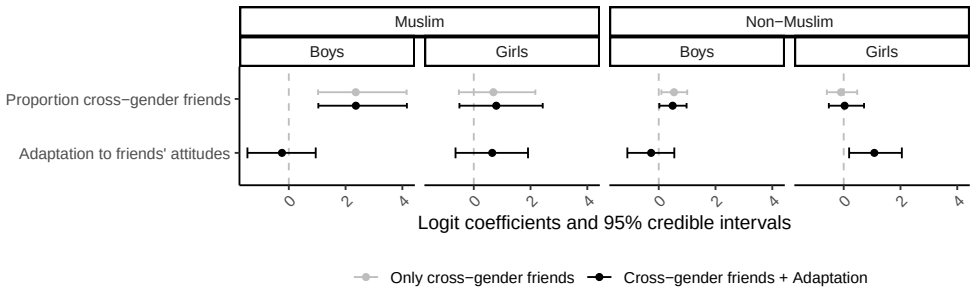
6.4.4 Adaptation of Attitudes or Reduction of Gender Stereotypes? Exploring the Mechanisms behind Cross-Gender Influence

What mechanism is responsible for boys' change in gender role attitudes in reaction to cross-gender friendships? In the theoretical discussion, I highlighted two potential mechanisms: an adaptation to (cross-gender) friends' gender role attitudes via peer pressure and an exchange of ideas on the one hand; and a reduction of gender stereotypes on the other. Precisely determining the contribution of both mechanisms is not possible with the CILS4EU data, as no information on gender stereotypes is available. However, it is possible to not only model the aggregate effect of cross-gender friends on attitudes in the SAOMs but also to directly account for the adaptation of friends' gender role attitudes. This adaptation models whether youth assimilate their friends' gender role attitudes over time.[6] If adaptation is responsible for cross-gender friends' influence, a SAOM that models both adaptation and the influence of cross-gender friendships should display notable adaptation effects and a decrease in cross-gender friends' influence once adaptation is accounted for. If there is no

[5]These simulations are more hypothetical than those varying influence estimates, because they are not based on observed but manipulated friendship networks. Networks with a substantially larger or smaller proportion of cross-gender friends may also differ in other properties, which are not modelled here. For that reason, I only provide simulations for proportions of cross-gender that are relatively close to the observed proportions (9-13%). The further the proportion of cross-gender friendships moves away from the observed proportion, the less likely the specified SAOM is to also apply to these networks.

[6]I model adaptation with the *avSim* effect, specified separately for Muslim and non-Muslim youth and boys and girls. In this extended model, I also account for the selection of friends with similar gender role attitudes (separately for Muslim and non-Muslim boys and girls, including the *gender role attitudes alter* and *gender role attitudes similarity* effects) because otherwise, adaptation can be confounded by selection.

Figure 6.5: Effect of Cross-Gender Friends on the Tendency to Hold More Egalitarian Gender Role Attitudes with and without Accounting for Adaptation to Friends' Attitudes. Results from SAOM Analysis



such change, this provides preliminary indirect evidence on the role of gender stereotypes, the alternative influence mechanism.

In Figure 6.5, I display estimates of cross-gender friends' influence and of adaptation to friends' gender role attitudes from a joint model that accounts for both processes (see Table E.3 in Appendix E.4 for full model results). To see how estimates of cross-gender friends' influence *change* once adaptation is accounted for, Figure 6.5 also displays the original influence estimates from the previous analysis.

The results from Figure 6.5 suggest that a general adaptation to friends' gender role attitudes is *not* the driving force of cross-gender friends' influence on Muslim and non-Muslim boys' gender role attitudes. Estimates of adaptation are negligible among both Muslim and non-Muslim boys and, accordingly, estimates of cross-gender friends' influence remain largely unchanged when adaptation processes are accounted for. There is evidence of adaptation among girls, though. Non-Muslim girls develop more egalitarian attitudes if their friends hold more egalitarian attitudes ($p < .05$). The point estimate for Muslim girls is positive as well, though smaller and not statistically significant ($p > .2$). However, there is no influence of cross-gender friends on the attitudes of girls, neither before nor after accounting for adaptation.

Rather than adaptation, these analyses suggest that the second plausible mechanism of cross-gender friends' influence—the reduction of gender stereotypes—is more likely to be responsible for the more egalitarian attitudes boys develop in reaction to cross-gender friendships. This evidence is only indirect, though, as no measures of gender stereotypes are available in the data.

6.5 Discussion

Cross-gender friends can provide first-hand insights into the perspective, characteristics, and attitudes of the other gender. Therefore, cross-gender friends are in a unique position to shape adolescents' gender role attitudes, holding the potential to shift them into a more egalitarian direction (McHale et al. 2004; Sippola 1999).

However, changing gender role attitudes in response to cross-gender friends requires *having* cross-gender friends. In the previous chapter, I have established that Muslim youth are less likely than their non-Muslim peers to make cross-gender friends and therefore less likely to be exposed to cross-gender influence. Following the proposition that cross-gender friends can support the development of more egalitarian attitudes, Muslim youths' lack of cross-gender friendships may therefore be one source of their more traditional gender role attitudes (Kretschmer 2018; la Roi & Mood 2022). As Western societies aspire for gender equality, these traditional attitudes have become a source of conflict between Muslims and non-Muslims (Choi et al. 2023; Sniderman & Hagendoorn 2009). At the same time, traditional attitudes can also cause friction within Western Muslim communities as these increasingly diversify in terms of their perspectives on gender roles (Glas 2023; Röder & Mühlau 2014).

Despite its relevance for understanding Muslim youths' more traditional gender role attitudes, empirical research on cross-gender friends' influence on gender role attitudes has been lacking, both for adolescents in general and Muslim youth specifically. In this chapter, I used longitudinal social network models to provide estimates of cross-gender friends' influence. At the same time, my analyses accounted for whether adolescents select cross-gender friends based on their gender role attitudes, as not only the influence of cross-gender friends, but also their selection, can result in a link between gender role attitudes and cross-gender friendships.

The results showed that Muslim boys with cross-gender friends adopted markedly more egalitarian gender role attitudes over time. Cross-gender friends also shifted non-Muslim boys' gender role attitudes into a more egalitarian direction, but cross-gender friends' influence was notably stronger among Muslim than non-Muslim boys. By contrast, there was no evidence that cross-gender friends influence the gender role attitudes of either Muslim or non-Muslim girls. Similarly, adolescents' selection of cross- and same-gender friends did not vary by their gender role attitudes, a conclusion that held for boys and girls as well as for Muslim and non-Muslim youth.

For Muslim boys and, to a lesser degree, for non-Muslim boys, cross-gender friendships thus hold potential for shifting gender role attitudes into a more

egalitarian direction. As cross-gender friends' influence is asymmetric, this is not accompanied by a simultaneous re-traditionalization of girls. Given their strong influence on Muslim boys' gender role attitudes, Muslim boys' lack of cross-gender friendships thus is one factor hampering their adoption of more egalitarian attitudes. Accordingly, simulations based on the social network analyses demonstrated that an increase in cross-gender friendships may result in substantially more egalitarian attitudes among Muslim boys.

Other than for Muslim boys, findings for Muslim girls were not fully conclusive. Though less so than for Muslim boys, point estimates for Muslim girls also supported an adoption of more gender-egalitarian attitudes in reaction to cross-gender friendships. Yet, these estimates were not statistically significant. It is worth noting that precisely estimating a moderately-sized influence effect, such as the one suggested by the point estimate for Muslim girls, is challenging in longitudinal social network models, particularly with a limited sample (of Muslim girls) (Stadtfeld et al. 2020). With the data at hand, it was therefore not possible to determine whether the result is due to the limited sample of Muslim girls or the absence of a substantive effect. For non-Muslim girls, there was no statistically significant influence effect either, but this estimate was both close to zero and estimated precisely, suggesting the absence of (substantial) influence by cross-gender friends.

Analyses aimed at identifying the mechanisms behind cross-gender friends' influence on Muslim and non-Muslim boys' gender role attitudes suggest that a general adaptation to friends' gender role attitudes is not the key source of influence. Neither Muslim nor non-Muslim boys adapted to their friends' gender role attitudes over time and, accordingly, estimates of cross-gender influence remained unchanged when accounting for (non-)adaptation. Therefore, a reduction of gender stereotypes, the second suggested mechanism linking cross-gender friends to gender role attitudes, is more likely to be responsible for cross-gender friends' influence on gender role attitudes. This reduction of gender stereotypes may be particularly strong among *Muslim boys* because, in the face of the diverging signals on appropriate gender role attitudes from egalitarian mainstream institutions and their more traditional families and communities, they may turn to friends as role models. However, neither the reduction of stereotypes nor the specific rationale for the strong influence Muslim boys experience can be tested directly with the data at hand. Accordingly, a key task for future research is to explicitly assess this mechanism to fully understand cross-gender friends' influence on gender role attitudes.

Despite the finding that boys do not adapt to their friends' gender role attitudes *in general*, a related question concerns whether there may still be

adaptation to *specific* friends—and cross-gender friends in particular. In cross-gender friendships, issues that surround gender may be much more salient than in same-gender friendships, so adaptation may be specific to these friendships but absent in same-gender friendships. As cross-gender friendships are rare relative to same-gender friendships, this cross-gender specific adaptation may be buried under the nonadaptation to same-gender friends. Unfortunately, further differentiating between influence effects to capture this gender-specific process was not possible given the limited number of cross-gender friendships in the data, but this should be assessed in future studies.

A final important question for future research concerns the *long-term* consequences and development of cross-gender friendships. In this chapter, I only provided a short-term perspective, investigating cross-gender friends and gender role attitudes over the course of one year. The influence cross-gender friends exert beyond this time span thus could not be captured. Though short-term influence turned out to be substantial, particularly among Muslim boys, the impact of cross-gender friends may be even stronger in the long run. Fully dismantling stereotypes and changing attitudes frequently requires a variety of experiences that challenge preconceptions, thus demanding a considerable investment of time (Hewstone et al. 1992; Hilton & von Hippel 1996). The short time frame also implies that only a snapshot of adolescents' friendship networks is captured. In adolescence, friendship networks change markedly over time, and cross-gender friendships become increasingly common as adolescence progresses (Poulin & Pedersen 2007; Strough & Covatto 2002). At the same time, adolescents' cross-gender friendships may be more fragile than their same-gender friendships, so cross-gender friends' influence on gender role attitudes may also vanish if these relationships dissolve in the longer run. Fully picking up cross-gender friends' influence in the face of friendship networks' changing composition thus requires a longer-term perspective.

Conclusion

In this chapter, I have demonstrated that cross-gender friends do not systematically change adolescent *girls'* gender role attitudes but induce more egalitarian gender role attitudes among adolescent *boys*. This influence of cross-gender friends is particularly strong among Muslim boys. At the same time, Muslim boys rarely engage in cross-gender friendships, so the strong influence emanating from these friendships rarely takes effect. Cross-gender friendships are thus particularly rare among those youth who both hold the most traditional gender role attitudes and face the greatest potential for changing their

attitudes in reaction to cross-gender friendships. Accordingly, the lack of cross-gender friendships the previous chapter has shown chastity norms to induce among young Muslims hampers Muslim boys' cultural integration into Western societies in terms of their gender role attitudes.

Chapter 7

General Discussion

In this book, I have studied the friendships of Western Muslim youth, asking whether gender-related norms—though primarily targeted at *romantic relationships*—also impinge on their friendship-making. To that end, I considered two types of friendships and two types of gender-related norms. First, I addressed *interreligious friendship-making* and *endogamy norms*. Building on research that shows endogamy norms to more strongly oppose Muslim girls' than Muslim boys' interreligious romantic relationships, I asked whether these norms also constrain Muslim girls' friendship-making with non-Muslims. Then, I considered *cross-gender friendships* and *chastity norms*. Here, I asked whether the constraints chastity norms impose on Muslim youths' romantic relationships and premarital sexual activity also complicate their cross-gender friendship-making.

In this concluding chapter, I first summarize the main insights on interreligious and cross-gender friendships that the five substantive chapters have provided. Subsequently, I discuss key overarching conclusions on the influence gender-related norms have on friendship-making as well as implications of these conclusions for both Muslim youth in the West and the study of intergroup relations. Finally, I highlight directions for future research based on the follow-up questions that the insights from this book raise.

7.1 A Look Back: Chapter Summaries and Insights

7.1.1 Part I: Interreligious Friendship-Making

The research in the first part of this book concerned Western Muslim youths' interreligious friendship-making. Its starting point was a well-established pattern documented in the literature on interreligious romantic relationships: the observation that female Muslims less frequently have interreligious romantic relationships than male Muslims (e.g., Carol 2016b; Qvist & Qvist 2023;

Van Pottelberge et al. 2021; van Zantvliet et al. 2015). This gender gap is usually attributed to gendered endogamy norms that more strongly oppose the intergroup dating and intermarriage of female than of male Muslims.

Based on this established finding, I asked whether gendered endogamy norms also affect social interaction beyond romantic relationships and therefore produce gender-specific patterns of interreligious *friendship-making* among Muslim youth. These spillover effects of endogamy norms may arise either because Muslim parents may constrain their daughters' intergroup friendships for the risk they bear for intergroup romance or because, having internalized these norms, Muslim girls themselves may limit close interreligious contact (Carol 2014; Hennink et al. 1999; Talbani & Hasanali 2000). I captured these considerations in my first research question, asking:

Research Question 1:
Do Muslim girls engage less in interreligious friendship-making than Muslim boys, and is this due to gendered endogamy norms?

However, I argued that providing a satisfactory answer to this question also required considering the receiving party of Muslims' interreligious friendship-making—non-Muslim youth. In particular, I suggested that a strong focus of Muslim girls on in-group friendships may not only emerge from gendered endogamy norms, but also from differences in how open non-Muslims are to friendships with Muslim boys and girls. Acknowledging that there may be reasons to expect non-Muslims to be more reluctant towards friendships with Muslim girls than boys but also vice-versa, I asked, as a more open-ended question:

Research Question 2:
Do non-Muslims differ in their reluctance to befriend Muslim boys and Muslim girls?

I addressed these research questions in Chapters 2-4.

Chapter 2: Gendered Interreligious Friendship-Making among Muslim and Non-Muslim Youth and the Creation of Religious Friendship Segregation

In Chapter 2, I started from the observation that any friendship segregation between Muslim and non-Muslim youth can originate from both Muslim youths' in-group bias and from a reluctance of non-Muslims to befriend their Muslim peers. Building on the literature on gender-specific intergroup romance among Western Muslims and non-Muslims' stereotypes about male and female

Muslims, I developed expectations on gendered Muslim in-group bias as well as gendered non-Muslim reluctance. Due to Muslim girls' strong endogamy norms and their potential spillover effects on friendship-making, I expected in-group bias to be stronger among Muslim girls than among Muslim boys. Due to gendered stereotypes, I expected non-Muslims to be more reluctant towards friendships with Muslim boys rather than girls, sharpening my expectations relative to the more open-ended research question I started with. While the literature on gendered stereotypes suggests that Muslim girls do face specific stereotypes as well as potential discrimination if they wear the headscarf (Abo-Zena 2019; Zempi & Chakraborti 2014), it also demonstrates particularly strong and highly negative stereotypes non-Muslims hold about male Muslims (Erentzen et al. 2022; Fourgassie et al. 2023).

I investigated these gendered expectations with two waves of German large-scale survey network data on 14-16-year-old adolescents and recently developed random-coefficients multilevel stochastic actor-oriented models for network evolution (Koskinen & Snijders 2023). Consistent with my expectations, I found a stronger in-group bias among Muslim girls than among Muslim boys. In addition, I found non-Muslims to be reluctant towards friendships with Muslim boys, but much more open to friendships with Muslim girls. Both Muslim in-group bias and non-Muslim reluctance thus emerged as highly gendered processes.

Despite these gender-specific mechanisms, simulation analyses highlighted very similar overall levels of segregation in the reciprocated friendships of both Muslim boys and girls. This shows that aggregate levels of segregation can mask substantial variation in the processes underlying it. Therefore, it is essential to break down segregation into the (gendered) individual-level mechanisms underlying it in order to understand it fully.

Substantively, the main conclusion from Chapter 2 is that interreligious friendship-making among Muslim and non-Muslim youth is highly gender-specific. Furthermore, Muslim girls' strong in-group bias is consistent with the idea that endogamy norms constrain their interreligious friendship-making in adolescence. This expectation is reinforced further by the observation that in-group bias proved stronger in cross- rather than same-gender friendships.

These gendered patterns of friendship-making also highlighted important *asymmetries* in the openness to interreligious friendships: non-Muslims were comparably open to friendships with Muslim girls, but Muslim girls themselves focused on in-group friendships. By contrast, Muslim boys exhibited a low in-group bias, but non-Muslims were hesitant to form friendships with them. These asymmetries raised the question of how friendship-making develops over time and whether gendered processes of friendship-making become interdependent

in the long run. Expectations of a dynamic impact of gendered endogamy norms on Muslim girls' friendships—alongside the actual risk of interreligious romance—further strengthened this interest in an intertemporal perspective of intergroup friendships. Both of these considerations led to the question of how gendered friendship-making develops over the course of the adolescent years, which I assessed in the next chapter.

Chapter 3: Stable or Dynamic? The Development of Gendered Interreligious Friendship-Making in Adolescence

In Chapter 3, I turned from a short-term assessment of gendered interreligious friendship-making to a dynamic one. My expectations on intertemporal change in friendship-making were strongest for Muslim girls. With romantic relationships becoming increasingly widespread and serious in adolescence, I expected endogamy norms to regulate the interreligious friendships of Muslim girls more and more over time. I also considered reactions of non-Muslims to Muslim girls' strong in-group bias as well as reactions of Muslim boys to strong reluctance from non-Muslims, both documented in Chapter 2. At the same time, I curbed my expectations of drastic intertemporal change, as previous meta-analytical studies suggest stability rather than change in intergroup prejudice and attitudes in adolescence (Crocetti et al. 2021; Raabe & Beelmann 2011). Abstracting from the specifics of the interaction of Muslims and non-Muslims, this would also suggest limited systematic change in adolescents' intergroup friendships.

I studied the dynamics of interreligious friendship-making with six waves of longitudinal social network data on Muslim and non-Muslim youth aged 11 to 17. Using both fixed-effects growth curve models and stochastic actor-oriented models for network evolution, I found that Muslim girls' in-group bias rises steeply and continually throughout adolescence. By contrast, there was no evidence of substantial change in either Muslim boys' in-group bias or gender-specific reluctance among non-Muslims. A marked deviation from Chapter 2 was that non-Muslim youth proved just as reluctant towards friendships with Muslim girls as towards those with Muslim boys.

Despite this divergent finding on gendered non-Muslim reluctance, all findings on Muslim girls' friendship-making matched my expectations of the influence of gendered endogamy norms. In early adolescence, when romantic relationships are still rare and endogamy norms less salient, Muslim girls' in-group bias was low. However, as adolescence progressed, Muslim girls became increasingly focused on in-group friendships, in line with a higher risk of romantic relationships and a heightened salience of endogamy norms. Furthermore, the analyses suggested an earlier and more rapid increase of in-group bias in

friendships with boys than in friendships with girls, in line with the more direct risk for interreligious romantic relationships these cross-gender friendships imply. While results on non-Muslim youths' gendered reluctance differed from those in the previous chapter, they again did not support the notion that Muslim girls' in-group bias may be a reaction to a strong rejection they face from non-Muslims.

Consistently, the patterns and trends of interreligious friendship-making from Chapter 2 and 3 thus suggest that, by mid-to-late adolescence, Muslim girls are less open to interreligious friendship-making than Muslim boys. Accordingly, by that time, a *gender gap* in Muslim youths' interreligious friendship-making has emerged. Throughout the analyses so far, observations were also in line with the idea that this gender gap is a consequence of restrictions to interreligious friendship-making Muslim youth face due to endogamy norms. However, none of the observations provided *direct evidence* that endogamy norms are indeed responsible for the gender gap. Documenting this influence of endogamy norms was the goal of Chapter 4.

Chapter 4: Endogamy Norms and the Gender Gap in Muslim Youths' Interreligious Friendships: Evidence from Two Studies

Gendered endogamy norms that more strongly oppose the interreligious friendship-making of Muslim girls than of Muslim boys are well-established in the literature (e.g., Carol & Teney 2015; Cila & Lalonde 2014; Van Pottelberge et al. 2019). What is not documented so far, is how these norms are related to outgroup friendships, and whether they can explain the gender gap in Muslim youths' interreligious friendship-making the previous chapters have detected. While one previous study suggests that endogamy norms are related to in-group friendships (Carol 2014), this study is limited to adults and not concerned with gender differences. Relying on two empirical studies, in Chapter 4 I therefore set out to collect evidence on the role of endogamy norms in Muslim youths' friendship-making and their contribution to the gender gap in interreligious friendships.

Employing random-effects growth curve models, the first study analyzed the same six-wave survey network data as in Chapter 3. With this data, I investigated whether the gender-specific development and the gender-specific effects of religiosity, parental control, and leisure time activities could explain the emerging gender gap in in-group friendship-making. Endogamy norms can operate through all of these factors (Carol & Teney 2015; Cila & Lalonde 2014; Hennink et al. 1999), so their contribution to the gender gap in interreligious friendship-making is also likely to at least partially reflect the influence of these

norms. In the analyses, one third of the emerging gender gap in interreligious friendship-making could be attributed to these factors, with religiosity and parental control having greater explanatory power than leisure time activities. However, in the absence of a direct norms measurement, these findings necessarily provided only tentative evidence on the contribution of gendered endogamy norms to the gender gap.

In a second, cross-sectional study among 18-19-year-old adolescents, I therefore investigated the contribution of gendered endogamy norms with data that provides explicit measurements of these norms. In analyses with linear probability models, I found that half of the gender gap in in-group friendship-making could be attributed to the stronger religious endogamy norms Muslim girls held compared to boys. The influence of endogamy norms also persisted when accounting for potential alternative explanations. Comparing different types of endogamy norms, norms on *religious* endogamy were predictive for interreligious friendship-making, while norms on *ethnic* endogamy were not. Finally, differentiating between the influence of adolescents' and their parents' religious endogamy norms proved challenging because both norms were highly correlated. Still, the results suggested parental endogamy norms to be associated with a stronger focus on in-group friendship-making even when accounting for Muslim youths' own norms. Other than among adults (Carol 2014), parental endogamy norms thus seem to not only shape friendship-making through the intergenerational transmission of norms, but also through other processes. While separating the influence of adolescents' and their parents' norms proved challenging, evidence on the *overall* contribution of endogamy norms to gendered friendship-making was unequivocal: Across all specifications considered, religious endogamy norms emerged as the strongest and most consistent predictor of the gender gap in in-group friendships.

Though based on very different conceptual and methodological approaches, both empirical studies in Chapter 4 supported the notion that gendered endogamy norms may be a key force contributing to Muslim youths' gendered interreligious friendship-making. Corroborating these findings is an important task for future research, as the studies in this chapter could not employ a social network methodology and provided correlational evidence only. Still, in the absence of obvious confounders and alternative explanations, the converging evidence of both studies at least tentatively points to gendered endogamy norms as a key driving force of the gender gap in interreligious friendship-making.

To conclude the recapitulation of the first part of this book, I return to the two research questions guiding my investigation of gendered patterns of interreligious friendship-making. In terms of differences between Muslim boys and girls, I have detected evidence that Muslim girls (start to) engage less in

interreligious friendship-making than Muslim boys in adolescence. This pattern was unequivocal in four empirical studies. Across all studies, all patterns were also consistent with the notion that gendered endogamy norms increasingly constrain the interreligious friendships of Muslim girls as adolescence progresses. Finally, two studies that more closely investigated the determinants of the gender gap provided more direct evidence on the operation of endogamy norms. In terms of my first research question, I thus conclude that adolescent Muslim girls indeed are less involved in interreligious friendship-making than Muslim boys, and that this difference is likely to, at least in substantial parts, be a consequence of gendered endogamy norms.

By contrast, I cannot provide an unambiguous answer to my second research question, which asked whether non-Muslims differ in their reluctance towards friendships with Muslim boys and girls. While Chapter 2 documented stronger non-Muslim reluctance towards boys, Chapter 3 did not find evidence for a gendering of non-Muslims' openness to interreligious friendship-making. What both chapters agreed on, however, is that there was no indication of a stronger reluctance of non-Muslims towards friendships with Muslim girls. Similarly, Chapter 4 did not suggest that Muslim girls experience greater discrimination than Muslim boys. In all studies, a specific reluctance of non-Muslims towards interaction with Muslim girls could thus be ruled out as a viable explanation for Muslim girls' strong focus on in-group friendships in adolescence. In terms of my initial motivation to ask this research question—to safeguard against misattributing Muslim girls' stronger focus on in-group friendships—results therefore are conclusive. Whether Muslim boys and girls face similar reluctance or whether non-Muslims are particularly reluctant towards Muslim boys, however, seems to depend on situation-specific factors. Jointly with the more general question of what may be behind Muslim youths' (gendered) reluctance, I return to these observations later on in this chapter.

7.1.2 Part II: Cross-Gender Friendship-Making

In the second part of this book, I turned from Muslim youths' interreligious to their *cross-gender friendships*. I suggested that, just like interreligious friendships can be constrained by *gendered endogamy norms*, cross-gender friendships may be constrained by *chastity norms* that oppose premarital sexual activity. I also wanted to know whether a corresponding lack of cross-gender friendships can hamper the cultural integration of Muslim youth regarding their gender role attitudes.

Chapter 5: Chastity Norms and the Cross-Gender Friendship-Making of Muslim and non-Muslim Youth

In Chapter 5, I started from the established observation that Muslim youth engage in romantic relationships and sexual activity less frequently than their Western non-Muslim peers (e.g., de Graaf et al. 2017; Wong et al. 2017; Yahyaoui et al. 2013; Yip & Page 2016). In the past literature, this finding has frequently been attributed to chastity norms, which prohibit premarital sex, but, in many Muslim communities, also come with regulations on cross-gender interaction more broadly (Altinyelken et al. 2022; Scourfield et al. 2013; Velayati 2016). This critical stance on cross-gender interaction suggests that chastity norms may also influence cross-gender interaction beyond romantic relationships, which led me to ask:

Research Question 3:
Do Muslim youth engage less in cross-gender friendships than non-Muslim youth, and is this due to chastity norms?

Answering this question required me to focus on friendship-making in a context that provides Muslim youth with *opportunities* for cross-gender friendships. After all, religious and social activities in many Muslim communities are gender-segregated, so even if Muslim youth preferred to engage in cross-gender friendships, they cannot realize these preferences in these contexts (Altinyelken et al. 2022; Velayati 2016). To understand cross-gender friendship-making beyond the constraints imposed by gender segregation, I thus studied friendships in the context of coeducational Western schools. In line with the considerations and findings on interreligious friendship-making from the first part of this book, I theorized on both the potential impact of parents' and youths' own chastity norms, as well as on gender differences—as chastity norms tend to be more strictly enforced among Muslim girls than boys (Hawkey et al. 2018; Hendrickx et al. 2002).

To investigate the role of chastity norms in cross-gender friendship-making, I applied recently developed multilevel exponential random graph models (Stewart et al. 2019) to large-scale network survey data on Muslim and non-Muslim youth in Germany. I found that only 13 percent of all friendships crossed gender lines, so cross-gender friendships were rare in general. However, with 10 compared to 14 percent, cross-gender friendships were notably less frequent among Muslim than non-Muslim youth. Yet, accounting for youths' chastity norms fully explained this gap: Not only did Muslim youth more frequently hold stronger chastity norms than their non-Muslim peers, but these norms

were also strongly predictive of same- rather than cross-gender friendship-making. By contrast, there was no variation in non-Muslim youths' cross-gender interaction according to chastity norms. Other than Muslim adolescents' own chastity norms, parental norms did not prove relevant for in-school cross-gender friendship-making. There was also no evidence that chastity norms constrain Muslim girls' cross-gender friendships more than Muslim boys'.

In terms of the research question Chapter 5 posed, I conclude that Muslim youth indeed less frequently engage in cross-gender friendship-making than their non-Muslim peers, and that this difference can be explained by chastity norms. Like the first part of this book, this chapter therefore provides evidence that, among Western Muslim youth, norms on romantic relationships have spillover effects on friendship-making.

However, other than on the interreligious friendships studied in the first part of this book, we have limited knowledge of the implications a lack of cross-gender friendships can have for Muslim youth, particularly from an integration perspective. Limited interethnic and interreligious friendships are connected to both intergroup relations and minority integration—but what about cross-gender friendships? In the last substantive chapter, I set out to at least provide a first partial answer to this question.

Chapter 6: The Influence of Cross-Gender Friends on Muslim Youths' Gender Role Attitudes

Having detected that Muslim youth engage less in cross-gender friendships than their non-Muslims peers, this chapter asked whether this lack of cross-gender friendships has implications for Muslim youths' integration into Western societies. I focused on consequences for Muslim cultural integration, investigating whether cross-gender friendships are associated with more *egalitarian gender role attitudes* among Muslim youth. Discussions on gender equality are a key source of cultural conflict between Muslims and non-Muslims in the West (Choi et al. 2023; Sniderman & Hagendoorn 2009), so a link between cross-gender friendship-making and gender role attitudes would suggest tangible implications of Muslim youths' limited cross-gender interaction for their integration into Western societies. While past research has suggested cross-gender friendship-making to facilitate the development of more egalitarian gender role attitudes, this assertion has not been submitted to rigorous empirical testing yet (Sippola 1999; Bryant 2003). Accordingly, I asked:

Research Question 4:
Do cross-gender friendships induce more egalitarian gender role attitudes among Muslim youth?

Answering this question required me to first theoretically establish different potential channels of cross-gender influence, to differentiate between how influence processes operate among boys and girls, and to consider which specific considerations hold for Muslim youth.

I then tested cross-gender friends' influence on gender role attitudes with two waves of large-scale network survey data on Muslim and non-Muslim youth and stochastic actor-oriented models for the coevolution of networks and gender role attitudes. In these analyses, I found that boys with cross-gender friends develop more egalitarian attitudes, and that this influence of cross-gender friends is particularly strong for Muslim boys. By contrast, there was no evidence that girls—both Muslim and non-Muslim—change their attitudes in reaction to cross-gender friendships. Indirect evidence suggested that changes in boys' gender role attitudes follow from a dismantling of gender stereotypes rather than from an adaptation to girls' more egalitarian attitudes.

Coming back to the research question, I conclude that cross-gender friendships indeed induce more egalitarian gender role attitudes—at least among Muslim boys. Accordingly, cross-gender friendships affect at least one component of cultural integration, bringing out a new quality to the limited cross-gender friendships documented in Chapter 5: Chastity norms, which I found to explain Muslim youths' lower involvement in close cross-gender interaction, do not only affect friendship-making but, indirectly, also impinge on Muslim youths' integration into Western societies more broadly.

7.2 The Bottom Line: Gender-Related Norms Shape Muslim Youths' Friendship-Making

Where does the evidence collected throughout the five substantive chapters of this book leave us? Compressed into a single sentence, my key conclusion is: *Gender-related religious norms constrain the friendship-making of Muslim youth in the West*.

What we already knew prior to the writing of this book was that gender-related religious norms matter for Western Muslims' *romantic relationships*. Due to gendered endogamy norms, Muslim girls and women date and marry less across religious lines than Muslim boys and men (Carol 2016b; Mood & Jonsson 2022; Qvist & Qvist 2023; Van Pottelberge et al. 2019; Wachter & de Valk 2020; van Zantvliet et al. 2015). Due to chastity norms, Muslim youth are less frequently involved in romantic relationships and premarital sexual activity than their non-Muslim peers, a pattern that again is strongest for female Muslims (de Graaf et al. 2017; Wong et al. 2017; Yahyaoui et al. 2013; Yip & Page 2016).

What we have learned throughout this book is that, though both types of norms target romantic relationships, they also have consequences for Muslim youths' *friendships*. Accordingly, the impact of gender-related religious norms does not stop at the threshold of romance, but shapes Muslim youths' social relationships more generally.

Across the substantive chapters of this book, evidence on the influence of gender-related norms has emerged both from the patterns of friendship-making and from more explicit assessments of the underlying mechanisms. In terms of close interreligious contact, the analyses have shown that Muslim girls are less engaged in interreligious friendships than Muslim boys, that this gender gap emerges in and increases throughout adolescence, and that gendered endogamy norms explain substantial parts of it. In terms of close cross-gender contact, I have found that, even if they have ample opportunities for cross-gender interaction, Muslim youth are less frequently involved in cross-gender friendships than their non-Muslim peers, a difference that is fully accounted for by Muslim youths' stronger chastity norms. Each specific data source and each specific analytical strategy employed to identify these patterns and mechanisms has its specific limitations. Accordingly, each specific finding can and should be called into question in future research. In sum, however, the convergent findings across different types of friendships, different types of norms, different data sets, and different empirical strategies lend credibility to the conclusion that gender-related religious norms shape Muslim youths' friendship-making.

Having arrived at this conclusion, what are the *implications* of the influence gender-related religious norms exert on Muslim youths' friendship-making?

Starting with the impact of gendered endogamy norms on Muslim girls' *interreligious friendship-making*, the findings in this book suggest both good and bad news. The good news first: With a substantial portion of Muslim girls' focus on in-group friendship-making presumably driven by endogamy norms, there is reason to hope that this gendered pattern does not reflect a particularly conflictual group boundary between Muslim girls and non-Muslims. After all, endogamy norms primarily disapprove of close interreligious relations because they entail specific risks of romantic relationships, not because of a general rejection of the out-group or negative intergroup attitudes. While interreligious friendship-making among Muslim girls may be rare, this therefore is not likely to either reflect general reservations toward non-Muslims or a specific skepticism towards Muslim girls on the part of non-Muslims either. The fact that this book provides little evidence of a specific discrimination of Muslim girls compared to boys further fuels this hope, though drawing this conclusion with full confidence requires further research, as discussed later.

The bad news: Independent of whether Muslim girls' focus on in-group friendships reflects tense group boundaries or not, it is likely to have consequences. With Muslim girls' focus on in-group friendships particularly strong in late adolescence, consequences for structural integration are an obvious concern. In late adolescence, youth make long-term decisions on their education and entry into the labor market, and having non-Muslim majority friends who tend to be better acquainted with these institutions than their own immigrant-origin families (Kristen 2008; Kretschmer 2019) can help with these decisions. Majority friends can also facilitate language acquisition (Moyer 2008) or cultural integration in terms of gender role attitudes (Kretschmer 2018; Ng 2022b). Therefore, Muslim girls' limited social integration can impinge on their integration in other domains.

At the same time, a focus on in-group friendship-making can impede the progress of intergroup attitude improvement, as intergroup friendships' potential for dismantling stereotypes and improving out-group attitudes is well-established (e.g., Davies et al. 2011; Pettigrew & Tropp 2006). This would be particularly problematic if the boundary between Muslim girls and non-Muslims were highly conflictual, but, as discussed above, this is not what the strong influence of endogamy norms on interreligious friendships suggests. Still, given the bright boundary between Western Muslims and non-Muslims in general, continuously dismantling stereotypes is important, a process that is slowed down by in-group friendship-making. This also concerns stereotypes of non-Muslims, which may be amplified by Muslim girls' focus on in-group friendship-making.

In terms of *cross-gender friendships* and the constraints Muslim youths' chastity norms impose on them, conclusions on group boundaries mirror those concerning interreligious friendships. As differences in Muslim and non-Muslim youths' cross-gender friendship-making could be attributed to chastity norms, there is no indication that gender boundaries are particularly conflictual among Muslim adolescents. Chastity norms mean that, for reasons of modesty, cross-gender friendships may be considered inappropriate, but they do not indicate sexist attitudes or a general aversion to the other gender—which would signal much more conflictual group boundaries.

Still, the fact remains that Muslim youth engage less in cross-gender friendships than their non-Muslim peers, and this, like Muslim girls' limited interreligious friendships, is likely to have consequences. In particular, I have devoted one chapter of this book to demonstrating how cross-gender friendships relate to Muslim youths' cultural integration in terms of their gender role attitudes. In this assessment, I have shown that cross-gender friends induce more egalitarian attitudes among Muslim boys. Accordingly, Muslim boys' lack of cross-gender

friendships allows more traditional gender role attitudes to persist, limiting their cultural integration in an area that is a key source of cultural conflict between Muslims and non-Muslims.

Finally, and apart from these practical implications, this book also provides the more conceptual lesson that appropriately capturing how religion shapes Muslim youths' social relationships requires a nuanced perspective on religiosity and religious norms. Throughout the book, the importance of carving out the *specific norms* likely to be connected to intergroup interaction has become obvious. In my analyses, this has been reflected in the observation that indicators of specific religious norms were consistently more predictive of (gendered) patterns of friendship-making than broader measures of religiosity. This limited explanatory power of broad measurements of religiosity is also mirrored in recent social network research. For example, while recent studies find clear evidence of segregation between Muslim and non-Muslim youth, they detect little additional variation according to traditional measures of religiosity (Leszczensky & Pink 2017, 2020). This book suggests that one likely reason for observations like these is that religiosity affects friendship-making in more nuanced ways, and that specific religious norms rather than religiosity more broadly should be considered to capture these nuanced effects.

At the same time, this book has highlighted the need for nuance in terms of *who* religious norms apply to. In particular, the findings on interreligious contact have demonstrated highly gendered norms and patterns of friendship-making. To understand the impact of religion and religiosity on intergroup contact, it is thus important to not only consider specific norms, but also the specific group of people these norms target. While I have primarily focused on variation by gender in this book, the more general lesson is that a differentiated analysis of specific religious norms and their applicability to different people is key to understanding the role religion and religiosity play for friendship-making—and, most likely, beyond it.

7.3 A Look Ahead: Four Key Questions for Future Research

In demonstrating the importance of gender-related norms for Muslim youths' friendship-making, this book also raises a number of follow-up questions. In the following, I highlight four key questions for future research.

When and Why is Non-Muslims' Reluctance towards Muslim Youth Gendered?

To appropriately capture the consequences of gendered endogamy norms for Muslim youths' gendered interreligious friendship-making, the first part of this book also asked whether non-Muslims differ in their openness to Muslim boys and girls. However, my findings on this question were less conclusive than those concerning gendered friendship-making among Muslim youth themselves. Specifically, Chapter 2 found non-Muslims to be reluctant particularly towards friendships with Muslim boys, not girls, but, using different data, Chapter 3 suggested non-Muslims' reluctance towards Muslim boys and girls to be similar.

While I could not resolve this inconsistency within the limits of this book, I concluded Chapter 3 by pointing to potential explanations that refer to differences in the types of schools and levels of diversity characterizing the data analyzed in the two chapters. These and other potential explanations need to be submitted to rigorous empirical testing in future research.

It may, however, be beneficial to first obtain an answer to the more fundamental question of *why* non-Muslims may be reluctant towards Muslim boys on the one hand and Muslim girls on the other. I have suggested that a key source of (gendered) reluctance may be gender-specific stereotypes, in particular stereotypes that provide a very negative depiction of male Muslims (Archer 2009; Erentzen et al. 2022; Fourgassie et al. 2023). So far, however, the accumulating evidence on these stereotypes mainly refers to Muslim *adults*. Accordingly, a key task for future research is to establish whether these stereotypes, as well as those targeted at female Muslims, also apply to Muslim youth, and how exactly they are connected to non-Muslims' openness to friendship-making.

At the same time, the very real risk of gendered stereotypes must not distract from the possibility that Muslim and non-Muslim youth may also differ in some of their actual attitudes and behaviors, and that these differences can hamper friendship-making as well. To give only two examples, Chapter 6 has highlighted that Muslim boys hold more traditional gender role attitudes than both Muslim girls and non-Muslims, and Chapter 4 has shown that, over time, Muslim girls cut back notably on the leisure time they spend in clubs or youth centers in adolescence. These and other differences can factor into non-Muslim youths' considerations on friendship-making, resulting in gender-specific barriers to friendships with Muslim peers. To understand why non-Muslims are reluctant to form friendships with Muslim boys and girls, future research should therefore study both the gendered stereotypes non-Muslims hold about Muslim boys and girls and actual group differences. Carving out these mechanisms is likely to also provide insights into the scope conditions of

reluctance and therefore help to explain the divergent findings on non-Muslims' reluctance towards boys and girls documented in this book.

Whose Norms Matter Where? Friendship-Making and the Norms of Youth, Parents, and Religious Communities

While this book suggests *that* gender-related religious norms interfere with Muslim youths' friendship-making, it does not provide a final verdict on *whose* norms are most decisive. Thinking about potential originators of normative influence, youths' own norms are most directly connected to friendship-making. However, control and regulations by parents, as well as by the religious community more broadly, can also shape social relationships (Hawkey et al. 2018; Hennink et al. 1999; Mir 2009).

My findings indicated that both youths' own and their parents' norms are relevant for friendship-making, though evidence on their relative contribution to friendship-making differed between interreligious and cross-gender friendships. In the analysis of cross-gender friendships, youths' own chastity norms fully explained the gap in friendship-making between Muslims and their non-Muslim peers, and there was no evidence of parental influence beyond the intergenerational transmission of norms. In the analysis of interreligious friendships, (perceived) parental norms were more clearly predictive of in-group friendship-making, though separating the influence of adolescents' and parents' norms proved challenging due to their strong correlation.

In both cases, however, there were limitations to fully capturing the influence of parental norms. In the analysis of endogamy norms, parental influence was assessed by youths' perceptions of their parents' norms and control, and perceptions and reality may differ. In the analysis of chastity norms, I could instead rely on a direct measurement of parental norms, but it only captured the attitudes of one parent, most frequently the mother. This can be a constraint particularly in the analysis of norms on romance and sexuality, as qualitative evidence suggests that, more than mothers, fathers are responsible for the regulation of cross-gender interaction (e.g., Hawkey et al. 2018; Saharso et al. 2023). More thoroughly capturing parental normative influence and comparing it to the impact of adolescents' own norms thus remains a task for future research.

This book also says little about the role of broader *religious community norms*. This neglect does not reflect substantive reasons, but the fact that corresponding information is hardly available in the large-scale social network survey data needed to establish patterns of friendship-making among Muslim youth systematically. Given the complexities of surveying entire communities, this lack of data is only natural. However, one insight from qualitative approaches to the

documentation of norm influence is that fine-grained community data may not even be necessary to understand community impact on adolescent social behaviors. Many Muslim youth indicate that they are highly uncertain about which actual expectations and norms prevail within the religious community (Hennink et al. 1999; Mir 2009). Under conditions like these, it is mostly adolescents' perceptions of community norms and the worst-case scenarios they imagine to be associated with close cross-gender or interreligious contact that are decisive for their friendship-making. These perceptions of community norms among adolescents can be surveyed more easily.

Questions on the influence of youths' own, their parents' and their communities' norms intensify further when considering adolescents' friendships *beyond the school context*. Within Western schools, Muslim youth do not only have ample opportunities for interreligious and cross-gender interaction, but immediate parental and community supervision of their intergroup contact is also limited. Even if parents or the community disapprove, interreligious and cross-gender friendship-making thus is in principle possible. Accordingly, adolescents' own norms are likely to be particularly decisive in the school context, while parental and community control may dominate more clearly outside of school. Differentiating the impact of the different sources of norms thus also requires a consideration of the various contexts Muslim youth engage in. An assessment like this is necessarily difficult, as different contexts of friendship formation not only come with different sources of normative influence, but also with different opportunities for intergroup contact (Mollenhorst et al. 2008; Scourfield et al. 2013). At the same time, understanding friendship-making across different contexts is important to gauge the full extent of Muslim youths' gender and religious segregation, and therefore an important avenue of future research.

Do Gender-Related Norms Also Shape Weak Relations and Intergroup Attitudes?

In this book, I have investigated the consequences gender-related norms have for the *friendships* of Muslim youth. Besides romantic relationships, friendships are adolescents' closest non-kin relationships, and, as discussed above, lack of close interreligious and cross-gender friendships is likely to have consequences for both intergroup relations and minority integration. However, friendships and romantic relationships are not the only relationships youth engage in, raising the question of whether gender-related norms also affect other types of relationships. Answering this question in future research could provide further information

on both group boundaries and the consequences of limited interreligious and cross-gender friendships more generally.

In particular, an important open question is whether norms also constrain relationships that are *weaker* than friendships, but still *positively* connotated. For example, acquaintanceship or school-based collaboration ties may, even though they are less intimate than friendships, still provide some of the benefits interreligious and cross-gender friendships come with. In the literature on young Muslims' cross-gender interaction, some qualitative studies suggest that Muslim youth consider cross-gender interaction unproblematic if it is clearly oriented towards a common goal, such as jointly preparing for an exam. It is only when interaction becomes an end in itself that some Muslim youth start to worry that romantic interest may become an issue and abstain from closer interaction (Maddanu 2016; Mir 2009; Zine 2008). In a similar vein, some Muslim parents do not oppose their children's interreligious contact in the school context, but structure activities in a way that complicates further intensification of these contacts outside of school (Scourfield et al. 2013; Karam 2020). Accordingly, endogamy and chastity norms may less strongly complicate relationships that are weaker than friendships, though this has not been systematically established yet. Understanding the link between norms and these weaker relationships is important for various reasons. First, though intergroup friendships most strongly support intergroup attitudes, weaker contact is beneficial as well (Pettigrew & Tropp 2006). Second, weak interreligious ties may also suffice to combat Muslim youths' information deficits on the educational system and labor market, just as weak cross-gender ties may help to get a better perspective on the other gender. Finally, if gender-related norms do not shape acquaintanceship and collaboration ties, this further supports the idea that the restrictions norms impose on friendships reflect the risk of romantic relationships inherent in friendships specifically rather than a conflictual group boundary more generally.

Obtaining a more direct understanding of how gender-related norms affect *group boundaries and intergroup attitudes* is desirable as well. In this book, I have concentrated on friendships, and as we know from the literature, the prevalence of intergroup friendships is frequently reflective of intergroup attitudes (Binder et al. 2009; Pettigrew et al. 2011). In the discussion above, however, I have suggested that this link between attitudes and friendship-making may break in the face of strong norm influence: Norms can constrain friendship-making, but do not necessarily worsen intergroup attitudes. At the same time, I highlighted that, even if a norm-induced lack of intergroup friendships does not affect intergroup attitudes in the short run, there is a risk of this link emerging in the long run. After all, intergroup friendships tend to dismantle stereotypes and prejudice, and this process may slow down or come to a halt if intergroup

friendships are rare. Given these competing expectations for the short and for the long run, understanding the contribution of gender-related norms to boundaries between both Muslims and non-Muslims and between boys and girls suggests the need for a long-term assessment of intergroup attitudes.

Beyond Western Muslims? Understanding the Generality of Patterns and Mechanisms

All the substantive research reported in this book has been concerned with young Muslims and their friendship-making in Western societies. Other ethno-religious minorities have only surfaced sporadically, and none of the empirical analyses spoke to their friendship-making specifically.

There were good reasons to, throughout this book, focus on Western Muslims. By a substantial margin, Muslims are the largest religious minority in Western Europe (Pew Research Center 2017). They are also at the center of most debates surrounding the issues of religion, religiosity, and gender (Choi et al. 2023; Sniderman & Hagendoorn 2009) and research suggests a bright boundary particularly between the Western majority and Muslims (Drouhot & Nee 2019; Foner & Alba 2018). Throughout this book, I have also highlighted that there are regulations specific to Muslim communities that can constrain interreligious and cross-gender relations. This holds for endogamy norms, which are highly gendered, based on interpretations of the Qur'an that prohibit intermarriage for women but not for men (Clycq 2012; Cila & Lalonde 2014). It also holds for chastity norms, which are more closely related to practices of gender segregation among Muslims than in other religious communities (Beekers & Schrijvers 2020; Williams et al. 2017).

However, these reasons for focusing on Western Muslims must not distract from the fact that many of the arguments raised and expectations formulated throughout this book also apply to ethno-religious minorities more generally. Norms on religious endogamy prevail among devout followers of most major religions, and the gendering of these norms is not specific to Muslims either (Hanassab 1998; Hennink et al. 1999; Talbani & Hasanali 2000). While there may be no explicit prohibition of intermarriage in other religious groups, the ascription of the responsibility for cultural continuity to women means that interreligious romance for girls is seen more critically than for boys across religions (Dion & Dion 2001; Munniksma et al. 2012).

Strong and gendered chastity norms also transcend religious boundaries and are well-documented both among ethno-religious minorities and devout Christians in the West (Beekers & Schrijvers 2020; Hawkey et al. 2018; Hennink et al. 1999; Saharso et al. 2023). Though these norms are most closely connected

to a segregation of the genders among Muslims (Beekers & Schrijvers 2020; Velayati 2016; Williams et al. 2017), reservations to cross-gender interaction due to strong chastity norms have also been reported for, amongst others, Orthodox Christians, Hindus, and Sikhs (Hawkey et al. 2018; Hennink et al. 1999; Saharso et al. 2023; Talbani & Hasanali 2000). These reservations also do not only have to reflect strict interpretations of chastity norms. Instead, restrictions to cross-gender interaction can also originate from more general concerns about the very liberal attitudes on issues of sexuality that the secular Western majority tends to holds (Beekers & Schrijvers 2020; Le Espiritu 2001). A fear that these attitudes may spread and result in a lifestyle perceived as overly promiscuous can be a further reason for ethno-religious minorities to restrict both cross-gender interaction and close contact with the secular majority.

Given these considerations, it is important that future research goes beyond assessing gender-related religious norms and friendship-making among Western Muslims only. Broadening the perspective to other ethno-religious groups, as well as the minority of devout Western Christians, can help to better understand both the group-specifics and the universalities of the processes discussed throughout this book. Therefore, this broader approach will allow us to learn more about the patterns of adolescents' friendship-making we can expect in increasingly diverse Western societies.

Appendix A

Appendix to Chapter 2

A.1 Selectivity of the Network Sample

The German CILS4EU data consists of 5,013 students nested in 271 classroom networks. The sample for the network analysis consists of 3,194 students nested in 149 classrooms. Networks had to be excluded from the analysis for two reasons:

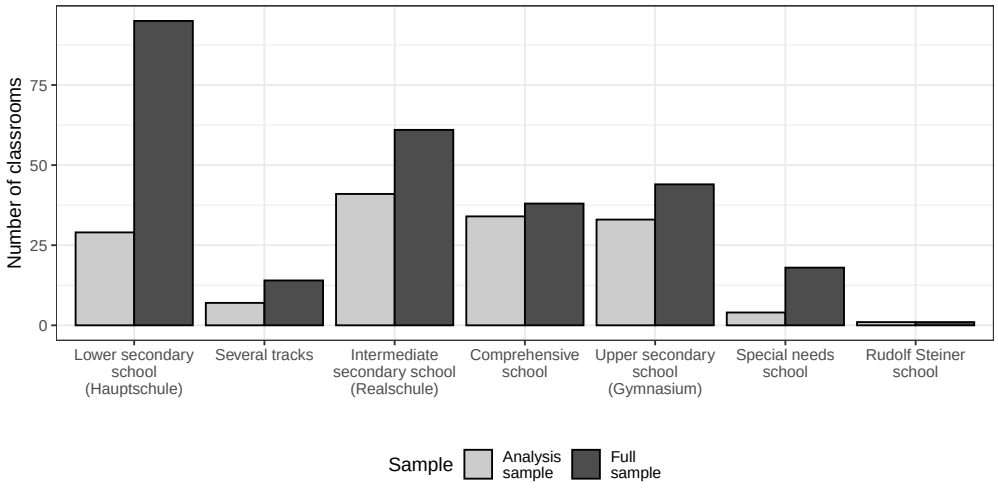
1. *Lack of longitudinal information*: Some classroom networks were only collected in the first wave. This largely affects Hauptschulen (lower secondary schools), which frequently end after grade 9, the grade in which adolescents were sampled in the first wave (Kruse et al. 2016). In some of these schools, schooling continues after grade 9; for students from these schools, longitudinal network data is available and they thus are part of the final network sample.

2. *Large share of students who did not participate in the CILS4EU sociometric module*: I excluded networks in which more than 50% of students did not participate in at least one of the waves of the network data collection, because high levels of non-response at the actor level can introduce biases (Huisman & Steglich 2008).

Since the lack of longitudinal network information is the primary reason for networks missing from the analysis sample, the analysis sample is selective in terms of school types. As can be seen in Figure A.1, lower secondary schools (*Hauptschulen*) are underrepresented relative to their presence in the full CILS4EU sample. Intermediate secondary schools (*Realschulen*), comprehensive schools, and upper secondary schools (*Gymnasien*), however, are appropriately represented in the analysis sample.

I checked whether the analysis sample is also selective with respect to gender and religious composition as well as social background—i.e., those student characteristics that are part of the analyses. As I show in more detail below, this

Figure A.1: Distribution of Classrooms across School Types in the Full CILS4EU and the Analysis Sample



is not the case and I am thus confident that the analysis sample is not biased with regard to these characteristics.

Figure A.2 shows the distribution of demographic characteristics in the networks in the analysis sample as compared to the overall CILS4EU sample. As visible in Figure A.2, the classrooms in the analysis sample and the overall CILS4EU sample at most show minor differences in terms of all characteristics. Figure A.3 further splits the analysis by school types,[1] showing that, conditional on school type, even the small differences between the full sample and the analysis sample in terms of occupational status or the total number of students disappear.

Given that the study is primarily interested in the interaction of religion and gender, Figure A.4 displays gender composition separately for Muslim and non-Muslim adolescents for the full CIL4EU sample and the analysis sample. The full sample and the analysis sample do not differ substantially for either Muslim or non-Muslim youth. Finally, Figure A.5 displays religious composition separately by gender. Religious composition hardly varies between the full CILS4EU sample and the analysis sample among either boys or girls. Therefore, the analysis sample does not seem to be selective for any of the key variables of the study.

[1] I only provide an analysis split by school types for the school types I observe sufficiently many classrooms for, i.e., lower secondary schools (*Hauptschulen*), intermediate secondary schools (*Realschulen*), comprehensive schools, and upper secondary schools (*Gymnasien*).

Figure A.2: Distribution of Demographics in the Full CILS4EU and the Analysis Sample Classrooms

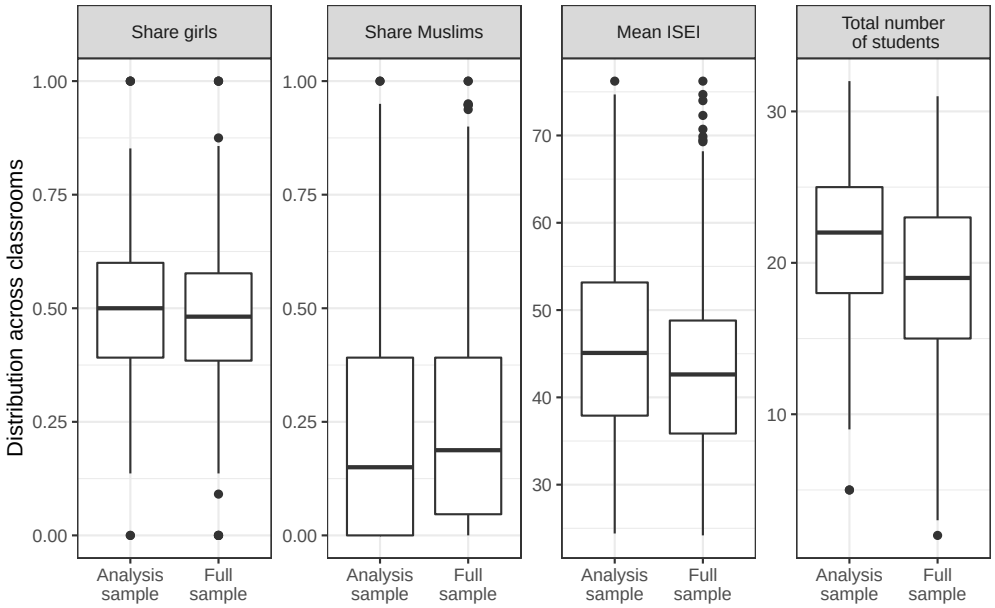


Figure A.3: Distribution of Demographics in the Full CILS4EU and the Analysis Sample Classrooms, by School Type

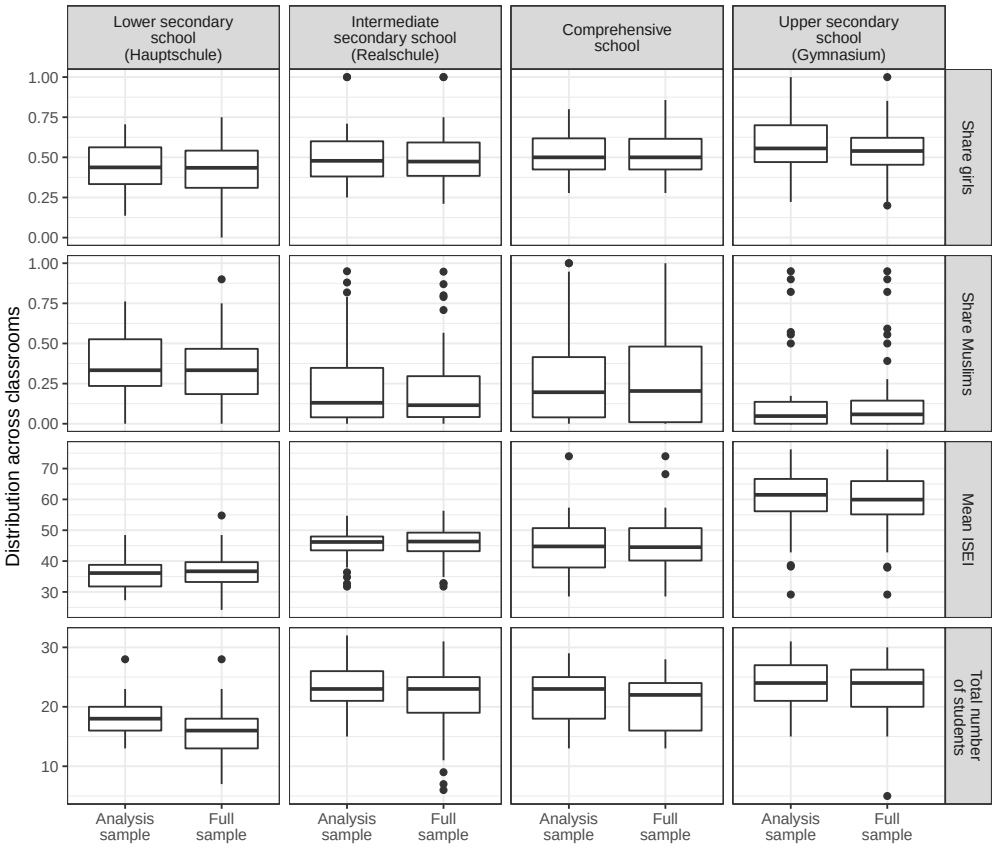


Figure A.4: Distribution of Gender Composition in the Full CILS4EU and the Analysis Sample Classrooms, by Religious Affiliation

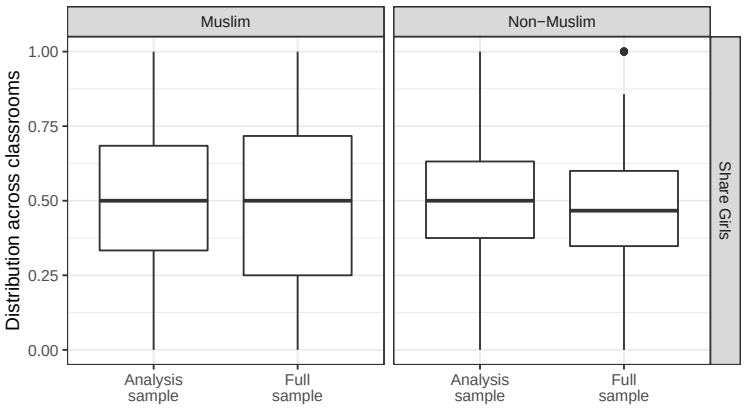


Figure A.5: Distribution of Religious Composition in the Full CILS4EU and the Analysis Sample Classrooms, by Gender

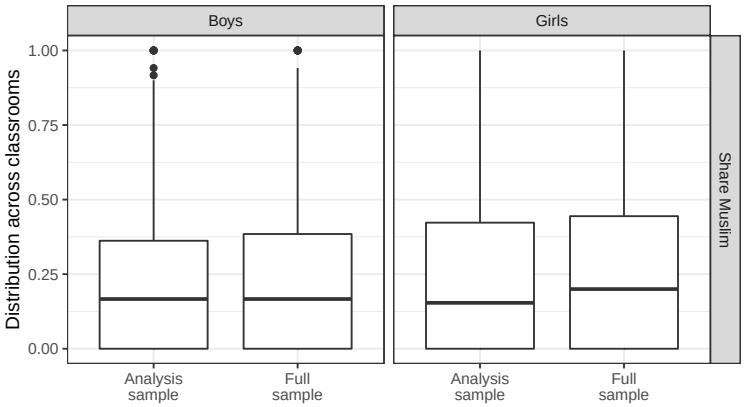
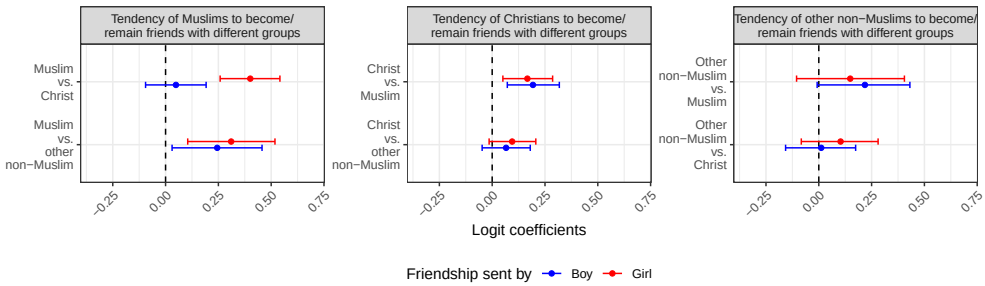


Figure A.6: Tendency of Muslim, Christian, and Other Non-Muslim Girls and Boys to Become/Remain Friends with Muslims, Christians, and Other Non-Muslims



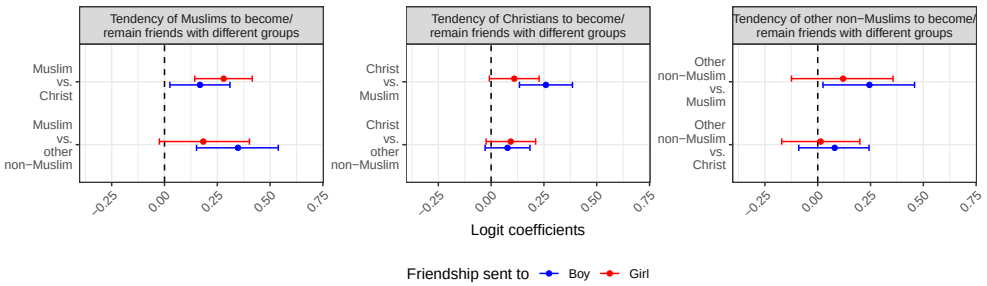
A.2 Robustness Checks

Throughout the main text, the analyses differentiate between Muslim and non-Muslim youth. Here I provide an extended analysis that further splits non-Muslim youth, considering Christians (the largest religious group in Germany) and other non-Muslim youth, the latter category capturing those without any or with another religious affiliation. In these analyses, I check whether the dynamics I observe in the main text also hold when contrasting the religious majority of Christians with the minority of Muslims; I also assess whether there are (gendered) religious boundaries between Christians and other non-Muslims, rather than only boundaries to Muslim youth.

When running these more differentiated analyses, I cannot estimate the full model from the main text analysis (shown in Table A.2 below) because this model does not converge for a three-group scenario. Instead, I split the analysis into two models, the first only differentiating by the *sender's* gender (like Table A.1 below), asking whether boys and girls form relationships to different groups differently. The second model then only differentiates by the *receiver's* gender, asking whether the relationships sent to boys and girls differ. The main results for the model differentiating according to the sender's gender are shown in Figure A.6.

In Figure A.6 we see gender differences in friendship formation among Muslims that are similar to those reported in the main text, in particular concerning relationships to Christians. Muslim girls have a strong tendency to become and remain friends with other Muslims rather than Christians, while Muslim boys are largely indifferent. For relationships to other non-Muslims, differences between Muslim boys and girls are weaker. Among other groups, I do not observe notable (sender) gender differences in friendship formation, in accordance with findings from the main text. Figure A.6 also shows that religious boundaries between Christians and other non-Muslims are much weaker than boundaries

Figure A.7: Tendency of Muslim, Christian, and Other Non-Muslim Youth to Become/Remain Friends with Muslim, Christian, and Other Non-Muslim Boys and Girls.



relating to Muslims. Christians show no clear tendency to prefer Christians over other non-Muslims (but prefer them over Muslims). The same holds true for other non-Muslims, who also show no weaker tendency to become and remain friends with Christians than with other non-Muslims.

In Figure A.7, which shows whether Muslim, Christian, and other non-Muslim youth differ in the relationships they send to boys and girls, I also do not observe religious boundaries between Christians and other non-Muslims, neither concerning boys nor girls. By contrast, I do observe a reluctance to be friends with Muslim boys, but less so Muslim girls, among both Christians and other non-Muslim youth, suggesting that non-Muslim youth are reluctant to be friends with Muslim boys more generally. Therefore, these more differentiated analyses replicate the findings from the main text and suggest that, for the purposes at hand, collapsing Christian and other non-Muslim youth into one group is justified because of the weak religious boundaries between these groups and the strong boundaries in relation to Muslim youth.

A.3 Technical Information on Multilevel SAOMs

My main analyses rely on Bayesian random-coefficients multilevel stochastic actor-oriented models (SAOM; Koskinen & Snijders 2023; Ripley et al. 2023). Like in all Bayesian analyses, priors have to be specified for the parameters in the models and, as parameters are estimated using Markov Chain Monte Carlo methods (MCMC), convergence of the estimation process has to be assessed on the basis of the MCMC sequences. I discuss both of these specifics of the estimation approach below.

A.3.1 Specifying Priors for the Parameters

In the Bayesian multilevel SAOM, priors have to be explicitly specified for random parameters, i.e., the parameters that are allowed to vary across networks. For fixed parameters, flat improper priors are used by default, and priors are largely irrelevant for posterior estimates because fixed parameters are estimated across all networks and thus based on sufficient data to trump prior information. For random parameters, by contrast, normally distributed priors are implemented in the RSiena software. In specifying these priors, I stick to the suggestions provided by the developers (Koskinen & Snijders 2023; Ripley et al. 2023). By default, they suggest to use prior means of 0 and prior variances of .01 (standard deviations of .1) if no clear-cut information on the expected sign and size of the parameters is available. Prior means of 0 mean that estimates are not a priori skewed in either direction, and standard deviations of .1 reflect realistic amounts of variation in estimates across networks according to previous research (Ripley et al. 2023). In line with the recommendations, I only deviate from this general guideline for two parameters which I have more clear-cut expectations for: the outdegree and the reciprocity parameters (Ripley et al. 2023). For the reciprocity parameter, I specify a prior mean of 1.5 because of the strong reciprocity effects frequently observed in the literature (Snijders et al. 2010). For the outdegree parameter, I specify a prior mean of -1 and a prior variance of .1 (rather than .01), because the outdegree effect is known to vary more widely between networks and is usually negative in friendship networks. (Note that the network models in Table A.1 and A.2 surprisingly suggest a positive outdegree effect. However, follow-up analyses showed that the positive outdegree effect is a consequence of the strong and negative outdegree-activity effect in the models; when excluding the outdegree-activity effect, the outdegree effect takes on the negative values usually observed in the analysis of friendship networks.) In any case, given the large number of networks included in the

analysis, the impact of the specified priors is expected to be small even for random effects (Ripley et al. 2023)

A.3.2 Assessing Convergence

As noted above, Bayesian multilevel SAOM are based on an iterative estimation process using MCMC methods. As suggested by the developers, I assessed convergence of the estimation process in two ways (Ripley et al. 2023). First, for all of the parameters, I graphically inspected the evolution of parameter estimates along the iterations of the MCMC sequences with trace lines to ensure that parameter estimates converge towards stable values across iterations (Boda 2018; Ripley et al. 2023). Second, I estimated all models multiple times with independent starting points and then assessed convergence with information on a) $\widehat{R}$, which indicates the potential scale reduction of the posterior distribution if simulations were continued indefinitely, and b) the effective sample size n_{eff}, the estimated equivalent sample size under independent sampling (Ripley et al. 2023). For all models and all parameters, the trace lines indicate good convergence, as do values of $\widehat{R} < 1.1$ and of $n_{\text{eff}} > 5 \times n_{chains}$ (according to the rules of thumb by Gelman et al. (2004)). All these analyses thus suggest that the models are well-converged.

A.4 Full Model Results from SAOM Analysis

Table A.1: Full Model Results for the Tendency of Muslim and Non-Muslim Girls and Boys to Become/Remain Friends with Muslims and Non-Muslims

	Posterior mean (SD)		Credible interval Lower	Credible interval Upper	
Structural network effects					
Outdegree	0.30*	(0.14)	0.03	0.57	RE
Reciprocity	2.12***	(0.07)	1.99	2.25	RE
Transitive closure (GWESP)	1.66***	(0.04)	1.59	1.74	RE
Reciprocity x Transitive closure (GWESP)	−0.62***	(0.06)	−0.73	−0.52	RE
Indegree-popularity (sqrt)	−0.19***	(0.04)	−0.27	−0.12	RE
Indegree-activity (sqrt)	−0.31***	(0.03)	−0.38	−0.24	RE
Outdegree-activity (sqrt)	−0.67***	(0.04)	−0.75	−0.58	RE
Covariate control effects					
Same country of origin	0.06*	(0.02)	0.01	0.10	FE
Max. parental ISEI alter	0.01*	(0.01)	0.00	0.03	FE
Max. parental ISEI ego	−0.01*	(0.01)	−0.03	0.00	FE
Max. parental ISEI similarity	0.02	(0.05)	−0.09	0.12	FE
Gendered in-group bias and reluctance					
Muslim alter	−0.19***	(0.05)	−0.29	−0.08	FE
Muslim ego	−0.09	(0.06)	−0.20	0.02	FE
Muslim ego x Muslim alter	0.28***	(0.08)	0.12	0.45	FE
Girl alter	−0.23***	(0.03)	−0.30	−0.16	FE
Girl ego	−0.41***	(0.04)	−0.49	−0.33	FE
Girl ego x Girl alter	0.56***	(0.05)	0.47	0.66	FE
Girl ego x Muslim ego	−0.09	(0.07)	−0.23	0.06	FE
Girl ego x Muslim alter	0.05	(0.07)	−0.08	0.19	FE
Girl ego x Muslim ego x Muslim alter	0.22*	(0.11)	0.00	0.44	FE

Note: $^{\dagger}p < .10$,$^{*}p < .05$,$^{**}p < .01$,$^{***}p < .001$; two-tailed tests. Posterior means, standard deviations of posterior means, and credible intervals are Bayesian analogs to point estimates, standard errors, and confidence intervals. All covariates are centered. RE indicates random effects and FE indicates fixed effects.

Table A.2: Full Model Results for the Tendency of Muslim and Non-Muslim Girls and Boys to Become/Remain Friends with Muslim and Non-Muslim Girls and Boys

	Posterior mean (SD)		Credible interval Lower	Upper	
Structural network effects					
Outdegree	0.31^{*}	(0.14)	0.03	0.59	RE
Reciprocity	2.11^{***}	(0.07)	1.98	2.25	RE
Transitive closure (GWESP)	1.66^{***}	(0.04)	1.59	1.74	RE
Reciprocity x Transitive closure (GWESP)	-0.62^{***}	(0.06)	-0.73	-0.51	RE
Indegree-popularity (sqrt)	-0.19^{***}	(0.04)	-0.28	-0.11	RE
Indegree-activity (sqrt)	-0.31^{***}	(0.04)	-0.38	-0.24	RE
Outdegree-activity (sqrt)	-0.67^{***}	(0.04)	-0.76	-0.58	RE
Covariate control effects					
Same country of origin	0.06^{*}	(0.02)	0.01	0.10	FE
Max. parental ISEI alter	0.01^{*}	(0.01)	0.00	0.03	FE
Max. parental ISEI ego	-0.01	(0.01)	-0.03	0.00	FE
Max. parental ISEI similarity	0.02	(0.06)	-0.09	0.13	FE
Gendered in-group bias and reluctance					
Muslim alter	-0.21^{***}	(0.06)	-0.33	-0.10	FE
Muslim ego	-0.08	(0.06)	-0.21	0.04	FE
Muslim ego x Muslim alter	0.31^{**}	(0.09)	0.12	0.49	FE
Girl alter	-0.24^{***}	(0.04)	-0.32	-0.16	FE
Girl ego	-0.38^{***}	(0.04)	-0.47	-0.30	FE
Girl ego x Girl alter	0.54^{***}	(0.06)	0.42	0.66	FE
Girl ego x Muslim ego	-0.37^{**}	(0.14)	-0.64	-0.12	FE
Girl ego x Muslim alter	-0.16	(0.13)	-0.42	0.10	FE
Girl ego x Muslim ego x Muslim alter	0.78^{***}	(0.21)	0.39	1.19	FE
Girl alter x Muslim ego	0.01	(0.12)	-0.21	0.24	FE
Girl alter x Muslim alter	0.13	(0.12)	-0.11	0.36	FE
Girl alter x Muslim ego x Muslim alter	-0.16	(0.19)	-0.51	0.21	FE
Girl ego x Girl alter x Muslim ego	0.33	(0.18)	0.00	0.69	FE
Girl ego x Girl alter x Muslim alter	0.15	(0.18)	-0.21	0.50	FE
Girl ego x Girl alter x Muslim ego x Muslim alter	-0.55^{*}	(0.26)	-1.06	-0.03	FE

Note: $^{\dagger}p < .10$,* $p < .05$,** $p < .01$,*** $p < .001$; two-tailed tests. Posterior means, standard deviations of posterior means, and credible intervals are Bayesian analogs to point estimates, standard errors, and confidence intervals. All covariates are centered. RE indicates random effects and FE indicates fixed effects.

Appendix B

Appendix to Chapter 3

B.1 Details on SAOM Sample

Table B.1: Overview of the Sample for the SAOM analysis

			Average Outdegree in Wave				
Network	# Students	# Classes	1	2	3	4	5
1	70	2	6.18	7.22	6.63	5.59	5.14
2	82	3	5.66	5.20	5.28	4.28	4.89
3	122	4	6.15	7.42	6.62	6.22	6.18
4	151	5	6.83	6.70	6.64	6.40	6.24
5	128	4	7.06	7.25	6.70	6.12	6.02
6	136	4	6.76	6.69	5.75	6.00	6.40
7	72	2	5.19	5.03	5.62	5.62	5.17
8	66	2	5.76	4.89	4.63	4.30	3.91
9	133	4	6.26	6.01	6.22	5.94	6.19
10	126	4	6.95	6.63	6.13	5.46	6.14
11	126	4	6.48	5.72	6.04	5.83	5.35

B.2 Full Model Results from SAOM Analysis

Table B.2: Full Model Results for Static SAOM Meta-Analysis of Gendered Muslim In-Group Bias and Non-Muslim Reluctance

	Estimate	SE
Rates		
Rate Period 1	18.245***	(2.317)
Rate Period 2	17.101***	(1.563)
Rate Period 3	16.554***	(1.191)
Rate Period 4	12.348***	(1.216)
Structural network effects		
Outdegree	−1.402***	(0.197)
Reciprocity	2.580***	(0.107)
GWESP	1.710***	(0.059)
Reciprocity x GWESP	−1.043***	(0.072)
Indegree-popularity (sqrt)	−0.242***	(0.038)
Indegree-activity (sqrt)	−0.720***	(0.060)
Outdegree-activity (sqrt)	0.219***	(0.037)
Covariate control effects		
Same neighborhood	0.052	(0.047)
Same elementary school	0.086†	(0.033)
Same classroom	0.072	(0.046)
Same ethnic background	0.001†	(0.001)
Parental occupational status alter	0.000	(0.001)
Parental occupational status ego	0.155*	(0.072)
Similar parental occupational status	0.438***	(0.037)
Gender-specific in-group bias and reluctance		
Girl alter	−0.301***	(0.041)
Girl ego	−0.358***	(0.068)
Girl ego x Girl alter	0.677***	(0.081)
Muslim alter	−0.218**	(0.069)
Muslim ego	−0.120	(0.083)
Muslim ego x Muslim alter	0.600***	(0.086)
Girl ego x Muslim ego	−0.128†	(0.075)
Girl ego x Muslim alter	−0.029	(0.066)
Girl ego x Muslim ego x Muslim alter	−0.009	(0.086)

Note: $^{\dagger}p < .10$,$^{*}p < .05$,$^{**}p < .01$,$^{***}p < .001$. Results from REML meta-analysis based on 11 grade-level networks. Coefficients and standard errors (SE).

Table B.3: Full Model Results for Static SAOM Meta-Analysis of Gendered Muslim In-Group Bias and Non-Muslim Reluctance in Friendships with Boys and Girls

	Estimate	SE
Rates		
Rate Period 1	18.852***	(1.859)
Rate Period 2	17.775***	(1.442)
Rate Period 3	15.644***	(1.372)
Rate Period 4	12.508***	(1.514)
Structural network effects		
Outdegree	−1.506***	(0.220)
Reciprocity	2.504***	(0.109)
GWESP	1.657***	(0.060)
Reciprocity x GWESP	−0.997***	(0.085)
Indegree-popularity (sqrt)	−0.234***	(0.052)
Indegree-activity (sqrt)	−0.749***	(0.069)
Outdegree-activity (sqrt)	0.259***	(0.042)
Covariate control effects		
Same neighborhood	−0.013	(0.039)
Same elementary school	0.107**	(0.036)
Same classroom	0.468***	(0.049)
Same ethnic background	0.088†	(0.048)
Parental occupational status alter	0.002†	(0.001)
Parental occupational status ego	0.000	(0.002)
Similar parental occupational status	0.178†	(0.095)
Gender-specific in-group bias and reluctance		
Girl alter	−0.266***	(0.065)
Girl ego	−0.323***	(0.093)
Girl ego x Girl alter	0.647***	(0.113)
Muslim alter	−0.143	(0.105)
Muslim ego	−0.095	(0.100)
Muslim ego x Muslim alter	0.668***	(0.108)
Girl ego x Muslim ego	−0.342*	(0.174)
Girl ego x Muslim alter	−0.192	(0.137)
Girl ego x Muslim ego x Muslim alter	0.141	(0.184)
Girl alter x Muslim ego	−0.003	(0.139)
Girl alter x Muslim alter	−0.118	(0.132)
Girl alter x Muslim ego x Muslim alter	−0.171	(0.246)
Girl ego x Girl alter x Muslim ego	0.213	(0.173)
Girl ego x Girl alter x Muslim alter	0.159	(0.182)
Girl ego x Girl alter x Muslim ego x Muslim alter	−0.037	(0.259)

Note: $^{\dagger}p < .10$,$^{*}p < .05$,$^{**}p < .01$,$^{***}p < .001$. Results from REML meta-analysis based on 8 grade-level networks. Coefficients and standard errors (SE).

Table B.4: Full Model Results for Dynamic SAOM Meta-Analysis of Gendered Muslim In-Group Bias and Non-Muslim Reluctance

	Estimate	SE
Rates		
Rate Period 1	18.443***	(2.447)
Rate Period 2	17.278***	(1.590)
Rate Period 3	16.555***	(1.161)
Rate Period 4	12.427***	(1.230)
Structural network effects		
Outdegree	−1.360***	(0.217)
Reciprocity	2.566***	(0.107)
GWESP	1.698***	(0.059)
Reciprocity x GWESP	−1.025***	(0.072)
Indegree-popularity (sqrt)	−0.241***	(0.038)
Indegree-activity (sqrt)	−0.713***	(0.056)
Outdegree-activity (sqrt)	0.210***	(0.037)
Covariate control effects		
Same neighborhood	0.045	(0.048)
Same elementary school	0.083*	(0.032)
Same classroom	0.449***	(0.037)
Same ethnic background	0.063	(0.048)
Parental occupational status alter	0.001	(0.001)
Parental occupational status ego	−0.001	(0.001)
Similar parental occupational status	0.127†	(0.076)
Age- and gender-specific in-group bias and reluctance		
Age ego	0.002	(0.025)
Girl alter	−0.310***	(0.044)
Girl ego	−0.335***	(0.084)
Girl ego x Girl alter	0.682***	(0.084)
Muslim alter	−0.228**	(0.081)
Muslim ego	−0.115†	(0.068)
Muslim ego x Muslim alter	0.694***	(0.133)
Girl ego x Muslim ego	−0.015	(0.099)
Girl ego x Muslim alter	−0.029	(0.071)
Girl ego x Muslim ego x Muslim alter	−0.225	(0.154)
Age ego x Muslim ego	0.015	(0.055)
Age ego x Muslim alter	−0.010	(0.051)
Age ego x Muslim ego x Muslim alter	−0.031	(0.088)
Age ego x Girl ego	−0.005	(0.032)

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Table B.4 *continued from previous page*

	Estimate	SE
Age ego x Girl ego x Muslim ego	$-0.140^{\dagger}$	(0.081)
Age ego x Girl ego x Muslim alter	0.020	(0.067)
Age ego x Girl ego x Muslim ego x Muslim alter	0.155	(0.129)

Note: $^{\dagger}p < .10$,$^{*}p < .05$,$^{**}p < .01$,$^{***}p < .001$. Results from REML meta-analysis based on 11 grade-level networks. Coefficients and standard errors (SE). Student age is recoded so age 13 is the reference category, i.e., takes a value of zero in the analysis. Thus, age is $+1$ for 14-year-old students and -1 for twelve-year-old students.

Table B.5: Full Model Results for Dynamic SAOM Meta-Analysis of Gendered Muslim In-Group Bias and Non-Muslim Reluctance in Friendships with Boys and Girls

	Estimate	SE
Rates		
Rate Period 1	18.520***	(1.845)
Rate Period 2	17.795***	(1.438)
Rate Period 3	15.575***	(1.337)
Rate Period 4	12.391***	(1.488)
Structural network effects		
Outdegree	−1.416***	(0.246)
Reciprocity	2.510***	(0.109)
GWESP	1.654***	(0.061)
Reciprocity x GWESP	−0.999***	(0.084)
Indegree-popularity (sqrt)	−0.231***	(0.054)
Indegree-activity (sqrt)	−0.753***	(0.069)
Outdegree-activity (sqrt)	0.251***	(0.041)
Covariate control effects		
Same neighborhood	−0.017	(0.042)
Same elementary school	0.104**	(0.036)
Same classroom	0.477***	(0.051)
Same ethnic background	0.084†	(0.048)
Parental occupational status alter	0.002	(0.001)
Parental occupational status ego	0.000	(0.002)
Similar parental occupational status	0.165†	(0.098)
Age- and gender-specific in-group bias and reluctance		
Age ego	−0.034	(0.030)
Girl alter	−0.309***	(0.085)
Girl ego	−0.438**	(0.151)
Girl ego x Girl alter	0.764***	(0.158)
Muslim alter	−0.096	(0.103)
Muslim ego	−0.118†	(0.065)
Muslim ego x Muslim alter	0.632***	(0.134)
Girl ego x Muslim ego	−0.192	(0.132)
Girl ego x Muslim alter	−0.263†	(0.155)
Girl ego x Muslim ego x Muslim alter	0.123	(0.187)
Girl alter x Muslim ego	−0.108	(0.211)
Girl alter x Muslim alter	−0.127	(0.206)
Girl alter x Muslim ego x Muslim alter	0.068	(0.532)
Girl ego x Girl alter x Muslim ego	0.348	(0.243)
Girl ego x Girl alter x Muslim alter	0.270	(0.304)

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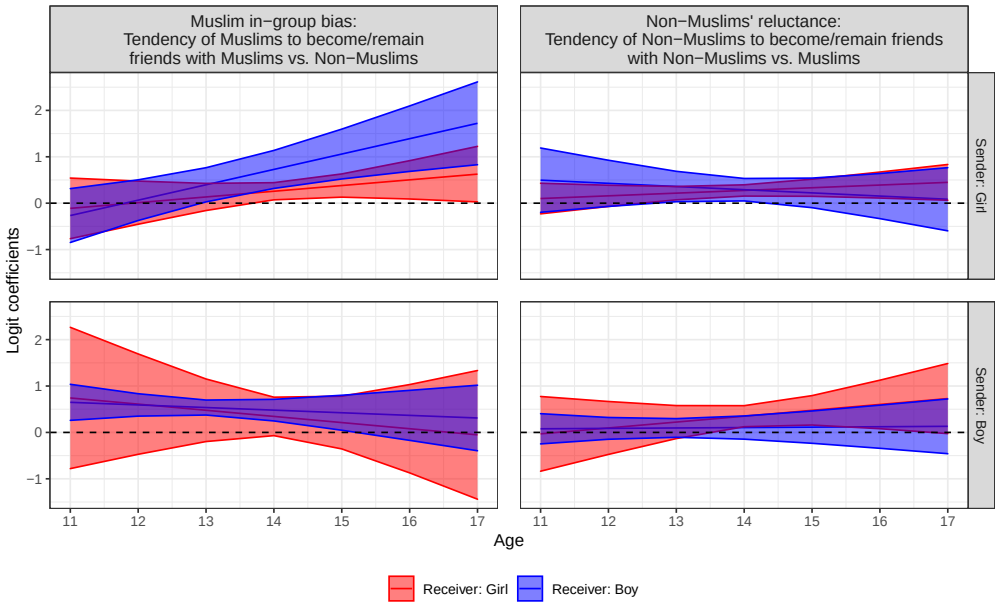
Table B.5 *continued from previous page*

	Estimate	SE
Girl ego x Girl alter x Muslim ego x Muslim alter	−0.473	(0.576)
Age ego x Girl ego	0.094	(0.068)
Age ego x Girl alter	0.037	(0.037)
Age ego x Girl ego x Girl alter	−0.103	(0.066)
Age ego x Muslim ego	0.024	(0.074)
Age ego x Muslim alter	−0.009	(0.069)
Age ego x Muslim ego x Muslim alter	−0.047	(0.126)
Age ego x Girl ego x Muslim ego	−0.334*	(0.148)
Age ego x Girl ego x Muslim alter	0.078	(0.133)
Age ego x Girl ego x Muslim ego x Muslim alter	0.310	(0.187)
Age ego x Girl alter x Muslim ego	0.063	(0.129)
Age ego x Girl alter x Muslim alter	−0.118	(0.115)
Age ego x Girl alter x Muslim ego x Muslim alter	0.042	(0.345)
Age ego x Girl ego x Girl alter x Muslim ego	0.121	(0.182)
Age ego x Girl ego x Girl alter x Muslim alter	−0.009	(0.189)
Age ego x Girl ego x Girl alter x Muslim ego x Muslim alter	−0.123	(0.417)

Note: $^{\dagger}p < .10$,$^{*}p < .05$,$^{**}p < .01$,$^{***}p < .001$. Results from REML meta-analysis based on 8 grade-level networks. Coefficients and standard errors (SE). Student age is recoded so age 13 is the reference category, i.e., takes a value of zero in the analysis. Thus, age is +1 for 14-year-old students and −1 for twelve-year-old students.

Figure B.1: Muslim In-Group Bias and Non-Muslim Reluctance in Friendships with Boys and Girls by Age. Predictions from Dynamic SAOM Analysis. (Full Model Results in Table B.5)



B.3 Full Model Results from GCM Analysis

Table B.6: Full Model Results for Fixed-Effects GCM Analysis of Gendered Excess Segregation

	Estimate	SE
Age 12 *(Ref.: Age 11)*	-0.034	(0.040)
Age 13	-0.043	(0.040)
Age 14	-0.006	(0.040)
Age 15	0.001	(0.041)
Age 16	-0.027	(0.042)
Age 17	-0.033	(0.049)
Girl x Age 12	0.105^{*}	(0.053)
Girl x Age 13	0.130^{*}	(0.053)
Girl x Age 14	0.146^{**}	(0.053)
Girl x Age 15	0.144^{**}	(0.054)
Girl x Age 16	0.215^{***}	(0.056)
Girl x Age 17	0.300^{***}	(0.067)
Non-Muslim x Age 12	0.025	(0.047)
Non-Muslim x Age 13	0.043	(0.047)
Non-Muslim x Age 14	0.017	(0.047)
Non-Muslim x Age 15	0.004	(0.048)
Non-Muslim x Age 16	0.040	(0.050)
Non-Muslim x Age 17	0.035	(0.058)
Girl x Non-Muslim x Age 12	-0.092	(0.065)
Girl x Non-Muslim x Age 13	$-0.115^{\dagger}$	(0.065)
Girl x Non-Muslim x Age 14	-0.129^{*}	(0.065)
Girl x Non-Muslim x Age 15	$-0.110^{\dagger}$	(0.066)
Girl x Non-Muslim x Age 16	-0.165^{*}	(0.069)
Girl x Non-Muslim x Age 17	-0.250^{**}	(0.081)

Note: $^{\dagger}p < .10, ^{*}p < .05, ^{**}p < .01, ^{***}p < .001$. Coefficients and standard errors (SE). Main effects of *Girl/Boy* and *Muslim/Non-Muslim* are absorbed by student-level fixed-effects.

Table B.7: Full Model Results for Fixed-Effects GCM Analysis of Gendered Excess Segregation in Friendships with Boys and Girls

	Friendships with Boys		Friendships with Girls	
	Estimate	SE	Estimate	SE
Age 12 *(Ref.: Age 11)*	−0.062	(0.045)	−0.011	(0.210)
Age 13	−0.074†	(0.045)	0.047	(0.212)
Age 14	−0.038	(0.045)	0.079	(0.212)
Age 15	−0.036	(0.046)	0.080	(0.210)
Age 16	−0.066	(0.048)	0.083	(0.213)
Age 17	−0.082	(0.055)	0.113	(0.225)
Girl x Age 12	0.342**	(0.109)	0.087	(0.215)
Girl x Age 13	0.387***	(0.111)	0.056	(0.216)
Girl x Age 14	0.375***	(0.111)	0.070	(0.216)
Girl x Age 15	0.313**	(0.113)	0.082	(0.215)
Girl x Age 16	0.413***	(0.116)	0.114	(0.218)
Girl x Age 17	0.428**	(0.148)	0.169	(0.232)
Non-Muslim x Age 12	0.068	(0.054)	−0.070	(0.223)
Non-Muslim x Age 13	0.093†	(0.054)	−0.126	(0.224)
Non-Muslim x Age 14	0.068	(0.054)	−0.101	(0.224)
Non-Muslim x Age 15	0.061	(0.055)	−0.107	(0.222)
Non-Muslim x Age 16	0.104†	(0.057)	−0.101	(0.226)
Non-Muslim x Age 17	0.110†	(0.066)	−0.200	(0.241)
Girl x Non-Muslim x Age 12	−0.341**	(0.129)	−0.001	(0.230)
Girl x Non-Muslim x Age 13	−0.438***	(0.131)	0.049	(0.231)
Girl x Non-Muslim x Age 14	−0.417**	(0.130)	−0.009	(0.231)
Girl x Non-Muslim x Age 15	−0.342**	(0.132)	−0.000	(0.230)
Girl x Non-Muslim x Age 16	−0.407**	(0.136)	−0.025	(0.234)
Girl x Non-Muslim x Age 17	−0.447**	(0.169)	−0.032	(0.251)

Note: $^{\dagger}p < .10$,* $p < .05$,** $p < .01$,*** $p < .001$. Coefficients and standard errors (SE). Main effects of *Girl/Boy* and *Muslim/ Non-Muslim* are absorbed by student-level fixed-effects.

B.4 Comparison of Muslim Boys and Girls in Upper Secondary vs. Other Schools

Table B.8: Mean Attitudes and Behavior of Muslim Boys and Girls in Upper Secondary Schools vs. Other Schools

Egalitarian gender role attitudes (Range: 0-4)

	No upper secondary	Upper secondary	Difference
Boy	1.55	1.90	0.35*
Girl	1.97	2.58	0.60***

Liberal attitudes towards unmarried cohabitation (Range: 0-3)

	No upper secondary	Upper secondary	Difference
Boy	1.30	1.35	0.05
Girl	0.85	1.06	0.21†

Liberal attitudes towards homosexuality (Range: 0-3)

	No upper secondary	Upper secondary	Difference
Boy	0.32	0.49	0.17
Girl	0.68	1.46	0.77***

Liberal attitudes towards divorce (Range: 0-3)

	No upper secondary	Upper secondary	Difference
Boy	0.44	0.79	0.34***
Girl	0.71	1.27	0.57***

Liberal attitudes towards abortion (Range: 0-3)

	No upper secondary	Upper secondary	Difference
Boy	0.20	0.30	0.10
Girl	0.20	0.43	0.23***

Frequency of prayer (Range: 0-5)

	No upper secondary	Upper secondary	Difference
Boy	2.48	2.25	−0.23
Girl	2.23	2.33	0.10

Frequency of mosque attendance (Range: 0-4))

	No upper secondary	Upper secondary	Difference
Boy	2.01	1.93	−0.08
Girl	1.42	1.21	−0.20

Importance of religion (Range: 0-3)

	No upper secondary	Upper secondary	Difference
Boy	2.56	2.49	−0.08
Girl	2.63	2.47	−0.16*

Note: $^{\dagger}p < .10$,$^{*}p < .05$,$^{**}p < .01$,$^{***}p < .001$.

Appendix C

Appendix to Chapter 4

C.1 Check for Linear Age Trend

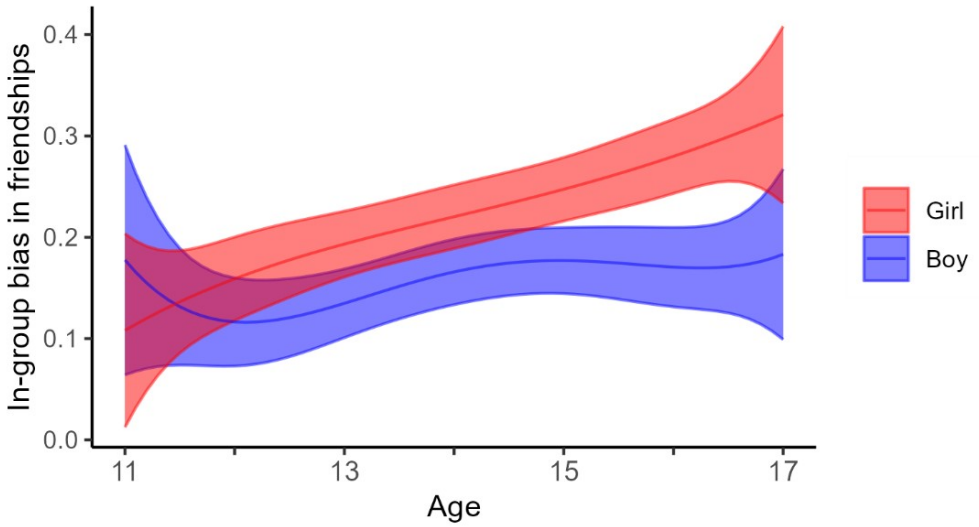
In order to test whether the relationship between age and in-group bias is linear, I fit a GCM akin to the baseline Model M0 that includes a linear, squared, cubic and quartic age trend (Table C.1). All age predictors are orthogonalized to avoid collinearity. For both boys and girls, only the linear age trend is significantly related to in-group bias. Figure C.1 shows predicted values of in-group bias from this model and also supports a linear age trend. The only substantial nonlinearity is observed between age 11 and age 12 for Muslim boys, but these estimates are imprecise due to the low number of observations.

Table C.1: Nonlinear Age Effects on the In-Group Bias of Muslim Girls and Boys from Random-effects GCM

	Boys		Girls	
Age linear	0.803^{*}	(0.383)	2.042^{***}	(0.347)
Age squared	-0.188	(0.328)	-0.028	(0.300)
Age cubic	-0.373	(0.314)	0.171	(0.292)
Age quartic	0.372	(0.305)	-0.023	(0.294)

Note: $^{\dagger}p < .10,^{*}\ p < .05,^{**}\ p < .01,^{***}\ p < .001$. $N = 737$ students and $N = 2239$ person-waves. Standard errors in parentheses. School grade fixed effects (grade dummies included but not shown). Age transformed to range from 0 (age 11) to 1 (age 17). Satterthwaite-method used for computing the degrees of freedom and t-statistics.

Figure C.1: Predicted In-Group Bias by Age for Muslim Girls and Boys from Random-Effects GCM with Non-Linear Age Trends



Note: 95% confidence intervals. Controlled for school-grade fixed-effects.

C.2 Full Model Results from GCM Analysis

Table C.2: Full Model Results for Combined Random-Effects Growth Curve Model Analysis of Gender-Specific Trajectories and Gender-Specific Effects of Religiosity, Parental Control, and Spending time in Club

	M0: Baseline: Gross gender gap		M1: Gender-specific trajectories		M2: Gender-specific effects	
Age	0.074^{*}	(0.034)	0.078^{*}	(0.034)	0.083^{*}	(0.034)
Girl (Ref.: Boy)	0.009	(0.029)	0.018	(0.029)	-0.067	(0.050)
Girl x Age	0.109^{*}	(0.045)	0.094^{*}	(0.045)	0.072	(0.045)
Religiosity			0.015^{***}	(0.004)	0.009	(0.006)
Girl x Religiosity					0.011	(0.007)
Parental control			0.010	(0.006)	-0.007	(0.009)
Girl x Parental control					0.034^{**}	(0.012)
Spending time in a club			0.000	(0.003)	0.007	(0.004)
Girl x Spending time in a club					-0.014^{*}	(0.006)
Constant	0.127^{**}	(0.048)	0.052	(0.052)	$0.097^{\dagger}$	(0.057)

Note: $^{\dagger}p < .10$,* $p < .05$,** $p < .01$,*** $p < .001$. $N = 737$ students and $N = 2239$ person-waves in each model. Standard errors in parentheses. School grade fixed effects (grade dummies included - not shown). Age transformed to range from 0 (age 11) to 1 (age 17). Satterthwaite-method used for computing the degrees of freedom and t-statistics.

Table C.3: Full Model Results for Separate Random-Effects Growth Curve Model Analysis of Gender-Specific Trajectories and Gender-Specific Effects of Religiosity, Parental Control, and Leisure Time Activities

Religiosity

	M0: Baseline: Gross gender gap		M1: Gender-specific trajectories		M2: Gender-specific effects	
Age	0.074*	(0.034)	0.070*	(0.034)	0.078*	(0.034)
Girl (Ref.: Boy)	0.009	(0.029)	0.010	(0.029)	−0.079†	(0.043)
Girl x Age	0.109*	(0.045)	0.107*	(0.045)	0.089*	(0.045)
Religiosity			0.010†	(0.006)	−0.006	(0.009)
Girl x Religiosity					0.034**	(0.012)
Constant	0.127**	(0.048)	0.099*	(0.050)	0.147**	(0.053)

Parental Control

	M0		M1		M2	
Age	0.074*	(0.034)	0.070*	(0.034)	0.078*	(0.034)
Girl (Ref.: Boy)	0.009	(0.029)	0.010	(0.029)	−0.079†	(0.043)
Girl x Age	0.109*	(0.045)	0.107*	(0.045)	0.089*	(0.045)
Religiosity			0.010†	(0.006)	−0.006	(0.009)
Girl x Religiosity					0.034**	(0.012)
Constant	0.127**	(0.048)	0.099*	(0.050)	0.147**	(0.053)

Spending time in club

	M0		M1		M2	
Age	0.074*	(0.034)	0.074*	(0.034)	0.074*	(0.034)
Girl (Ref.: Boy)	0.009	(0.029)	0.009	(0.029)	0.042	(0.033)
Girl x Age	0.109*	(0.045)	0.109*	(0.045)	0.104*	(0.045)
Spending time in club			0.000	(0.003)	0.007	(0.004)
Girl x Spending time in club					−0.014*	(0.006)
Constant	0.127**	(0.048)	0.128**	(0.049)	0.106*	(0.049)

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Table C.3 *continued from previous page*

Going to youth center

	M0		M1		M2	
Age	0.074*	(0.034)	0.076*	(0.034)	0.076*	(0.034)
Girl (Ref.: Boy)	0.009	(0.029)	0.010	(0.029)	0.012	(0.031)
Girl x Age	0.109*	(0.045)	0.116*	(0.045)	0.115*	(0.045)
Going to youth centre			0.009*	(0.004)	0.010†	(0.006)
Girl x Going to youth centre					−0.001	(0.009)
Constant	0.127**	(0.048)	0.109*	(0.048)	0.109*	(0.049)

Partying

	M0		M1		M2	
Age	0.074*	(0.034)	0.074*	(0.034)	0.073*	(0.034)
Girl (Ref.: Boy)	0.009	(0.029)	0.010	(0.029)	0.022	(0.030)
Girl x Age	0.109*	(0.045)	0.110*	(0.045)	0.109*	(0.045)
Partying			0.002	(0.004)	0.007	(0.006)
Girl x Partying					−0.013	(0.009)
Constant	0.127**	(0.048)	0.125**	(0.048)	0.119*	(0.048)

Note: $^{\dagger}p < .10$,$^{*}p < .05$,$^{**}p < .01$,$^{***}p < .001$. $N = 737$ students and $N = 2239$ person-waves in each model. Standard errors in parentheses. School grade fixed effects (grade dummies included - not shown). Age transformed to range from 0 (age 11) to 1 (age 17). Satterthwaite-method used for computing the degrees of freedom and t-statistics.

C.3 Robustness Checks

Table C.4: Overview of Gender Differences in In-Group Friendship-Making: Different Operationalizations

Variable	Mean (SD)/Proportion		Gender difference
	Girls	Boys	
In-group friendships			
(Almost) only Turkish-origin friends	0.38	0.27	**
Turkish-Origin friends (Linear)	0.72	0.65	**
(Almost) no out-group friends	0.15	0.09	*
Out-group friends (reversed, linear)	0.83	0.80	**

Note: $^{\dagger}p < .10$,$^{*}p < .05$,$^{**}p < .01$,$^{***}p < .001$. $N = 354$ girls and $N = 275$ boys.

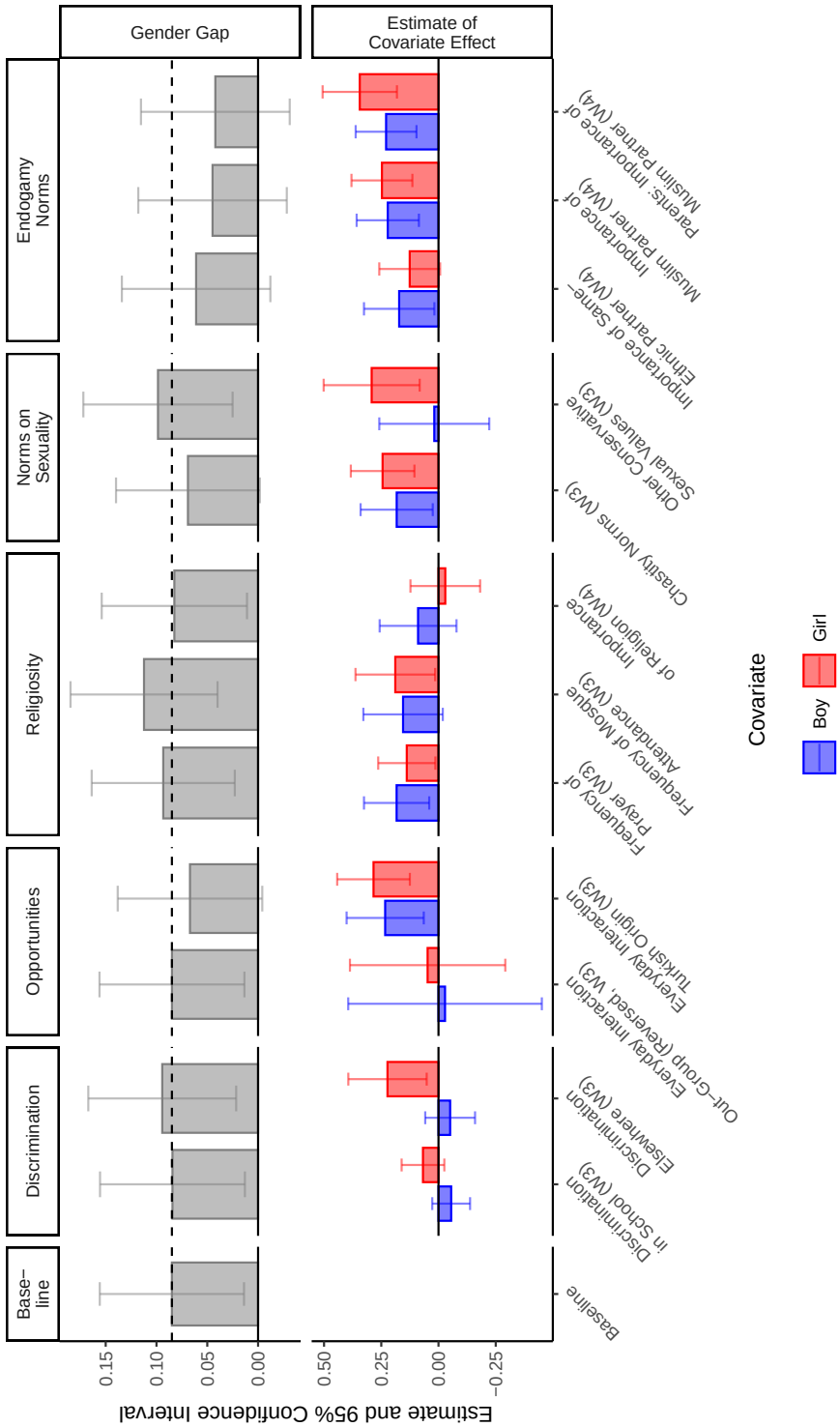
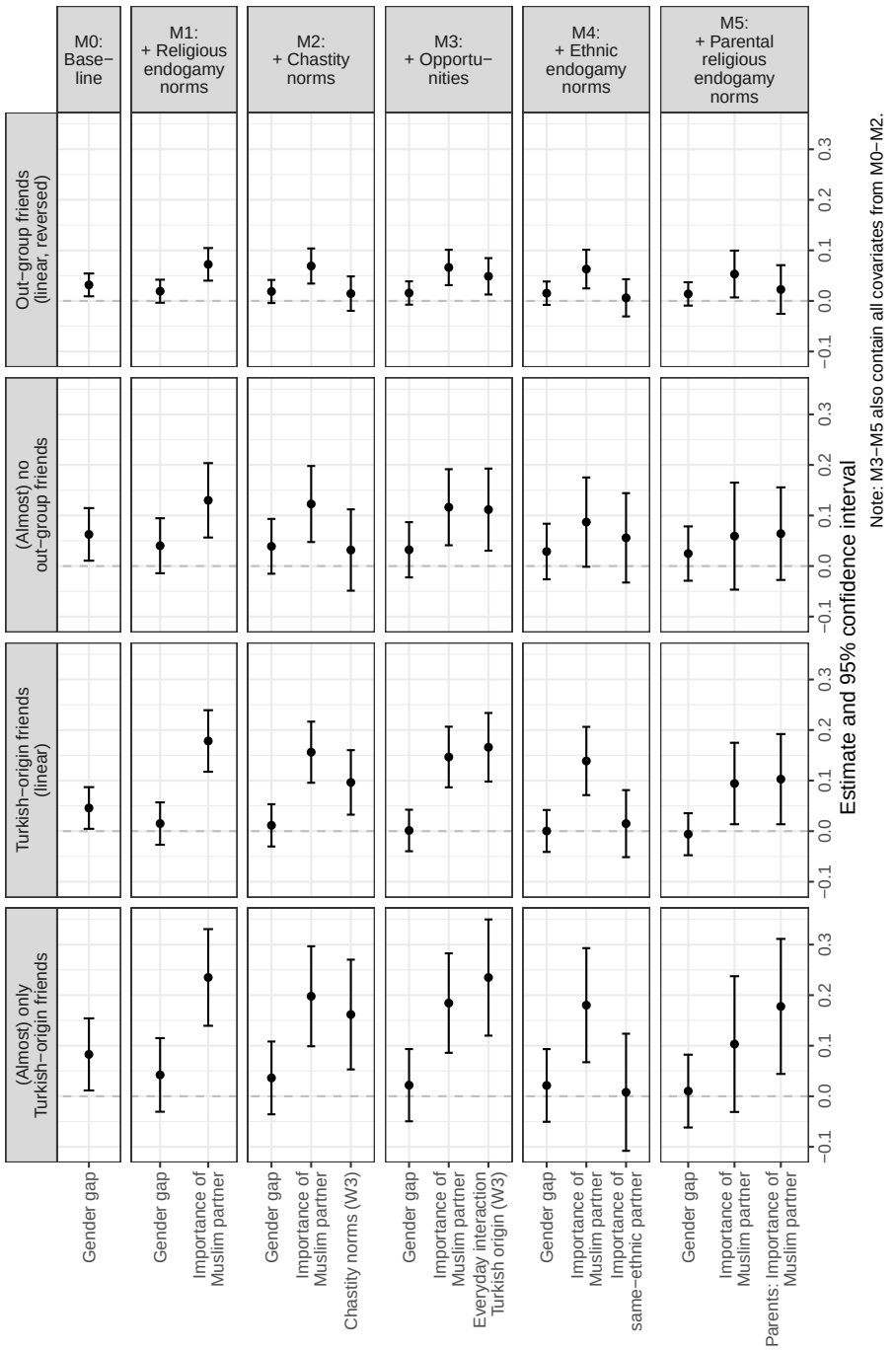


Figure C.2: Explaining the Gender Gap: Gender Differences in Characteristics, Gender-Specific Association with In-Group Friendship-Making, and Residual Gender Gap after Accounting for Characteristics

Figure C.3: Robustness Check: Alternative Operationalizations of In-Group Friendship-Making



C.4 Full Model Results

Table C.5: Full Model Results for Stepwise Linear Probability Model Analysis

	M0	M1	M2	M3	M4	M5
Gender Gap	0.083*	0.042	0.036	0.022	0.021	0.010
	(0.036)	(0.037)	(0.037)	(0.036)	(0.037)	(0.037)
Importance of		0.235***	0.198***	0.184***	0.180**	0.103
Muslim Partner		(0.049)	(0.050)	(0.050)	(0.058)	(0.068)
Chastity Norms			0.162**	0.162**	0.161**	0.160**
			(0.055)	(0.054)	(0.055)	(0.055)
Everyday Interaction				0.235***	0.235***	0.226***
Turkish Origin				(0.059)	(0.059)	(0.059)
Importance of					0.008	−0.007
Same-Ethnic Partner					(0.059)	(0.060)
Parents: Importance of						0.178**
Muslim Partner						(0.068)
Change in Gender Gap		* * *		*		†
Change in Importance of Muslim Partner			* * *	†		* * *
Ethnic Origin: Turkey	0.271***	0.269***	0.256***	0.244***	0.244***	0.242***
(Ref.: Other)	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)
Highest Parental ISEI	−0.161*	−0.129	−0.115	−0.106	−0.106	−0.104
	(0.080)	(0.079)	(0.078)	(0.077)	(0.077)	(0.077)
School Type (Ref. Upper Secodary)						
Intermediate	0.022	0.035	0.039	0.034	0.034	0.039
Secondary	(0.054)	(0.053)	(0.053)	(0.052)	(0.052)	(0.052)
Lower	0.057	0.068	0.069	0.070	0.070	0.072
Secondary	(0.052)	(0.051)	(0.051)	(0.051)	(0.051)	(0.051)
Other	−0.098	−0.069	−0.063	−0.059	−0.059	−0.052
	(0.095)	(0.089)	(0.086)	(0.083)	(0.083)	(0.082)
Lower Secondary	0.041	0.059	0.068	0.055	0.055	0.068
	(0.061)	(0.059)	(0.059)	(0.057)	(0.057)	(0.058)
Intercept	0.120*	−0.036	−0.108	−0.207**	−0.208**	−0.279***
	(0.057)	(0.063)	(0.066)	(0.069)	(0.069)	(0.071)

Note: $^{\dagger}p < .10$,* $p < .05$,** $p < .01$,*** $p < .001$. Change in estimate of the gender gap and of importance of Muslim partner assessed with formal mediation analysis (Tingley et al. 2014).

Table C.6: Full Model Results for Stepwise Linear Probability Model Analysis: Extended Models with all Covariates

	M0	M1	M2	M3	M4	M5
Gender Gap	0.119**	0.073†	0.057	0.042	0.041	0.029
	(0.040)	(0.043)	(0.042)	(0.042)	(0.042)	(0.042)
Importance of		0.192***	0.174**	0.159**	0.147*	0.068
Muslim Partner		(0.056)	(0.056)	(0.056)	(0.064)	(0.073)
Chastity Norms			0.144*	0.144*	0.142*	0.142*
			(0.059)	(0.057)	(0.058)	(0.058)
Everyday Interaction				0.235***	0.235***	0.226***
Turkish Origin				(0.059)	(0.059)	(0.059)
Importance of					0.023	0.007
Same-Ethnic Partner					(0.061)	(0.061)
Parents: Importance of						0.183**
Muslim Partner						(0.068)
Change in Gender Gap		* * *	**	*		*
Change in Importance of Muslim Partner			*			**
Discrimination	−0.009	−0.008	−0.016	−0.020	−0.020	−0.022
in School (W3)	(0.042)	(0.042)	(0.042)	(0.042)	(0.043)	(0.043)
Discrimination	0.057	0.047	0.054	0.052	0.053	0.065
Elsewhere (W3)	(0.062)	(0.062)	(0.061)	(0.062)	(0.062)	(0.064)
Everyday Interaction	−0.040	−0.038	−0.036	−0.050	−0.052	−0.070
Out-Group (W3)	(0.134)	(0.134)	(0.133)	(0.132)	(0.132)	(0.131)
Frequency of	0.063	0.019	0.006	0.006	0.007	−0.000
Mosque Attendance (W3)	(0.082)	(0.082)	(0.081)	(0.081)	(0.081)	(0.081)
Frequency of	0.115†	0.079	0.066	0.067	0.070	0.069
Prayer (W3)	(0.062)	(0.063)	(0.063)	(0.062)	(0.063)	(0.063)
Importance of	0.030	−0.001	−0.006	0.008	0.005	0.010
Religion (W4)	(0.057)	(0.057)	(0.058)	(0.057)	(0.058)	(0.058)
Other Conservative	0.134	0.094	0.034	0.032	0.031	0.031
Sexual Values (W3)	(0.084)	(0.084)	(0.087)	(0.085)	(0.086)	(0.085)

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Table C.6 *continued from previous page*

	M0	M1	M2	M3	M4	M5
Ethnic Origin: Turkey	0.270***	0.271***	0.259***	0.246***	0.246***	0.245***
(Ref.: Other)	(0.036)	(0.036)	(0.036)	(0.036)	(0.036)	(0.036)
Highest Parental ISEI	−0.165*	−0.137†	−0.123	−0.115	−0.115	−0.114
	(0.080)	(0.079)	(0.079)	(0.078)	(0.078)	(0.078)
School Type						
(Ref. Upper Secodary)						
Intermediate	0.020	0.030	0.034	0.028	0.028	0.032
Secondary	(0.054)	(0.054)	(0.053)	(0.053)	(0.053)	(0.052)
Lower	0.059	0.065	0.067	0.069	0.068	0.070
Secondary	(0.053)	(0.052)	(0.052)	(0.052)	(0.052)	(0.051)
Other	−0.126	−0.093	−0.079	−0.074	−0.075	−0.068
	(0.092)	(0.089)	(0.086)	(0.083)	(0.084)	(0.083)
Lower Secondary	0.058	0.067	0.068	0.053	0.053	0.064
	(0.062)	(0.061)	(0.061)	(0.059)	(0.059)	(0.060)
Intercept	−0.101	−0.137	−0.145	−0.245**	−0.245**	−0.315***
	(0.094)	(0.093)	(0.092)	(0.093)	(0.093)	(0.095)

Note: $^{\dagger}p < .10$,$^{*}p < .05$,$^{**}p < .01$,$^{***}p < .001$; two-tailed tests. Change in estimate of the gender gap and of importance of Muslim partner assessed with formal mediation analysis (Tingley et al. 2014).

Appendix D

Appendix to Chapter 5

D.1 Full Model Results from Multilevel ERGM Models

Table D.1: Full Model Results for Multilevel ERGM Analysis: Gender Homophily by Religion

	Overall Sample		Muslim/ Non-Muslim		Religious Groups	
	AME	SE	AME	SE	AME	SE
Structural Network Effects						
Edges	-0.309^{***}	(0.002)	-0.325^{***}	(0.003)	-0.327^{***}	(0.003)
Mutual	0.207^{***}	(0.003)	0.207^{***}	(0.003)	0.206^{***}	(0.003)
GWESP (Decay: 0.3)	0.053^{***}	(0.001)	0.053^{***}	(0.001)	0.053^{***}	(0.001)
Covariate Control Effects						
Same ethnic background	0.010^{***}	(0.001)	0.010^{***}	(0.001)	0.009^{***}	(0.001)
Same religion	0.011^{***}	(0.001)	0.011^{***}	(0.001)	0.015^{***}	(0.001)
Difference in ISEI	-0.000^{***}	(0.000)	-0.000^{***}	(0.000)	-0.000^{***}	(0.000)
Gender and Religion Main Effects						
Girl outdegree *(Ref.: Boy)*	-0.003^{**}	(0.001)	-0.003^{**}	(0.001)	-0.003^{*}	(0.001)
Non-Muslim outdegree *(Ref.: Muslim)*	-0.009^{***}	(0.001)	0.013^{***}	(0.004)		
Christian outdegree *(Ref.: Muslim)*					0.011^{**}	(0.004)
Other religion outdegree *(Ref.: Muslim)*					0.020^{*}	(0.008)
No religion outdegree *(Ref.: Muslim)*					0.018^{**}	(0.006)
Gender Homopily Effects						
Same gender	0.084^{***}	(0.002)	0.103^{***}	(0.003)	0.103^{***}	(0.003)
Non-Muslim outdegree x Same Gender			-0.026^{***}	(0.004)		
Christian outdegree x Same gender					-0.028^{***}	(0.004)
Other religion outdegree x Same gender					$-0.016^{\dagger}$	(0.009)
No religion outdegree x Same gender					-0.025^{***}	(0.007)

Note: $^{\dagger}p < .10$,$^{*}p < .05$,$^{**}p < .01$,$^{***}p < .001$; two-tailed tests. Mean average marginal effects (AMEs) on the probability of friendship and their standard errors from 30 imputed data sets.

Table D.2: Full Model Results for Multilevel ERGM Analysis: Gender Homophily by Religion and Gender

	AME	SE
Structural Network Effects		
Edges	-0.332^{***}	(0.005)
Mutual	0.207^{***}	(0.003)
GWESP (Decay: 0.3)	0.053^{***}	(0.001)
Covariate Control Effects		
Same ethnic background	0.010^{***}	(0.001)
Same religion	0.011^{***}	(0.001)
Difference in ISEI	-0.000^{***}	(0.000)
Gender and Religion Main Effects		
Girl outdegree *(Ref.: Boy)*	0.011	(0.008)
Non-Muslim outdegree *(Ref.: Muslim)*	0.015^{*}	(0.006)
Girl outdegree x Non-Muslim outdegree	-0.004	(0.009)
Gender Homophily Effects		
Same gender	0.112^{***}	(0.006)
Girl outdegree x Same gender	-0.017^{*}	(0.008)
Non-Muslim outdegree x Same gender	-0.030^{***}	(0.006)
Non-Muslim outdegree x Girl outdegree x Same gender	0.006	(0.009)

Note: $^{\dagger}p < .10$,$^{*}p < .05$,$^{**}p < .01$,$^{***}p < .001$; two-tailed tests. Mean average marginal effects (AMEs) on the probability of friendship and their standard errors from 30 imputed data sets.

Table D.3: Full Model Results for Multilevel ERGM Analysis: Gender Homophily by Attitudes towards Cohabitation (Attitudes t. cohab.)

	Adolescent Attitudes		Parental Attitudes	
	AME	SE	AME	SE
Structural Network Effects				
Edges	-0.340^{***}	(0.006)	-0.301^{***}	(0.009)
Mutual	0.206^{***}	(0.003)	0.206^{***}	(0.003)
GWESP (Decay: 0.3)	0.053^{***}	(0.001)	0.053^{***}	(0.001)
Covariate Control Effects				
Same ethnic background	0.011^{***}	(0.001)	0.011^{***}	(0.001)
Same religion	0.011^{***}	(0.001)	0.011^{***}	(0.001)
Difference in ISEI	-0.000^{***}	(0.000)	-0.000^{***}	(0.000)
Gender, Religion, and Cohabitation Main Effects				
Girl outdegree *(Ref.: Boy)*	-0.003^{*}	(0.001)	-0.003^{*}	(0.001)
Non-Muslim outdegree *(Ref.: Muslim)*	0.035^{***}	(0.008)	-0.010	(0.011)
Attitudes t. cohab. outdegree	0.012^{***}	(0.003)	0.013^{***}	(0.004)
Non-Muslim outdegree x Attitudes t. cohab. outdegree	-0.016^{***}	(0.004)	-0.015^{***}	(0.004)
Parental attitudes t. cohab. outdegree			-0.003	(0.005)
Non-Muslim outdegree x Parental attitudes t. cohab. outdegree			0.001	(0.006)
Gender Homophily Effects				
Same gender	0.118^{***}	(0.006)	0.077^{***}	(0.010)
Attitudes t. cohab. outdegree x Same gender	-0.013^{***}	(0.004)	-0.014^{***}	(0.004)
Non-Muslim outdegree x Same gender	-0.038^{***}	(0.009)	-0.002	(0.012)
Non-Muslim outdegree x Attitudes t. cohab. outdegree x Same gender	0.012^{*}	(0.005)	0.012^{*}	(0.005)
Parental attitudes t. cohab. outdegree x Same gender			0.002	(0.006)
Non-Muslim outdegree x Parental attitudes t. cohab. outdegree x Same gender			-0.002	(0.006)

Note: $^{\dagger}p < .10$,$^{*}p < .05$,$^{**}p < .01$,$^{***}p < .001$; two-tailed tests. Mean average marginal effects (AMEs) on the probability of friendship and their standard errors from 30 imputed data sets.

Table D.4: Full Model Results for Multilevel ERGM Analysis: Gender Homophily by Religiosity and Attitudes towards Cohabitation

	Importance of Religion		Frequency of Prayer		Frequency of Mosque Attendance	
	M0	M1	M0	M1	M0	M1
Structural Network Effects						
Edges	−0.315***	−0.308***	−0.317***	−0.302***	−0.316***	−0.301***
Mutual	0.207***	0.206***	0.207***	0.206***	0.207***	0.206***
GWESP (Decay: 0.3)	0.053***	0.053***	0.053***	0.053***	0.053***	0.053***
Covariate Control Effects						
Same ethnic background	0.010***	0.011***	0.010***	0.010***	0.010***	0.011***
Same religion	0.011***	0.011***	0.011***	0.012***	0.011***	0.011***
Difference in ISEI	−0.000***	−0.000***	−0.000***	−0.000***	−0.000***	−0.000***
Gender, Religion, and Cohabitation Main Effects						
Girl outdegree *(Ref.: Boy)*	−0.003**	−0.003**	−0.003**	−0.002*	−0.003*	−0.002†
Non-Muslim outdegree *(Ref.: Muslim)*	0.010	0.000	0.010†	−0.009	0.009	−0.010
Effect of Religiosity						
Religiosity outdegree	−0.004	0.002	−0.003†	−0.001	−0.006†	−0.003
Non-Muslim outdegree x Religiosity outdegree	−0.002	−0.009	−0.002	−0.005†	−0.001	−0.005
Same gender	0.082***	0.075***	0.095***	0.077***	0.089***	0.072***

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Table D.4 *continued from previous page*

	Importance of Religion		Frequency of Prayer		Frequency of Mosque Attendance	
	M0	M1	M0	M1	M0	M1
Religiosity outdegree x Same gender	0.008	0.002	0.003	0.001	0.008**	0.006†
Non-Muslim outdegree x Same gender	−0.015	−0.008	−0.022**	−0.004	−0.016*	0.000
Religiosity outdegree x Non-Muslim outdegree x Same gender	0.000	0.006	0.000	0.003	−0.003	−0.001
Effect of Attitudes towards cohabitation						
Attitudes towards cohabitation outdegree		0.012***		0.011**		0.011**
Non-Muslim outdegree x Attitudes towards cohabitation outdegree		−0.018***		−0.017***		−0.017***
Attitudes towards cohabitation outdegree x Same gender		−0.013**		−0.013**		−0.011**
Non-Muslim outdegree x Attitudes towards cohabitation outdegree x Same gender		0.014**		0.012**		0.011*

Note: $^{\dagger}p < .10$,$^{*}p < .05$,$^{**}p < .01$,$^{***}p < .001$; two-tailed tests. Mean average marginal effects (AMEs) on the probability of friendship and their standard errors from 30 imputed data sets. M0 refers to models that only include the respective indicator of religiosity. M1 refers to models that also control for attitudes towards cohabitation.

D.2 Robustness Checks

Figure D.1: Variation in Gender Homophily by Attitudes towards Cohabitation among Muslim, Christian, and Non-Religious Youth from Multilevel ERGMs

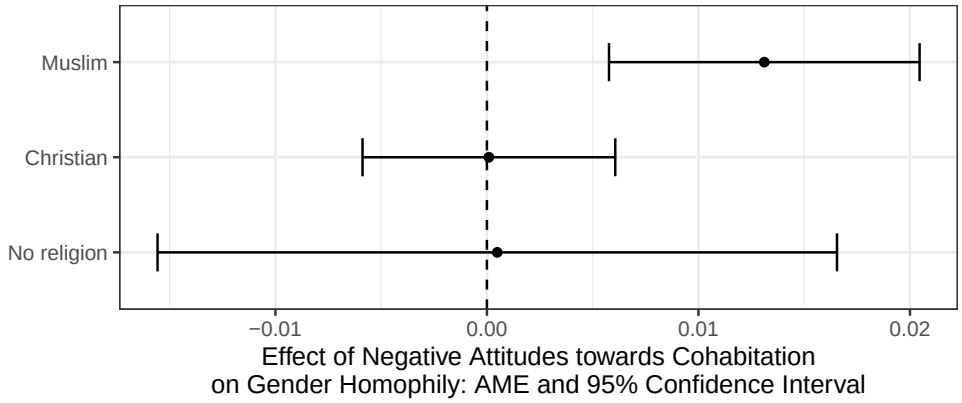


Figure D.2: Variation in Gender Homophily by Attitudes towards Cohabitation among Muslim and Non-Muslim Boys and Girls from Multilevel ERGMs

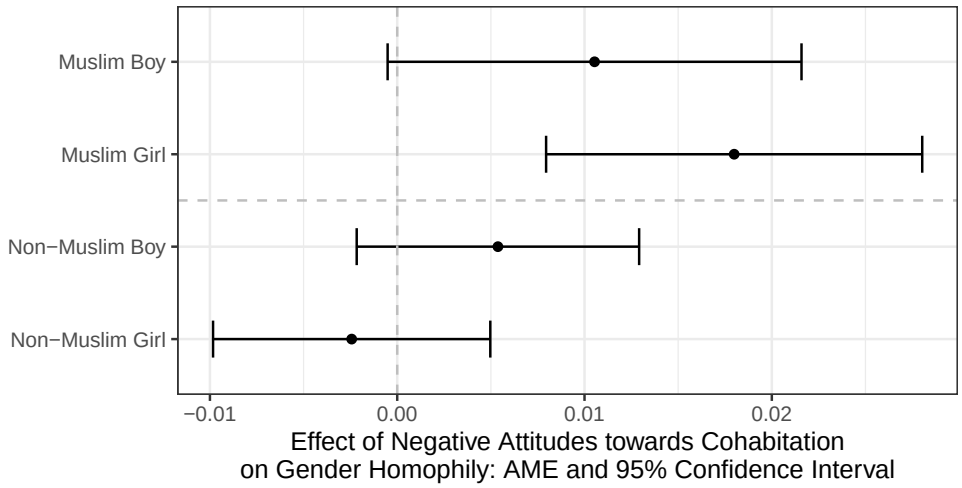


Figure D.3: Variation in Gender Homophily by Combination of Adolescents' and Parents' Attitudes towards Cohabitation among Muslim and Non-Muslim Youth from Multilevel ERGM

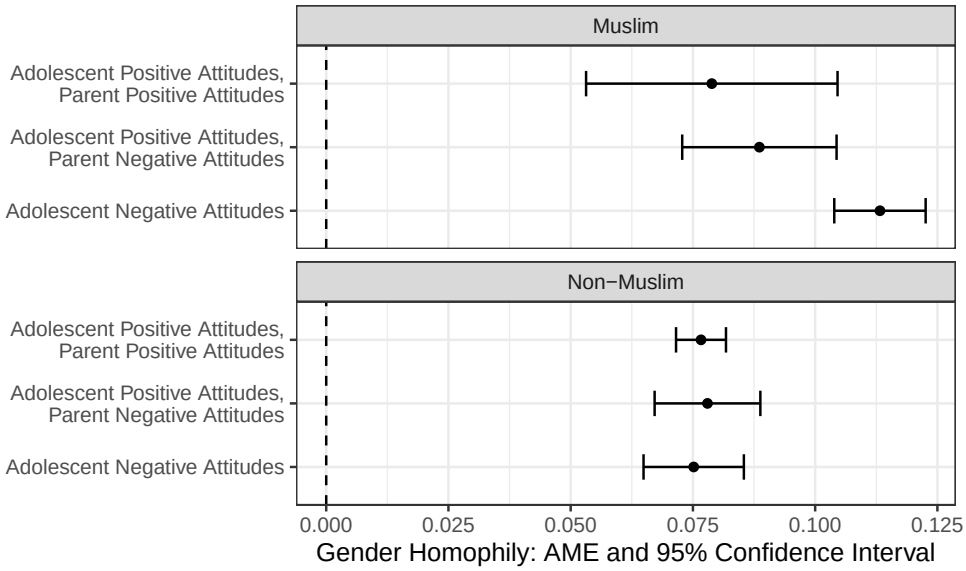
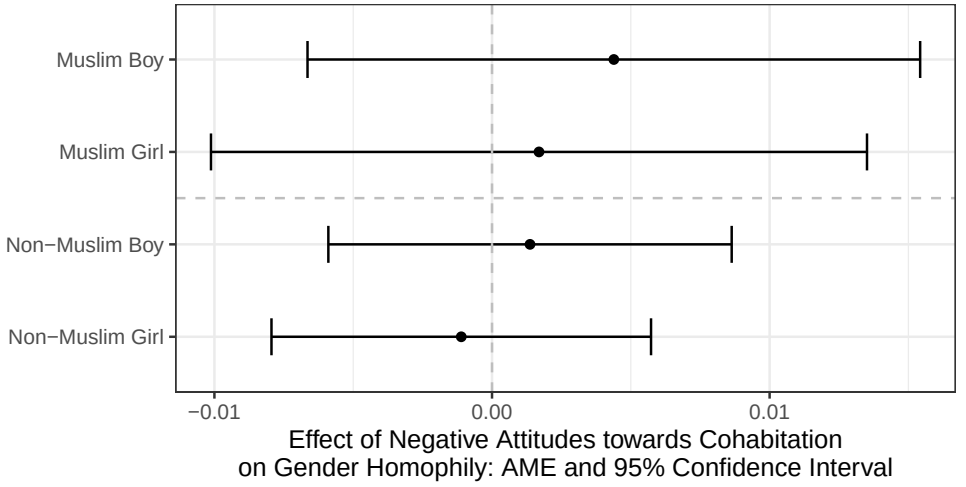


Figure D.4: Variation in Gender Homophily by Parental Attitudes towards Cohabitation among Muslim and Non-Muslim Boys and Girls from Multilevel ERGMs



Appendix E

Appendix to Chapter 6

E.1 Selectivity of the Network Sample

The analysis sample of the SAOM analysis in this chapter is identical to the analysis sample in Chapter 2. In Section A.1 of Appendix A, I have shown that, apart from school type, this sample does not substantially differ from the full CILS4EU sample in terms of relevant network characteristics and sociodemographics. In this section, I therefore restrict the attention to potential differences in the characteristics that are the analytical focus in this chapter—gender role attitudes and cross-gender friendships.

Figure E.1 shows the subgroup-specific mean number of egalitarian gender role attitudes in the full and in the analysis sample. For Muslim and non-Muslim youth and boys and girls, all differences are minor. Figure E.2 shows that differences in the proportion of cross-gender friends youth in the full and the analysis sample have also are small. Only among non-Muslim girls, the proportion of cross-gender friends is notably smaller in the analysis than in the

Figure E.1: Mean Egalitarian Gender Role Attitudes in Full and Analysis Sample

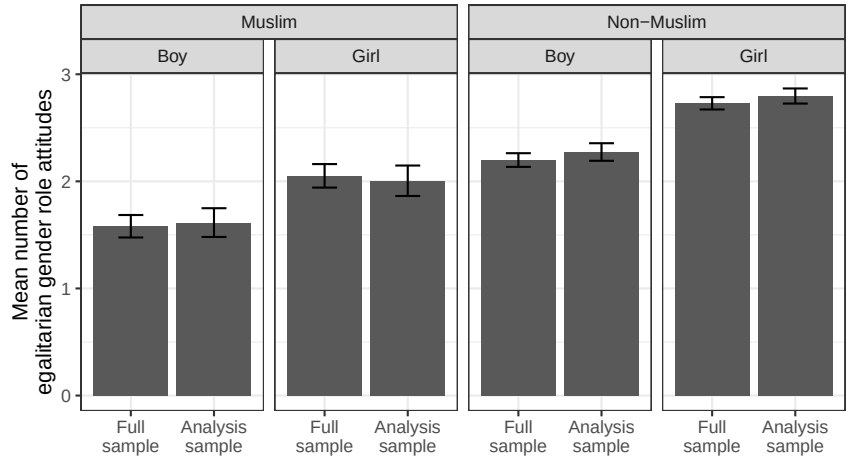


Figure E.2: Mean Proportion Cross-Gender Friends in Full and Analysis Sample

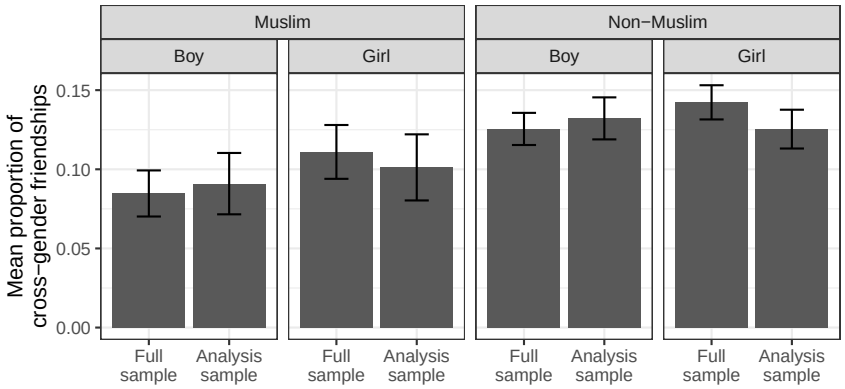
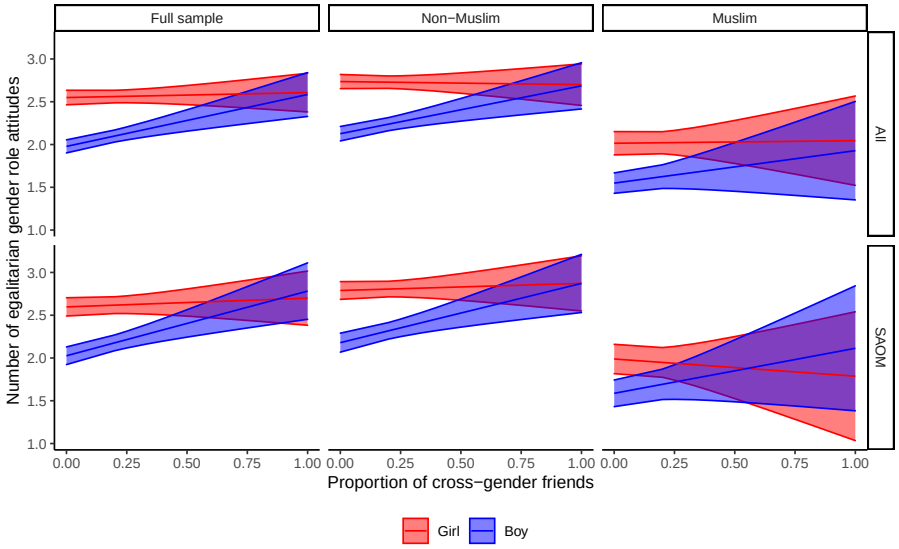


Figure E.3: Link between Cross-Gender Friendships and Gender Role Attitudes in Full and Analysis Sample

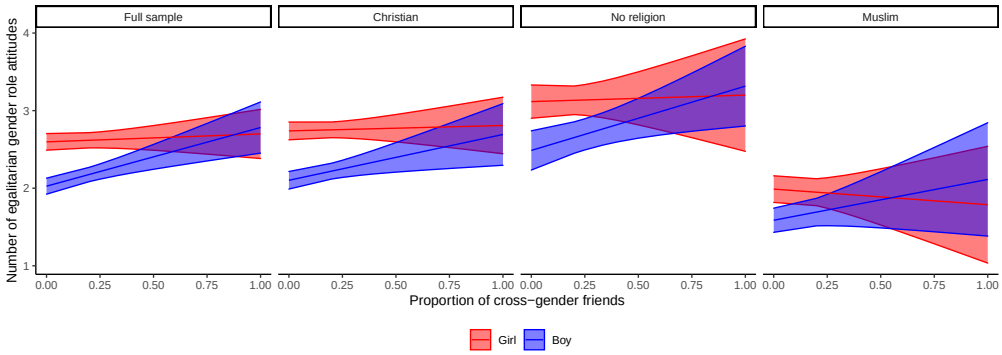


full sample. As the chapter's main focus in on Muslim youth, this difference among non-Muslims is less problematic. Finally, Figure E.3 compares the *link* between cross-gender friendships and gender role attitdes between the full and the analysis sample. Patterns are very similar for both samples. In both samples, a higher proportion of cross-gender friends is associated with more egalitarian gender role attitudes among boys (Muslim and non-Muslim), but not among girls. Based on this analysis, there is no reason to expect a selective sample either in terms of general characteristics (see Appendix A.1 for details) or the characteristics this chapter investigates.

E.2 Robustness Checks

In my main analysis, I only differentiate the link between cross-gender friendships and gender role attitudes between Muslim and non-Muslim youth. In Figure E.4, I further disaggregate non-Muslim into non-religious and Christian youth. This analysis demonstrates that non-religious youth, on average, hold more egalitarian gender role attitudes than Christian youth, but that the link between cross-gender friendships and gender role attitudes is very similar in both groups.

Figure E.4: Link between Cross-Gender Friendships and Gender Role Attitudes in Different Religious Groups



E.3 Derivation of Selection of Same-Gender Friends

I estimate the tendency to form and maintain friendships with same- vs. cross-gender peers with three effects: the *Girl ego*, *Girl alter*, and *Girl ego* $\times$ *Girl alter* effect, with corresponding coefficients $b_{Girl\ ego}$, $b_{Girl\ alter}$, and $b_{Girl\ ego \times Girl\ alter}$

For girls, the tendency to be friends with girls (*Girl ego* $=$ *Girl alter* $= 1$) is captured by the sum

$$b_{Girl\ ego} + b_{Girl\ alter} + b_{Girl\ ego \times Girl\ alter}.$$

Girls' tendency to be friends with boys (*Girl ego* $= 1$, *Girl alter* $= 0$) is captured by $b_{Girl\ ego}$. Accordingly, girls' tendency to have female rather than male friends is the difference of both expressions,

$$b_{Girl\ alter} + b_{Girl\ ego \times Girl\ alter}.$$

For boys (*Girl ego* $= 0$), the tendency to be friends with boys (*Girl alter* $= 0$) is 0. Boys' tendency to be friends with girls (*Girl alter* $= 1$) is $b_{Girl\ alter}$. Therefore, boys' tendency to have same- rather than cross-gender peers is $0 - b_{Girl\ alter} = -b_{Girl\ alter}$.

To capture variation in these gender-specific tendencies to be friends with same- rather than cross-gender peers by gender role attitudes, I interact all three effects with the *Gender role attitudes ego* effect, and to capture variation between Muslim and non-Muslim youth, I further interact all effects with the *Muslim ego* efect.

E.4 Full Model Results from SAOM Analysis

Table E.1: Full Results for M1 of SAOM Analysis: Influence of Cross-Gender Friends in the Aggregate Sample

	Posterior mean (SD)		
Evolution of Friendship Network			
Structural Network Effects			
Outdegree	0.699***	(0.178)	RE
Reciprocity	1.752***	(0.054)	RE
Transitive triplets	0.527***	(0.018)	RE
Transitive reciprocated triplets	−0.212***	(0.024)	RE
Indegree-popularity (square root)	0.084*	(0.040)	RE
Indegree-activity (square root)	−0.263***	(0.047)	RE
Outdegree-activity (square root)	−0.895***	(0.061)	RE
Covariate Control Effects			
Same Ethnic Background	0.064†	(0.033)	RE
Praying Frequency Alter	0.013	(0.012)	RE
Praying Frequency Ego	0.004	(0.013)	RE
Praying Frequency Similarity	0.058	(0.055)	RE
ISEI Alter	0.008	(0.010)	RE
ISEI Ego	−0.015	(0.011)	RE
ISEI Similarity	−0.030	(0.073)	RE
Muslim Alter	−0.196***	(0.044)	FE
Muslim Ego	−0.139**	(0.048)	FE
Muslim Ego x Muslim Alter	0.427***	(0.065)	FE
Selection Based on Gender Role Attitudes			
Girl Alter	−0.250***	(0.038)	FE
Girl Ego	−0.490***	(0.041)	FE
Girl Ego x Girl Alter	0.709***	(0.053)	FE
Gender Role Attitudes Ego	0.010	(0.017)	FE
Gender Role Attitudes Ego x Girl Ego	0.037	(0.038)	FE
Gender Role Attitudes Ego x Girl Alter	0.003	(0.032)	FE
Gender Role Attitudes Ego x Girl Ego x Girl Alter	−0.036	(0.049)	FE

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Table E.1 *continued from previous page*

	Posterior mean (SD)		
Evolution of Number of Egalitarian Gender Role Attitudes			
Control Effects			
Linear shape	0.294^{**}	(0.109)	RE
Quadratic shape	-0.024	(0.019)	RE
Praying Frequency	$-0.047^{\dagger}$	(0.024)	RE
ISEI	0.031	(0.020)	RE
Muslim *(Ref. Non-Muslim)*	-0.161^{**}	(0.072)	FE
Girl *(Ref. Boy)*	0.528^{***}	(0.074)	FE
Influence of Cross-Gender Friends			
Boy: Effect of Proportion Cross-Gender Friends	0.730^{***}	(0.224)	FE
Girl: Effect of Proportion Cross-Gender Friends	0.077	(0.243)	FE

Note: $^{\dagger}p < .10$,$^{*}p < .05$,$^{**}p < .01$,$^{***}p < .001$; two-tailed tests. Posterior means and standard deviations of posterior means are Bayesian analogs to point estimates and standard errors. All covariates are centered. RE indicates random effects and FE indicates fixed effects.

Table E.2: Full Results for M2 of SAOM Analysis: Influence of Cross-Gender Friends among Muslim and Non-Muslim Youth

	Posterior mean (SD)		
Evolution of Friendship Network			
Structural Network Effects			
Outdegree	0.758***	(0.175)	RE
Reciprocity	1.739***	(0.055)	RE
Transitive triplets	0.526***	(0.018)	RE
Transitive reciprocated triplets	−0.209***	(0.024)	RE
Indegree-popularity (square root)	0.078†	(0.041)	RE
Indegree-activity (square root)	−0.263***	(0.046)	RE
Outdegree-activity (square root)	−0.899***	(0.059)	RE
Covariate Control Effects			
Same Ethnic Background	0.064**	(0.032)	FE
Praying Frequency Alter	0.014	(0.012)	RE
Praying Frequency Ego	0.005	(0.014)	RE
Praying Frequency Similarity	0.060	(0.058)	RE
ISEI Alter	0.007	(0.010)	RE
ISEI Ego	−0.016	(0.011)	RE
ISEI Similarity	−0.034	(0.072)	RE
Selection Based on Gender Role Attitudes			
Girl Alter	−0.255***	(0.043)	FE
Girl Ego	−0.531***	(0.049)	FE
Girl Ego x Girl Alter	0.709***	(0.060)	FE
Gender Role Attitudes Ego	0.005	(0.020)	FE
Gender Role Attitudes Ego x Girl Ego	0.068	(0.049)	FE
Gender Role Attitudes Ego x Girl Alter	0.024	(0.038)	FE
Gender Role Attitudes Ego x Girl Ego x Girl Alter	−0.072	(0.063)	FE
Muslim Alter	−0.201***	(0.044)	FE
Muslim Ego	−0.211***	(0.063)	FE
Muslim Ego x Muslim Alter	0.430***	(0.066)	FE
Muslim Ego x Girl Alter	−0.028	(0.094)	FE
Muslim Ego x Girl Ego	0.094	(0.098)	FE
Muslim Ego x Girl Ego x Girl Alter	0.092	(0.124)	FE
Muslim Ego x Gender Role Attitudes Ego	0.015	(0.042)	FE

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Table E.2 *continued from previous page*

	Posterior mean (SD)		
Muslim Ego x Gender Role Attitudes Ego x Girl Alter	−0.115	(0.081)	FE
Muslim Ego x Gender Role Attitudes Ego x Girl Ego	−0.102	(0.087)	FE
Muslim Ego x Gender Role Attitudes Ego x Girl Ego x Girl Alter	0.195	(0.120)	FE
Evolution of Number of Egalitarian Gender Role Attitudes			
Control Effects			
Linear shape	0.282*	(0.111)	RE
Quadratic shape	−0.027	(0.018)	RE
Praying Frequency	−0.052*	(0.024)	RE
ISEI	0.031	(0.020)	RE
Muslim *(Ref. Non-Muslim)*	−0.182	(0.122)	FE
Girl *(Ref. Boy)*	0.647***	(0.086)	FE
Muslim x Girl	−0.285†	(0.163)	FE
Influence of Cross-Gender Friends			
Boy: Proportion Cross-Gender Friends	0.539*	(0.237)	FE
Girl: Proportion Cross-Gender Friends	−0.093	(0.273)	FE
Muslim x Boy: Proportion Cross-Gender Friends	1.820*	(0.815)	FE
Muslim x Girl: Proportion Cross-Gender Friends	0.784	(0.738)	FE

Note: $^{\dagger}p < .10$,$^{*}p < .05$,$^{**}p < .01$,$^{***}p < .001$; two-tailed tests. Posterior means and standard deviations of posterior means are Bayesian analogs to point estimates and standard errors. All covariates are centered. RE indicates random effects and FE indicates fixed effects.

Table E.3: Full Model Results for M3 of SAOM Analysis: Influence of Cross-Gender Friends and Adaptation to Friends' Gender Role Attitudes

	Posterior mean (SD)	
Evolution of Friendship Network		
Structural Network Effects		
Outdegree	0.756***	(0.176)
Reciprocity	1.755***	(0.051)
Transitive triplets	0.531***	(0.018)
Transitive reciprocated triplets	−0.216***	(0.025)
Indegree-popularity (square root)	0.082*	(0.040)
Indegree-activity (square root)	−0.244***	(0.051)
Outdegree-activity (square root)	−0.924***	(0.063)
Covariate Control Effects		
Same Ethnic Background	0.062†	(0.033)
Praying Frequency Alter	0.013	(0.013)
Praying Frequency Ego	0.006	(0.014)
Praying Frequency Similarity	0.053	(0.056)
ISEI Alter	0.008	(0.010)
ISEI Ego	−0.015	(0.011)
ISEI Similarity	−0.024	(0.070)
Selection Based on Gender Role Attitudes		
Gender Role Attitudes Alter	−0.009	(0.018)
Gender Role Attitudes Ego	0.001	(0.022)
Gender Role Attitudes Similarity	0.317***	(0.088)
Muslim Alter	−0.194***	(0.044)
Muslim Ego	−0.198**	(0.067)
Muslim Ego x Muslim Alter	0.405***	(0.069)
Girl Alter	−0.258***	(0.045)
Girl Ego	−0.518***	(0.056)
Girl Ego x Girl Alter	0.696***	(0.065)
Muslim Ego x Gender Role Attitudes Ego	0.022	(0.044)
Muslim Ego x Gender Role Attitudes Alter	−0.055	(0.038)
Muslim Ego x Gender Role Attitudes Similarity	−0.507*	(0.193)
Girl Ego x Gender Role Attitudes Ego	0.073	(0.050)
Girl Ego x Gender Role Attitudes Alter	0.033	(0.031)
Girl Ego x Gender Role Attitudes Similarity	−0.305*	(0.144)
Muslim Ego x Girl Ego	0.083	(0.098)
Muslim Ego x Girl Ego x Gender Role Attitudes Ego	−0.097	(0.096)

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Table E.3 *continued from previous page*

	Posterior mean (SD)	
Muslim Ego x Girl Ego x Gender Role Attitudes Alter	0.010	(0.054)
Muslim Ego x Girl Ego x Gender Role Attitudes Similarity	0.662*	(0.291)
Gender Role Attitudes Ego x Girl Ego	−0.006	(0.040)
Gender Role Attitudes Ego x Girl Ego x Girl Alter	−0.041	(0.062)
Muslim Ego x Girl Alter	−0.005	(0.092)
Muslim Ego x Girl Ego x Girl Alter	0.090	(0.133)
Gender Role Attitudes Ego x Muslim Ego x Girl Alter	−0.086	(0.088)
Gender Role Attitudes Ego x Muslim Ego x Girl Ego x Girl Alter	0.142	(0.132)
Evolution of Number of Egalitarian Gender Role Attitudes		
Control Effects		
Linear shape	0.302**	(0.108)
Quadratic shape	−0.016	(0.025)
Praying Frequency	−0.053*	(0.024)
ISEI	0.033†	(0.020)
Muslim *(Ref. Non-Muslim)*	−0.175	(0.123)
Girl *(Ref. Boy)*	0.548***	(0.097)
Muslim x Girl	−0.256	(0.173)
Adaptation to Friends' Attitudes		
Boy: Adaptation of Friends' Attitudes	−0.237	(0.388)
Girl: Adaptation of Friends' Attitudes	1.073*	(0.489)
Muslim x Boy: Adaptation of Friends' Attitudes	0.010	(0.651)
Muslim x Girl: Adaptation of Friends' Attitudes	−0.369	(0.783)
Influence of Cross-Gender Friends		
Boy: Effect of Proportion Cross-Gender Friends	0.483*	(0.246)
Girl: Effect of Proportion Cross-Gender Friends	0.017	(0.298)
Muslim x Boy: Effect of Proportion Cross-Gender Friends	1.833*	(0.791)
Muslim x Girl: Effect of Proportion Cross-Gender Friends	0.756	(0.810)

Note: $^{\dagger}p < .10$,$^{*}p < .05$,$^{**}p < .01$,$^{***}p < .001$; two-tailed tests. Posterior means and standard deviations of posterior means are Bayesian analogs to point estimates and standard errors. All covariates are centered. RE indicates random effects and FE indicates fixed effects.

Table E.4: Selection and Influence of Cross-Gender Friends on Gender Role Attitudes. Predictions from the SAOM Analysis: Any Cross-Gender Friends instead of Proportion of Cross-Gender Friends

Selection: Effect of egalitarian gender role attitudes on the tendency to make cross-gender friends

	M1: Overall Sample	M2: Non-Muslims	M2: Muslims	M2: Difference Muslims − Non-Muslims
Boys	0.033	0.044	−0.018	−0.061
	(0.037)	(0.044)	(0.074)	(0.086)
Girls	0.010	0.032	−0.071	−0.104
	(0.033)	(0.038)	(0.069)	(0.079)
Difference	0.023	0.012	0.054	
Boys – Girls	(0.050)	(0.059)	(0.101)	

Influence: Effect of any (rather than no) cross-gender friend on the tendency to hold egalitarian gender role attitudes

	M1: Overall Sample	M2: Non-Muslims	M2: Muslims	M2: Difference Muslims − Non-Muslims
Boys	0.336*	0.209	0.868**	0.660*
	(0.143)	(0.140)	(0.269)	(0.308)
Girls	0.056	−0.015	0.108	0.124
	(0.127)	(0.160)	(0.280)	(0.326)
Difference	0.280	0.224	0.760*	
Boys – Girls	(0.190)	(0.209)	(0.374)	

Note: $^{\dagger}p < .10$,* $p < .05$,** $p < .01$,*** $p < .001$; two-tailed tests. Posterior means and standard deviations of posterior means.

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