

# Hate Crimes and Gender Imbalances: Fears over Mate Competition and Violence against Refugees

Rafaela Dancygier\*   Naoki Egami<sup>†</sup>   Amaney Jamal<sup>‡</sup>   Ramona Rischke<sup>§</sup>

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## Abstract

As the number of refugees rises across the world, anti-refugee violence has become a pressing concern. What explains the incidence and support of such hate crime? We argue that fears among native men that refugees pose a threat in the competition for female partners is a critical but understudied factor driving hate crime. Employing a comprehensive dataset on the incidence of hate crime across Germany, we first demonstrate that hate crime rises where men face disadvantages in local mating markets. Next, we complement this ecological evidence with original survey measures and confirm that individual-level support for hate crime increases when men fear that the inflow of refugees makes it more difficult to find female partners. Mate competition concerns remain a robust predictor even when controlling for anti-refugee views, perceived job competition, general frustration, and aggressiveness. We conclude that a more complete understanding of hate crime and immigrant conflict must incorporate marriage markets and mate competition.

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\*Professor, Department of Politics and School of Public and International Affairs, Princeton University, Princeton NJ 08544. Email: rdancygi@princeton.edu.

<sup>†</sup>Assistant Professor, Department of Political Science, Columbia University, New York NY 10027. Email: ne2312@columbia.edu.

<sup>‡</sup>Professor, Department of Politics, Princeton University, Princeton NJ 08544. Email: ajamal@princeton.edu.

<sup>§</sup>Post-doctoral fellow, Berlin Institute for Empirical Integration and Migration Research, Humboldt University. Email: ramona.rischke@hu-berlin.de.

# 1 Introduction

Hate crime is on the rise. In the US, hate crimes hit a 16-year high in 2018 (Hassan, 2019). In Sweden, between 2008 and 2018 they grew by 20 percent, with Islamophobic crimes more than doubling. Xenophobic attacks have also been a pressing problem in Germany, with asylum seekers being a frequent target of vitriol and violence.<sup>1</sup>

What explains the incidence of and support for these crimes? Existing research points to the dislocations wrought by modernization and social change, or to more immediate triggers, including the inflow of ethnic and racial minorities and the cultural and economic conflicts it can unleash.<sup>2</sup> Notwithstanding the importance of these accounts, we highlight a heretofore understudied factor: the fear that the arrival of male outsiders presents a threat to native men in the competition for female partners. In particular, we argue that perceived *mate competition* can trigger hate crime against refugees.<sup>3</sup>

In many contexts, migrant populations feature skewed sex ratios (Dyson, 2012). This situation also characterizes the population that entered Germany during the mid-2010s, when over one million migrants, the majority of them young men originating from the Middle East, sought asylum. Much of the discussion surrounding this influx has centered around this group's cultural and economic integration challenges and on the security threats it may pose (Choi, Poertner and Sambanis, 2019; Hager and Veit, 2019; Ward, 2019). Somewhat below

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<sup>1</sup> See <https://www.bra.se> and Frey (2020).

<sup>2</sup> For reviews, see, e.g., Dancygier and Green (2010), Gerstenfeld (2017) and Section 2. On government responses, see Bleich (2011).

<sup>3</sup> Following common usage, we use the terms refugees and asylum seekers interchangeably.

the surface, however, Germans voice concerns that these young, single men are potential competitors on the dating and marriage market. As one blog post forewarned: the large-scale settlement of refugee men will make it very difficult for “hundreds of thousands of our sons to gain experience with the opposite sex...for many of them a fulfilling partnership may be blocked off completely.”<sup>4</sup>

Our study aims to show that these types of concerns help fuel anti-refugee hate crimes, and we do so in two ways. First, we demonstrate that anti-refugee hate crime is likely to occur in areas where native men face disadvantages in finding female partners. Employing a comprehensive dataset of violence against refugees in Germany, we observe that areas where men significantly outnumber women witness higher levels of anti-refugee hate crime, and this relationship holds controlling for a number of other structural factors.

Second, we test the micro-foundations underlying this association. The ecological analyses establish that areas where we would expect mate competition to raise the incidence of hate crime in fact do experience such offenses at higher rates. To pinpoint the individual-level mechanisms that sustain this correlation, we turn to original surveys that we fielded in Germany. We first show that perceptions of native-refugee mate competition rise in areas with excess males. Moreover, this relationship is especially strong among men that fall in the most mating-active age range. We then develop several variables probing support for hate crime and use list experiments to guard against potential social desirability biases. Using these measures, we find that perceived mate competition is a strong, independent driver of hate crime, even among those who already hold hostile views against refugees. Lastly, concerns

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<sup>4</sup> See <http://neuland.mustermann.org/migration>.

over mate competition remain a robust predictor of hate crime support when controlling for experiences that may be prevalent in areas where men are disadvantaged in mating markets, namely general dissatisfaction with life, aggressiveness, and labor market competition.

In exposing the connection between mate competition and hate crime, we make several contributions. First, by emphasizing the search for partners as a significant component of anti-refugee behavior, we incorporate theories of social dominance and mate selection into the study of hate crime and anti-migrant behavior more generally. These theories posit that when men's position is threatened by outsiders, so is their access to female partners, leading them to target male members of out-groups with discrimination and violence (Buss, 1988; McDonald, Navarete and Sidanius, 2011). Attacks against refugees, we argue, can fit this dynamic. By implication, our study speaks to a dilemma highlighted in other accounts (e.g., Olzak, 1992), namely that majority opposition against minorities rises when the latter are in fact integrating into majority settings and inter-group barriers begin to fall.

Second, we advance research relating competition over resources to anti-migrant behavior. Rather than investigating labor or housing markets, however, we focus on dating and marriage markets. We thus connect work on immigrant conflict (e.g., Adida, 2014; Dancygier, 2010; Homola and Tavits, 2018; Hopkins, 2010; Money, 1999) to debates about how the relative lack of women influences discriminatory behavior against migrants (Dyson, 2012; Klasen, 2009). In doing so, we propose that the role of dating and marriage markets should be more firmly integrated into accounts of immigrant conflict.

Third, we make important advances on the empirical front. Studies of neighborhoods afflicted with hate crime suggest that though only a minority commits these acts, perpetrators are empowered by more widespread attitudes favoring hate crime (e.g., Bowling, 1998; Pin-

derhughes, 1993). Yet these attitudes have not been systematically studied, and our paper is among the first to do so.<sup>5</sup> To ensure proper measurement, we conduct list experiments that alleviate concerns about under-reporting support, and we study these views at different points in time, using different samples, survey firms, and questions. Our study thus presents the most comprehensive investigation of attitudes towards anti-migrant hate crime to date.

We proceed by reviewing existing theories and introducing our argument. We next provide background information on recent immigration to Germany, illustrate how concerns over mate competition have entered public discourse, and then present our ecological and individual-level analyses. The conclusion discusses implications for policy and research.

## 2 Existing Explanations and Mate Competition

Anti-migrant hate crime is a long-standing global problem, but in Germany and elsewhere its incidence ebbs and flows across time and space (Egami, 2018; Jäckle and König, 2017; Marbach and Ropers, 2018). Why do some localities witness no hate crimes at all, while in others refugees become frequent targets of abuse? And why do some people support hate crime against outsiders while others don't?

Existing research<sup>6</sup> can be grouped into two broad approaches: investigations (1) of the structural factors that are conducive to hate crime and (2) of the characteristics of individual perpetrators. To foreshadow our approach, we integrate both by highlighting how one pre-

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<sup>5</sup> Zick, Küpper and Hövermann (2011) is one of the few surveys asking about the willingness to use violence against foreigners.

<sup>6</sup> This brief review focuses on hate crime against ethno-racial, not sexual, minorities.

viously understudied structural factor – dating and marriage markets – influences individual threat perceptions of refugees and endorsement of hate crime directed against this group.

## **2.1 Structural Conditions and Perpetrator Characteristics**

In focusing on mate competition and its contextual determinants, we introduce a new concept to the study of hate crime, but we build on existing work that has emphasized structural conditions. Several studies attribute hate crime to economic decline and unemployment, positing that ethnic outgroups become targets of xenophobic attacks because they serve as scapegoats for deteriorating economic conditions and are blamed for shortages in jobs or housing. Economic dislocation and competition can further trigger frustration which in turn can spur aggressive behavior, including hate crime (Dancygier, 2010; Pinderhughes, 1993). Another approach highlights demographic change. In the US, white residents have been shown to commit hate crimes against in-migrating Asians, Hispanics, and African Americans. This tendency is particularly pronounced in neighborhoods that were previously predominantly white, suggesting that a challenge to status dominance is potentially significant (Green, Strolovitch and Wong, 1998; Stacey, Carbone-López and Rosenfeld, 2011). Similarly, Marbach and Ropers (2018), focusing on Germany, demonstrate that local inflows of asylum seekers cause a rise in hate crimes against this group.

On the whole, both economic and demographic accounts have received mixed support (cf. Dancygier and Green, 2010). Some of this ambiguity arises due to intervening factors: economic decline or demographic change may raise support for hate crime, but actors and institutions moderate the relationship between latent support and actual offenses. For in-

stance, a permissive stance by the police or lawmakers can embolden potential perpetrators (Karapın, 2002; Wilkinson, 2006), whereas well-functioning local governments can reduce inter-group violence (Ziller and Goodman, 2020). Furthermore, some argue that far-right parties can stoke (Jäckle and König, 2017) or suppress (Koopmans, 1996) hate crime, and others highlight contagion and the role of the media in this process (Braun and Koopmans, 2009; Egami, 2018).

Notwithstanding these complex linkages, perpetrator types do map onto contextual features in that economic insecurity and ethnocentrism tend to distinguish hate crime offenders from the general population (Heitmeyer, 1992; Willems, 1995). By implication, the commission of hate crimes can follow expressive and instrumental motives. Targeting an outgroup with violence and abuse may generate psychic benefits for those who seek to establish superiority. Additionally, it can send a potent message to the outgroup – as well as to politicians – that outgroup members are to stay away. Studies have thus shown that perpetrators strategically deploy hate crime to keep outsiders from accessing “their” neighborhoods or housing (Back, 1996; Dancygier, 2010).

In doing so they don’t only respond to threats they perceive to their personal well-being, but to their larger community (family, friends, neighbors). Research (Bowling, 1998; Pinderhughes, 1993) accordingly argues that community support for hate crime propels potential perpetrators into action.

We extend this research in two ways: First, we assess the support base that helps motivate individual hate crime offenders with representative surveys. Second, we argue that another key motive driving hate crime lies in perpetrator communities’ desire to prevent outsiders’ access to “their” women.

## 2.2 Mate Competition

Though our study is one of the first to systematically introduce mate competition as a catalyst of anti-migrant hate crime, competition for romantic partners is a core element of human existence and group conflict that has been studied across disciplines (e.g., Arnocky et al., 2014; Becker, 1981; Guilmoto, 2012; Lichter et al., 1992; Sidanius and Pratto, 1999). Mate competition also features prominently in social dominance theory (SDT). Based on an evolutionary approach emphasizing males' reproductive needs, SDT predicts that men are more likely than women to be the agents and targets of prejudicial behavior. This asymmetry arises because reproductive differences lead males to invest less time in raising offspring than females. As a result, men are expected to pursue a mating strategy based on *quantity*, whereas females pursue one of *quality*. It follows, then, that men, more so than women, engage in “risky, aggressive, and often dangerous strategies for eliminating or neutralizing same-sex competitors in order to increase [their] mating acces” to women (McDonald, Navarete and Sidanius, 2011, 192).<sup>7</sup>

We argue that hate crime targeted against refugees can in part be motivated by this desire. We consider the competition for mates to be one type of resource conflict that can emerge in the wake of predominantly male immigration and that is particularly likely to manifest itself between native and immigrant men. Unlike existing accounts that examine competition over material goods, we focus on romantic relationships as the contested resource. If German women had encountered predominantly female migration, they would potentially also experience an increase in mate competition, with similar (albeit, according

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<sup>7</sup> See also Buss (1988) and Sidanius and Pratto (1999).

to SDT, less severe) implications for hate crime support. None of the counties during our study period experienced predominantly female refugee migration (see Appendix C.10). Our discussion therefore centers on mating threats as experienced by men, but we also do not rule out sociotropic concerns whereby individuals support hate crime due to partner competition experienced by the opposite sex, relatives, or friends.<sup>8</sup>

We begin with the assumption that, all else equal, a local mating pool with a disproportionate number of men will make it more difficult for heterosexual men to find female partners. The relationship between excess men and marriage markets has received attention in parts of the world where a preference for sons and associated sex-selective neglect and abortions have generated skewed sex ratios (cf., Dyson, 2012; Guilmoto, 2012; Klasen, 2009). Distorted sex ratios can also result from internal migration. Mirroring trends in other advanced economies, German women have been more likely to move to cities, leading to excess men in peripheral and rural regions. Women’s relatively higher educational aspirations and their specialization in service jobs (vs. males’ disproportionate employment in manufacturing) are some of the factors that help drive internal migration with respect to post-unification east-west movements, within Germany as a whole, and cross-nationally (Eckhard and Stauder, 2018, for a discussion see Appendix A.1).<sup>9</sup>

These imbalances have implications for mate competition, which have been addressed by popular media and regional governments. TV documentaries (e.g., “Tell me where the women are”, “Alone in the North”) and newspaper articles highlight the plight of young

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<sup>8</sup> Results in Section 4 hold when subset to men only.

<sup>9</sup> Our ecological analysis controls for structural factors associated with gender imbalances.

Appendix Tables C.6 and D.5.2 include east-west interactions.

men unable to find partners and start families. Facing shrinking female populations, governments and think tanks have studied how to make their regions more attractive to women (Appendix A.1 contains further information and sources).

That areas characterized by excess males produce higher levels of mate competition is thus a salient local issue. Moreover, we posit that these men should be more primed to perceive male newcomers as competitors in the mating market, and we apply this logic to refugee inflows and associated refugee-native conflicts. The fact that eastern states are often the site of anti-refugee hate crimes potentially speaks to this dynamic. This increased incidence is often attributed to higher levels of xenophobia in the East. We concur, but we also probe to what extent excess males and related fears over mate competition are part of the explanation, even while controlling for xenophobia.

Additionally, immigration can skew pre-existing unbalanced sex ratios even further and squeeze mating markets in the process. Sizable shares of recent refugees have been unmarried men, which further exacerbates mate competition, especially if German men perceive refugee men as credible threats. As we will show below, a significant number of Germans do in fact believe that refugees have made it more difficult for German men to find female partners. In this way, the current situation in Germany reflects a more general phenomenon whereby male members of ethnic outgroups are feared and sometimes attacked for their perceived romantic relationships with ingroup women (e.g., Belchem, 2014; Ryan, 2006).

Our argument encompasses both real and perceived mate competition. Marriages between German women and non-German men have increased,<sup>10</sup> and it is also true that refugees

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<sup>10</sup> Between 2007 and 2016, they rose from 18,608 to 21,375, accounting for five percent of new marriages (Statistische Ämter des Bundes und der Länder, 2019); in relative terms

have dated German women. Yet perceptions of these developments can be distorted. While 5.2 percent of new marriages in 2016 were between a German woman and a non-German man, around one third of Germans think such marriages are common, and close to 5 percent think they are very common.<sup>11</sup>

We thus assume that some men will endorse or commit hate crime against refugees because they or someone they know have personally been affected by refugee-native mate competition, while others will do so because they perceive refugee-native mate conflicts without necessarily having had direct experience. As we highlight in the next section, news sources and social media have disseminated the idea that male refugees are partnering up with German women, fueling perceptions of refugee-native mate competition.

Lastly, our argument is distinct from – but relates to – claims about native men’s desire to protect the honor and safety of women from “predatory” immigrant men. This trope is prominent in Germany (e.g., Dietze, 2016) and elsewhere (e.g., Ryan, 2006).<sup>12</sup> Nonetheless, there are reasons to doubt its sincerity, at least as articulated by far-right groups. Attitudes towards women among right-wing extremists are usually quite misogynistic, and violence against women is not problematized (Bitzan, 2016; Dancygier, 2020). Tellingly for our account, when far-right forces present immigrant men as sexual predators, they frequently make possessive claims to “their” women. This phrasing, especially when coupled with far-right misogyny, suggests that the “protection” argument could also be a veiled, more socially

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these numbers have remained stable.

<sup>11</sup> Figures are based on a YouGov survey we discuss in Section 4.2.

<sup>12</sup> The portrayal of refugees as sexual predators intensified after reports of sexual abuse of German women by refugee men on New Year’s eve 2015-16 (Frey, 2020).

acceptable reference to the “they-steal-our-women” argument. Emphasizing protection allows far-right actors to appeal to mainstream audiences while simultaneously signaling to potential supporters that migrants pose a threat on the partner market. In short, though we do not rule out that some may engage in anti-migrant behavior to protect women from feared sexual attacks, we propose a mechanism that highlights men’s access to women and note that these two frames may complement one another.

Before moving to our own analyses, the next section illustrates that discussions about refugees pursuing romantic relationships with German women, and the potential refugee-native mate competition that can ensue, have been a topic of public debate.

### **3 Refugees and Mate Competition: A Topic of Debate**

Germany has a large immigrant population, consisting mainly of labor and family-based migrants as well as those seeking asylum.<sup>13</sup> In recent years, the inflow of asylum seekers has been especially large. From 2015 to 2017, officials registered nearly 1.4 million asylum applications, with well over half made by individuals from Syria, Iraq, and Afghanistan (Bundesamt für Migration und Flüchtlinge, 2019). In addition to being disproportionately Middle Eastern in origin, this population is also mostly male, young, and single. In 2016, 64% of refugees were male; among males 62% were between the ages of 15 and 40, and 68% of refugees were not married (Destatis, 2018).

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<sup>13</sup> In 2017, 19.3 million of Germany’s 81.7 million residents living in private households had a migration background; among this group, 13.2 million were born abroad (Bundesamt für Migration und Flüchtlinge, 2019).

With respect to case selection, this composition makes Germany a plausible test case for our theory, but it also means that future research should investigate whether our findings travel to groups that are less ethnically distinct, less sexualized (see below), and also where media coverage has been less intense.

The recent refugee influx has indeed been a salient topic. While the initial tenor was welcoming, the mood shifted after several months of sustained inflows and incessant media coverage, along with heated rhetoric and gains by the anti-immigrant Alternative für Deutschland (AfD). The incidence of hate crime spiked as well. In 2015, 1,249 anti-refugee hate crimes were documented, and in 2016, this number climbed to 3,769 (for data sources, see Section 4 and Appendix B).

This spike was accompanied by continuous debate about integration challenges. While the inflows' impact on the national culture, economy and public safety dominated discussion, another theme centered on relationships between refugee men and German women. Mainstream sources raised awareness of these relationships in a rather benign way, but right-wing observers recast them in a threatening light (see Appendix A.2 for sources). For example, mainstream print and TV media ran human interest stories about refugee boys/men dating German girls/women, and widely covered so-called “flirt-classes”, meant to promote integration via understanding social norms and romantic partnerships. YouTube clips about these classes, viewed thousands of times, have been “disliked” much more frequently than they have been “liked,” and have received scathing commentary.<sup>14</sup> They are mocked and criticized on Twitter, including by the AfD, and have triggered hostile reactions. A prominent

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<sup>14</sup> <https://www.youtube.com/xvriMBbzb5E> and [https://www.youtube.com/G37K8\\_y9HBI](https://www.youtube.com/G37K8_y9HBI).

“flirt coach” required police protection due to verbal abuse and death threats from individuals accusing him of helping refugees “steal our girls” (e.g. Charter, 2017). This reaction, while extreme, is consistent with a generalized sense of threat among some. A newspaper listed the idea that refugee men are interested in local women as one prominent concern voiced by Germans in response to refugees settling in town (Keller, 2014), while a state-level branch of the German Teacher’s Union published a widely-discussed article warning against “sexual adventures” between schoolgirls and “attractive refugee men” (Zeit Online, 2015).

Far-right websites routinely draw on such media coverage, putting their own spin on it and raising the specter of mate competition threats posed by male refugees who further aggravate existing gender imbalances. A number of articles on *Neuland*, for instance, explicitly refer to German women as a scarce resource and lament that “Politics and the state currently award the indigenous resource ‘woman’ to strangers.”<sup>15</sup> The website *Politikversagen* (“Failure of Politics”), which curates immigration-related stories from across the web, features an article by a national newspaper on refugees who want to meet German girls. The newcomers are said to have a comparative advantage precisely because their cultural difference makes them “more interesting.”<sup>16</sup> An article appearing on another far-right site is similarly concerned that German men are losing out on the dating scene: “[E]very inhabitant of a medium or large German city can currently observe with surprising frequency that local girls are romantically involved with asylum-seekers...What drives so many girls and women to do this?” Posted on Facebook, among the top stated reasons (and speaking to the intersection of eroding masculinity and far-right extremism (e.g., Kimmel, 2018)) was the idea that women

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<sup>15</sup> <http://neuland.mustermann.org>.

<sup>16</sup> <http://www.politikversagen.net>.

are attracted to refugees' "raw, undisguised masculinity" which stands in stark contrast to "German 'gender-sissies'."<sup>17</sup>

Likening the situation to China and India, where "missing women" have resulted in acute marriage squeezes, a right-wing site warns that Merkel's open invitation (*Einladungspolitik*) of mostly male refugees will have an "immediate and massive" effect on German sex ratios. This male surplus will push German men to "the margins of society...they cannot build families and can only experience their sexuality in a very limited way."<sup>18</sup> An article on another site is even more alarming: "One million young men, without the corresponding women, and soon two, three or ten million young men, present an excruciating sexual emergency that poses real dangers to society and the state."<sup>19</sup> With possibly greater reach, an AfD politician countered a call for pro-migrant policies by stating "You may change your mind when all women who you find attractive are in a relationship with migrants."<sup>20</sup>

In sum, the notion that male refugees are engaged in romantic relationships with German women has received considerable media attention from a variety of sources, with coverage ranging from the curious to the outright hostile. We argue that the prospect of refugee-native mate competition can trigger or compound resentment against refugees, including support for hate crime.

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<sup>17</sup> <http://jürgen-damm-nachrichtenverteiler.de>.

<sup>18</sup> <https://www.wissensmanufaktur.net>.

<sup>19</sup> <https://www.tichyseinblick.de>.

<sup>20</sup> <https://twitter.com/AndreasWildAfD/status/835615693252984833>.

## 4 Empirical Analyses

### 4.1 Mate Competition and the Incidence of Anti-Refugee Hate Crime

If perceived mate competition is one component in the production of anti-refugee hate crime, we can make predictions about *where* it is likely to occur. In particular, we propose that where native men are disadvantaged in local mating markets and in a context where sizable shares of refugees are unmarried men, as is the case throughout Germany during our study window, the incidence of hate crime should rise, all else equal. In this section we provide ecological evidence of such relationships at the municipality level. We do not causally isolate the effect of mate competition – our goal in this section is instead to show that hate crime rises where we expect it to rise if mate competition is a determinant of anti-refugee hate crime.<sup>21</sup> Section 4.2 then turns to mechanisms by investigating the individual-level underpinnings of these ecological relationships.

To operationalize mate competition we use the sex ratio (our theory is confined to heterosexual relationships), which encapsulates the potential for mate competition and does so without making assumptions about mate preferences beyond sexual orientation. We assume

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<sup>21</sup> We looked into examining our results in municipalities that restrict labor market access to refugees (this would rule out job competition as an alternative mechanism) but found that restrictions correlate significantly with several variables, including sex ratios and unemployment rates. In another robustness check, we turn to placebo analysis; see Appendix C.9.

that where men outnumber women, men will compete more fiercely for female partners, and some will be left partnerless. We measure the sex ratio – *Excess Males* – by dividing the number of men by the number of women among those aged 15–44 at the municipality level (results are robust to different age ranges (see Appendix C.2) and are not driven by refugee inflows (see footnote 24 for all controls)).

Though most hate crime perpetrators are under 30 years of age, we use an expanded age range. First, this range captures competition within and across age groups: when men in older cohorts face a shortage of similar-aged women, they often seek out women in younger cohorts (Edlund, 1999; Kröhnert and Klingholz, 2007). Second, the expanded age range measures the broader mating context into which potential perpetrators have been socialized. Having grown up in areas that women have been leaving behind and where men have consequently struggled to find partners likely primes young men to think of mating challenges. Finally, as mentioned in Section 2, perpetrators not only act to defend their personal interests but also those of their peer group and larger community.

Our dependent variable is the incidence of hate crime at the municipality level and is provided by “*Mut gegen rechte Gewalt*” (“Courage against right-wing violence”), a dataset jointly produced by the Amadeu Antonio Foundation and PRO ASYL. Covered incidents include: (1) arson attacks against refugee housing; 2) other attacks against refugee housing (e.g. vandalism); and 3) physical attacks against refugees.

To the best of our knowledge, these data present the most comprehensive collection of publicly-reported attacks against refugees. Sources include reports by local police, the press, victim organizations, regularly published reports by the German Federal Office of Criminal Investigations (BKA), as well as government responses to parliamentary inquiries (i.e., MP

questions to the government about hate crime). While, on its own, each source has its limitations, the use of a wide range of sources and of fairly narrowly defined categories is expected to minimize reporting biases. We provide additional details on the reliability of this data source in Appendix B.

Nonetheless, like most analyses of hate crime, we must assume that these crimes are under-reported, and we cannot test for the factors that lead to under-reporting.<sup>22</sup> As a partial check, we re-estimate the analyses below on the incidence of physical attacks only (see Appendix C.4), which, given their severity, are more likely to be registered than are acts of vandalism, for example. Our individual-level survey examining hate crime support does not face these limitations.

Though anti-refugee hate crime shot up significantly in 2015-6, the majority of municipalities do not observe such crimes. In 2015, 5.6% of municipalities witnessed at least one hate crime; in 2016 and 2017 these numbers were 12.1 and 6.8%, respectively. In light of this distribution, our main dependent variable is dichotomous and measures whether a municipality reported one or more hate crimes (in 2015, 2016, and 2017). (Results are similar when we examine the number of incidents using a negative binomial model; see Appendix C.5). We estimate two types of models, one in which we aggregate anti-refugee hate crimes over this three-year period (municipalities are coded 1 if they experience at least one hate crime in this period (zero otherwise); this applies to 17% of municipalities), and a panel model based on the same dichotomous coding for annual observations.

Figure 1 demonstrates that hate crimes are more likely to occur in municipalities that

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<sup>22</sup> We discuss potential biases due to under-reporting in Appendix B.

feature a surplus of men.<sup>23</sup> This effect holds with a number of contextual controls that could correlate with skewed sex ratios and drive their effect on hate crime as well as county and year fixed effects included.<sup>24</sup>

Results in the right-most panel suggest that when moving from a municipality where men and women are evenly balanced to one where there are 120 men for every 100 women (corresponding to the 80th percentile of *Excess Males*), the probability of observing at least one hate crime rises by between 2.60 (95% CI = [.88, 4.19]) and 1.70 points (95% CI = [0.85, 2.52]). Since a relatively small number of municipalities are the site of reported anti-refugee hate crime, this is a substantively important effect. The left-most panels of Figure 1 plot these effects across the range of *Excess Males* and likewise show that locations where men outnumber women are more vulnerable to hate crime. The figure also illustrates that *Excess Males* varies widely across German municipalities. Though localities in the East are, on average, more likely to have a surplus of young men, the range in western states is also quite large, and the effect of *Excess Males* is not driven by locations in the East (see Appendix C.6). In other words, skewed sex ratios and resulting mate competition are generally associated

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<sup>23</sup> We exclude observations with extreme *Excess Males* values (the top/bottom 2.5 percentiles). These are mainly municipalities with very small populations (the median population of excluded municipalities is 247). Our results are not sensitive to this exclusion.

<sup>24</sup> These controls are: population, population density, population change, unemployment rate, ratio of male to female unemployment rate, number of refugees (stock), change in refugee population (flow), percent highly educated, percent manufacturing, change in percent manufacturing, AfD vote share, and violent crime per capita. See Appendix C.11 for variable definitions.

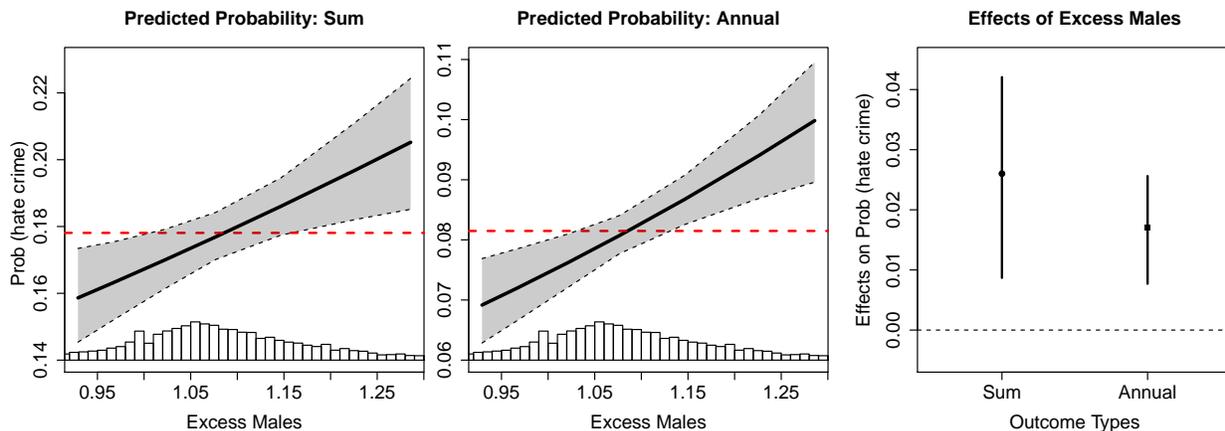


Figure 1: The Effect of Excess Males on the Predicted Probability of Observing at least One Hate Crime. *Note:* Logistic regression with standard errors clustered at the county level (see Appendix C.1 for the full results and specification). *Sum* equals one if a municipality witnessed at least one hate crime over the three-year period, and zero otherwise (the unit of analysis is the municipality). *Annual* equals one in a given year if a municipality witnessed at least one hate crime in that year, and zero otherwise (the unit of analysis is the municipality-year). In the left two panels, the histograms present the distribution of *Excess Males*. The dotted lines indicate the means of each outcome type. The right-most panel depicts the effect of changing *Excess Males* from 1 (no imbalance) to 1.2 ( $\approx$  80th percentile). Results hold using a linear probability model (see Appendix C.3).

with anti-refugee hate crime, and their regional distribution can also help explain why we observe a relatively higher incidence of anti-refugee violence in the East.

Finally, the impact of *Excess Males* is sizable when compared to frequently-studied structural factors: when changing each variable from the 20th to the 80th percentile, the effect of *Excess Males* is more than half of the effect of the unemployment rate, and more than twice the effect the share of highly educated residents (based on results in Appendix C.1).

One possible objection to the analysis thus far is that a surplus of men will be conducive to *all* types of violence, not just that of the xenophobic type (e.g., Hesketh and Xing, 2006). The above models therefore control for violent (non-xenophobic) crime, but we also address this concern by introducing an alternative measure of mate competition. In Germany women

tend to prefer men who are at least as economically successful as they are, and men of lower socioeconomic status hence find it more difficult to find female partners (Kröhnert and Klingholz, 2007). We measure this type of *Male Disadvantage* by dividing the male by the female unemployment rate. Note that *Excess Males* and *Male Disadvantage* are distinct phenomena and empirically not correlated ( $r = -.025$ ). In Appendix C.8, we show that this alternative measure produces similar results: In areas where men do less well economically than women and consequently face a mating disadvantage, anti-refugee hate crime is higher (we control for overall unemployment).

We also examined whether *Excess Males* and *Male Disadvantage* had larger effects on hate crimes in areas that received more refugees (refugee data are released at the county, not the municipality, level), and results are mixed. Though interaction effects were frequently positive, they were often imprecisely estimated. This may be due to coarse measurement at the county vs. the municipality level; because we are examining hate crime when the number of refugees rose across the board; and when the settlement of refugees was discussed nationwide, priming individuals to notice this inflow locally irrespective of its size.<sup>25</sup>

Summing up, our ecological evidence introduces mate competition as an important element in anti-migrant violence. The aggregate relationships demonstrate that areas in which mate competition is comparatively high also witness a higher incidence of anti-refugee hate crime. This finding holds up using two different indicators of potential mate competition, and it is robust to the inclusion of a variety of contextual controls and model specifications

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<sup>25</sup> See Hopkins (2010) on how local demographic change coupled with media coverage can shape anti-migrant behavior.

(see Appendix C). To bolster our argument that worries about mating prospects propel some to support violence against refugees, we next turn to individual-level attitudes.

## 4.2 Mate Competition and Support for Anti-Refugee Hate Crime

The above correlations suggest that mate competition can incite hate crime, but they cannot speak to two central questions that we address now: Are people who live in areas in which men face greater hurdles in the mating market actually more likely to perceive competition between German and refugee males? And do perceptions of such mate competition predict support for hate crime?

An online survey that we fielded in Germany helps us answer these questions. The survey consists of four waves (from September 2016 to December 2017) and was carried out by the survey firm Respondi. Each wave was designed to be nationally representative on age (starting at 18), gender, and state (*Bundesland*) and had an approximate  $N$  of 3,000 (for more details, see Appendix D.1). As part of this survey, we developed an item gauging perceived mate competition that we administered in Wave 4, asking respondents whether they (1/2) disagree strongly/somewhat, (3/4) agree somewhat/strongly with the following statement:

*Mate Competition:* The inflow of refugees makes it more difficult for native men to find female partners.

For ethical reasons, we decided against experimentally manipulating the salience or presumed incidence of mate competition – we do not want to trigger increases in perceived mate

competition if they lead to greater hate crime support.<sup>26</sup> We instead present descriptive data showing that the distribution of *Mate Competition* and its relationship with other variables indicate that this item is capturing a distinct attitude about refugees' impact on mating markets.

We first connect our ecological findings to individual-level attitudes. Figure 2 displays the proportion of respondents who believe that the inflow of refugees has made it more difficult for native men to find female partners, broken down by terciles of *Excess Males* (the data come from Wave 4). The leftmost panel, which covers all respondents, shows that this proportion rises from .18 to .22 when moving from the lowest to the highest tercile. The center panel only includes men between the ages of 18 and 44, the age range we used to construct *Excess Males* and when dating and marriage are likely salient. The rightmost panel restricts the age to 30-40, the range during which marriage concerns are particularly relevant (in 2017, men's mean age at first marriage was 34.1 in Germany). If a connection exists between perceived mate competition and sex ratios, these men should be more acutely aware of it, which our data indeed bear out. When moving from the first to the third tercile of *Excess Males* the proportion of men between the ages of 18 and 44 who perceive mate competition rises by a substantial two thirds, from .23 to .38. Even more striking, among

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<sup>26</sup> We also opted against testing whether a *decreased* salience reduces support because, in a separate project, we found that primes highlighting the costs of hate crime (economic and in terms of trauma among refugees) can potentially raise hate crime support among a subset. Given these troubling results, we decided not to go forward with these or other manipulations.

men for whom, based on their age, forming stable partnerships is most likely a priority, these proportions nearly triple, going up from .17 to .47.

Notably, it is not the case that these correlations are simply driven by general anti-refugee sentiment in areas that lack women. When we examine the patterns in Figure 2 only among respondents who express a high degree of hostility against refugees, we observe similar trends across terciles of *Excess Males* (see Appendix D.2).

In short, individuals who live in areas where men are disadvantaged in mating markets are more likely to perceive refugees as mating threats, and this relationship is especially strong among men that fall in the most mating-active age range.

We next assess whether agreement with *Mate Competition* represents a distinct response compared to views about other aspects (e.g., cultural, crime-related, economic) of the refugee inflow. If responses to *Mate Competition* aren't simply a knee-jerk anti-refugee reaction, variables that underlie mating concerns should predict *Mate Competition*, but they should not necessarily predict other refugee-related attitudes as well. We therefore test whether being a single male is associated with *Mate Competition* and also whether respondents who are concerned about shifting gender roles negatively affecting marriage and motherhood (*Women's Role*) are more anxious about additional mating competition with refugees.<sup>27</sup> We

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<sup>27</sup> This question asks whether respondents agree that “women should take their role as wife and mother more seriously.” The intuition is that those who agree will already perceive a diminished pool of potential wives and mothers available to German men. They should therefore be more likely to connect an increase in the male population (via refugee inflows) with native men's dating chances.

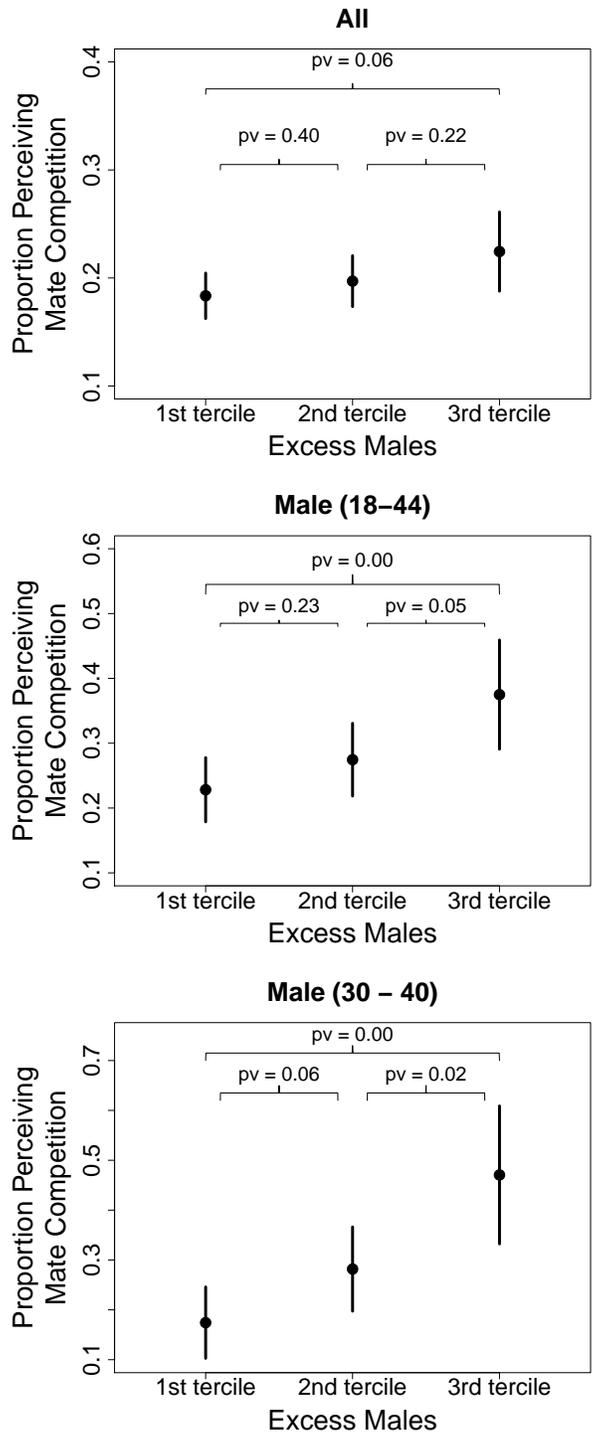


Figure 2: Individuals Living in Municipalities with a Higher Degree of *Excess Males* Perceive More Mate Competition. *Note:* We represent the proportion of respondents who agree that the inflow of refugees makes it more difficult for native men to find female partners (with 95% confidence intervals) across terciles of *Excess Males*. The panels include all respondents and male respondents aged between 18 and 44/30 and 40, respectively.

find that being a single male and *Women's Role* significantly predict *Mate Competition*, even when controlling for 17 other refugee-related views.<sup>28</sup> By contrast, these two variables are more weakly (or not at all) associated with answers to the 17 other refugee-related items (see Appendix D.3 for results and items).

To recap, the distribution of *Mate Competition* and its relationship with other variables gives us confidence that this item is measuring a distinct attitude about refugees' impacts on mating markets.

We now probe whether individuals who believe that refugees undermine native men's mating chances are more likely to support engaging in violence against this group. To do so, we developed a battery of hate crime support items. The first four signal a goal orientation – the use of hate crime to achieve certain outcomes and reach certain audiences<sup>29</sup> – whereas the last one refers to elite sanctioning of hate crime (answers include: (1/2) strongly/somewhat disagree and (3/4) somewhat/strongly agree; *Condemn* is reverse-coded):

*Only Means*: When it comes to the refugee problem, violence is sometimes the only means that citizens have to get the attention of German politicians.

*Message*: Attacks against refugee homes are sometimes necessary to make it clear to politicians that we have a refugee problem.

*Justified*: Hostility against refugees is sometimes justified, even when it ends up in violence.

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<sup>28</sup> The single-male interaction is also positive and significant when controlling for socio-demographic variables.

<sup>29</sup> See, e.g., Dancygier (2010) and Karapin (2002) on these communicative functions.

*Prevent*: Xenophobic acts of violence are defensible if they result in fewer refugees settling in town.

*Condemn*: Politicians should condemn attacks against refugees more forcefully.

One concern, and perhaps the reason why surveys have not included hate crime support measures, is that respondents do not answer questions truthfully. Online surveys guarantee a greater degree of anonymity than do face-to-face or phone interviews and are therefore more likely to elicit sincere responses on sensitive topics. Nonetheless, to guard against social desirability biases we employed list experiments. We included list experiments at the pilot stage, in Wave 1, and in Wave 2. For the sake of brevity we present results from Wave 2 here (Appendix Figure D.4.1 includes details on Wave 1). We divided fifty percent of our Wave 2 sample into a control and a treatment group. The control group was presented with three statements that are unrelated to hate crime.<sup>30</sup> The treatment group was exposed to the same statements plus the hate-crime-support item *Only Means*. Respondents in each group were then asked with how many statements on the list they agreed. The intuition is that respondents who feel social pressure to disguise their true support for hate crime when asked directly may be more willing to express their support using this indirect format (cf., Blair and Imai, 2012). By implication, if the mean of responses in the control group is lower than that in the treatment group, we have an estimate of the proportion of respondents

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<sup>30</sup> (1) When it comes to company policy, it's acceptable for companies that make large profits to lay off their workers, even if this increases unemployment; (2) Taking time to relax, even if only for a few minutes a day, is very important in this fast-paced and hectic world; (3) I expect German agriculture to produce safe and high-quality foods.

who condone hate crime. Finally, respondents that were not part of the list experiment or that were in the control group (i.e., 75% of the entire sample) were asked the *Only Means* question directly.

On the whole, we do not find evidence that respondents hide their support for hate crime. Comparing means in the control (1.94) and treatment group (2.09), we conclude that approximately 15% of respondents support anti-refugee violence. When we ask this question directly, this number is 18%, an insignificant difference (see Figure 3). Moreover, the mean answers to the other goal-oriented hate crime questions are very similar, while slightly more respondents disagree that politicians should be more forceful in their condemnation of anti-refugee violence. Finally, when we use a different hate crime item (*Message*, see Appendix Figure D.4.2) in the list experiment in Wave 1, we observe the same trend: respondents do not underreport their support for hate crime. In short, we disturbingly find that a sizable share of respondents condones violent acts against refugees and is not afraid to say so.

Does this support rise when individuals perceive refugees as mating threats? To address this question we estimate the effect of *Mate Competition* on hate crime support, controlling for leading alternative explanations. Specifically, we include two variables that measure sentiments that could be prevalent in areas that feature surplus men and that could also raise support for hate crime. First, these areas may have higher labor market competition among young men, including for apprenticeships, which are an important entry point to German labor markets. Accordingly, we ask respondents whether they agree that “the inflow of young male refugees makes it more difficult for young native men to find apprenticeships and jobs” (*Job Competition*; 4-point scale). Second, living in areas in which women are scarce may generate a general sense of dissatisfaction, which could be conducive to outgroup violence.

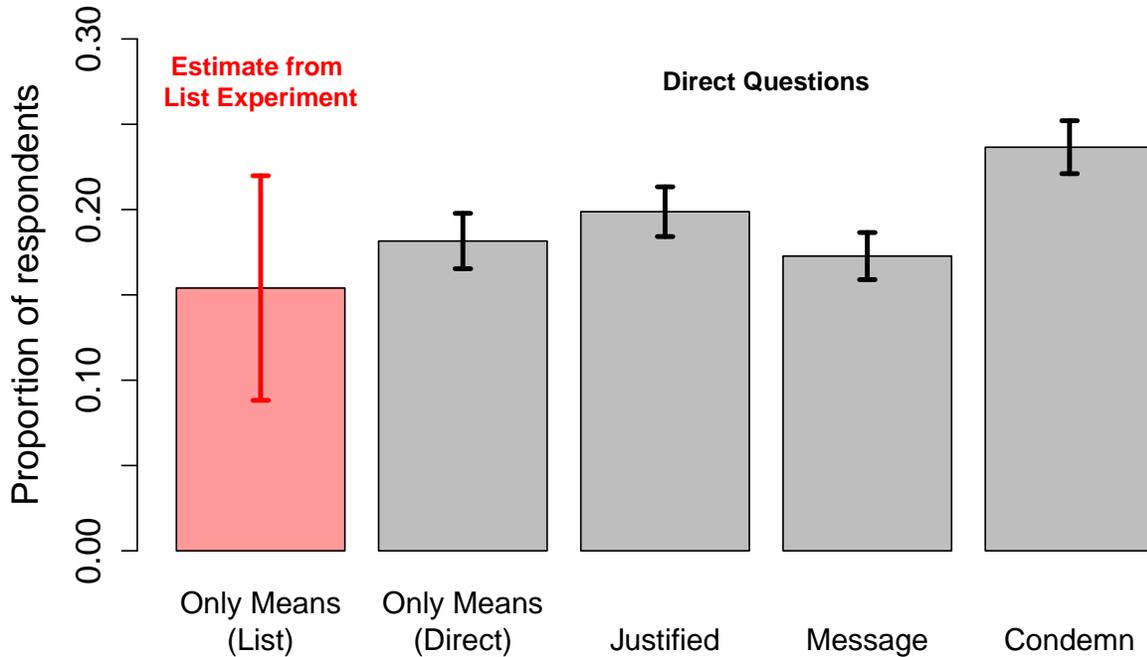


Figure 3: Proportion of respondents who agree with each of the four hate crime statements in Wave 2. *Note:* We conducted a list experiment containing *Only Means*, and we also directly asked a different subset of respondents about their agreement with this statement. Error bars indicate 95% confidence intervals. *Condemn* is reverse-coded.

We therefore pose the following question: “All things considered, how satisfied are you with your life as a whole nowadays?” (*Life Satisfaction*; 0-10 scale, ranging from extremely dissatisfied to extremely satisfied). Moreover, we incorporate individuals’ assessment of the economic, cultural, political, and social consequences and desirability of refugees for Germany as a whole and their municipality (variable descriptions are in Appendix D.6).

Table 1 demonstrates that individuals who perceive *Mate Competition* are more likely to support the idea that violence is sometimes the only means that citizens have to get the attention of politicians. This effect remains when controlling for *Job Competition* and *Life Satisfaction*, and the *Mate Competition* coefficient is also quite sizable in comparison. Furthermore, results hold when several socio-demographic controls are included (third col-

	Dependent variable (OLS): Violence is sometimes the only means					
Mate Competition	0.437*** (0.016)	0.263*** (0.020)	0.236*** (0.021)	0.206*** (0.019)	0.185*** (0.019)	0.155*** (0.019)
Job Competition		0.250*** (0.019)	0.236*** (0.019)	0.077*** (0.020)	0.065*** (0.020)	0.056*** (0.019)
Life Satisfaction		-0.015** (0.006)	-0.014* (0.007)	-0.003 (0.006)	-0.002 (0.006)	-0.0001 (0.006)
Socio-Demographics			✓	✓	✓	✓
Attitudes toward Refugees (National)				✓	✓	✓
Attitudes toward Refugees (Local)					✓	✓
Additional Controls						✓
Observations	3,019	3,019	3,008	3,008	3,008	3,008
R <sup>2</sup>	0.191	0.240	0.288	0.394	0.410	0.459
Adjusted R <sup>2</sup>	0.191	0.240	0.267	0.371	0.382	0.431

Note:

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table 1: Mate Competition Predicts Support for Hate Crime. *Note:* OLS with standard errors in parentheses (results are very similar when using ordered logit). The dependent variable is *Only Means*, and the main independent variable is *Mate Competition* (both range from (1) disagree strongly to (4) agree strongly).

umn).<sup>31</sup> In columns 4 and 5, we add a battery of variables measuring respondents' views about the national and local repercussions of refugees. The inclusion of these reduces the coefficient of *Mate Competition* only somewhat (by about one fifth), and it remains significant at  $p < .001$ . Finally, even when we take into account variables that may both drive perceptions of mate competition and support of hate crime (i.e., self-reported public contact with refugees, estimated closeness to refugee shelters, estimated number of refugees living in town, views about and closeness to the AfD, left-right ideological placement, and attitudes toward Muslims), the strong positive association between *Mate Competition* and support for

<sup>31</sup> These are: age, gender, education, income, main economic activity, employment status, German citizenship, household size, self-assessed social status, religious affiliation, state of residence.

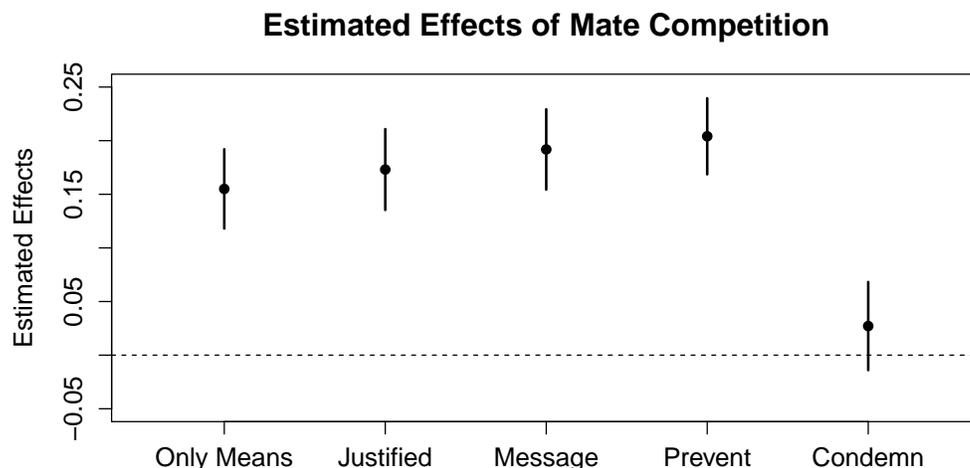


Figure 4: Estimated Effects of Mate Competition on Support for Hate Crime. *Note:* Outcome variables range from 1 to 4 with higher values corresponding to stronger hate crime support (or stronger opposition to elite sanctions). The main predictor, *Mate Competition*, ranges from (1) disagree strongly to (4) agree strongly. For each outcome, we present the effect of changing *Mate Competition* by one unit. Results are based on the specification as shown in Table 1 column 6 (with varying dependent variables).

hate crime remains.

Figure 4 shows that the effect of *Mate Competition* (based on specifications as in column 6, Table 1) on *Only Means*, *Justified*, *Message*, and *Prevent* is also positive and precisely estimated. Concerns that the inflow of refugees undermines native men’s mating prospects consistently predict support for xenophobic acts against refugees. *Mate Competition* has a smaller and weaker effect on the view that politicians should condemn hate crime more forcefully. Respondents thus do not seem to react similarly strongly when being asked about a statement that does not attribute some goal to xenophobic acts and instead comes closer to a value judgement (however, *Mate Competition* does significantly predict *Condemn* in models corresponding to columns 1-5 of Table 1).

The evidence presented thus far provides strong support for the argument that perceived refugee-native mate competition plays a role in the commission and support of anti-refugee

violence. To further substantiate this claim, we conduct two additional tests. First, we replicate our main survey results using a different sample and polling firm. Though we reduce panel conditioning by asking the *Mate Competition* item only in Wave 4, we administered the hate crime items several times in conjunction with different list experiments to make sure that we receive sincere answers. We therefore estimate the effect of *Mate Competition* on *Only Means* on a different pool of respondents overseen by YouGov. Additionally, this YouGov survey was carried out during a different time (May 2018) than the Wave 4 Respondi survey (December 2017), which ensures that our findings are not driven by events specific to the fielding dates. Employing this different sample, we find that *Mate Competition* exerts a strong, positive effect on support for hate crime.

Second, we test a final alternative explanation (using the YouGov survey). It is possible that at the heart of support for all violent behavior, including hate crime, is a predisposition for aggressive behavior, and, moreover, that conceptions of conflict and competition also have aggressiveness at their root. We consequently measure respondents' tendency to engage in physical aggressiveness relying on a widely-used scale developed by Buss and Perry (1992).<sup>32</sup> As expected, respondents who report higher degrees of aggressiveness are more likely to endorse hate crime, but the inclusion of this variable only slightly reduces the effect of perceived mate competition, which remains positive and statistically significant at  $p < .001$ . These results and variables can be found in Appendix D.7.

To sum up, our individual-level evidence lends strong support for the argument that

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<sup>32</sup> We include: (1) If I have to resort to violence to protect my rights, I will; (2) I have become so mad that I have broken things; (3) Given enough provocation, I may hit another person.

perceived refugee-native mate competition increases support for anti-refugee hate crime. Individuals – especially if they are male and fall in the most mating-active age range – are more likely to believe that refugees pose a mating threat if they live in areas where heterosexual mating markets are already unfavorable to men. This belief is in turn an important predictor of the endorsement of hate crime. Germans who fear that refugees make it more difficult for German men to find female partners are more likely to support the use of violence against this group.

## 5 Conclusion

This paper has turned the spotlight on an overlooked topic in the study of anti-migrant behavior: mate competition. Our attention to the structural conditions that give rise to concerns over mate competition expands theories of hate crime – and anti-migrant behavior more generally – that have typically focused on the conditions triggering economic or cultural threats (e.g., Adida, Laitin and Valfort, 2016; Choi, Poertner and Sambanis, 2019; Maxwell and House, 2018). Competition over mates is not an inherently cultural or economic phenomenon. Nor is the search for partners fleeting: it represents an enduring aspect of the human condition. As such, we argue, and our evidence underscores, that mating and marriage markets should be firmly incorporated into theories of immigrant conflict.

We also innovate empirically, undertaking the most comprehensive development of survey items capturing support for hate crime to date: we propose several variables; test reliability via list experiments; and field items at different times using different samples and survey firms. While previous researchers may have shied away from asking respondents about their

endorsement of hate crime, our work demonstrates that support for such violent actions can in fact be reliably measured.

Using these measures, we advance existing work by complementing our ecological findings with corroborating individual-level evidence. We demonstrate that perceived refugee-native mate competition is significantly higher among men who live in municipalities characterized by a mating squeeze, show that this perception is linked to support for hate crimes, and that this relationship remains even while controlling for leading alternative explanations related to economic competition, xenophobia, frustration, and aggressiveness.

Future research can build on our findings. First, while our study varies sex ratios and perceived mate competition, it occurs in a setting where the majority of refugees are men originating from the Middle East and Africa. Though this aspect generalizes well to current inflows in Europe and North America, it means that we cannot easily test whether our results are conditional on ethno-national difference or gender. Replicating our study in developing countries, where refugees often share ethnic backgrounds with host populations (and nevertheless face backlash (Adida, 2014; Zhou, 2019)), would extend our study empirically and theoretically. Likewise, studies have long documented conflict among women when men are in short supply (cf., Campbell, 2013). Testing whether native women will target migrant women, especially when arrivals are disproportionately female, thus deserves further study.

Second, our findings offer insights for refugee allocation and protection. Germany has largely allocated refugees in proportion to locations' population size.<sup>33</sup> This scheme might signal equity from the perspective of the native citizenry, and, in doing so, may reduce

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<sup>33</sup> However, within-state allocation procedures can differ (Marbach and Ropers, 2018).

anti-immigrant opposition in the aggregate. But it does not take into account the threats that refugees face in localities with a surplus of men. Allocation schemes that prioritize proportionality may end up presenting acute dangers to refugees. As work on immigrant integration continues to expand, we highlight that researchers should be cognizant of the ways in which local gender imbalances can potentially harm integration.

Finally, we conclude that refugees who are sent to municipalities with excess males should receive better protection. Despite Germany being one of the most welcoming countries towards refugees across Europe, Amnesty International in 2016 stated that “long-standing and well-documented shortcomings in the response of law enforcement agencies to racist violence must be addressed.”<sup>34</sup> Risk assessment strategies should be in place that identify areas deemed more prone to violence. Our evidence makes clear that local sex ratios must be part of such assessments.

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<sup>34</sup> <https://www.amnesty.org/en/latest/news/2016/06>.

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## **Online Appendix**

Hate Crimes and Gender Imbalances:  
Fears over Mate Competition and Violence against Refugees

## Table of Contents

---

<b>A</b>	<b>Background Information</b>	<b>1</b>
A.1	Internal Migration and Gender Imbalances in Germany . . . . .	1
A.2	Public Attention to Refugee-Native Dating and Relationships . . . . .	3
<b>B</b>	<b>Hate Crime Data</b>	<b>8</b>
B.1	Description . . . . .	8
B.2	General Differences in Statistics and Potential Reporting Biases . . . . .	8
<b>C</b>	<b>Contextual Analysis: Incidence of Hate Crime</b>	<b>10</b>
C.1	Different Model Specification . . . . .	10
C.2	Different Age Range of “Excess Males” (Age 25 - 44) . . . . .	11
C.3	Linear Probability Model . . . . .	12
C.4	Different Definition of Dependent Variable: Physical Attacks . . . . .	13
C.5	Negative-Binomial Regression . . . . .	14
C.6	Interaction with East and West . . . . .	15
C.7	Interaction between Excess Males and Refugee Inflow . . . . .	16
C.8	The Effect of Male Disadvantage . . . . .	17
C.9	Placebo Analysis . . . . .	18
C.10	Descriptive Statistics . . . . .	19
C.11	Definitions of Variables . . . . .	19
<b>D</b>	<b>Survey Analysis</b>	<b>20</b>
D.1	Survey Administration . . . . .	20
D.2	Respondents with strong anti-refugee sentiments . . . . .	21
D.3	Variables Predicting Mate Competition vs. Other Views About Refugees . . . . .	22
D.4	List Experiment from Wave 1 . . . . .	23
D.5	Different Dependent Variables . . . . .	24
D.6	Definition of Variables . . . . .	26
D.7	Robustness Check with YouGov Survey Data . . . . .	27

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## A Background Information

### A.1 Internal Migration and Gender Imbalances in Germany

Several trends have come together to lead to regional gender imbalances in Germany and in other developed economies. In many “post-industrial” economies shifts towards service-based employment and away from industrial production have been especially pronounced in urban centers. Moreover, the skills-gap between cities and more peripheral regions has also increased. These dynamics coincide with a rise in the educational attainment of women overall and, in some cases, with particularly pronounced gender-based differences in educational aspirations in rural areas. Moreover, men are more likely to seek employment in manufacturing, whereas women are often pursuing work in the tertiary sector. The educational and employment opportunities found in urban areas are therefore major pull factors for women in particular (Eckhard and Stauder, 2018; ESPON & Leibniz Institute for Regional Geography, 2012).

These dynamics also help explain internal east-west migration within Germany. After reunification in 1989, migration rates from eastern to western states were very high and dominated by young age cohorts. It is only in 2017 that migration from west to east surpasses east-to-west migration for the first time since reunification (Bangel et al., 2019). Females, particularly those with higher levels of education, were more likely to migrate westwards; between 1999 and 2005, two thirds of migrants from east to west were female (Geis and Orth, 2017). Reasons were both structural and socialization-related. In terms of structural pull factors, western states were characterized by a larger service sector associated with more opportunities for female employment and career prospects. In terms of socialization, a “strong [female] employment orientation” (Mau, 2019, p. 194) and a more egalitarian view of gender relations overall in the former GDR (exemplified by high female labor force participation rates, women routinely returning to work after childbirth as well as high average female education levels) resulted in relatively good prospects for economic integration in the west (Mau, 2019; Kröhnert and Klingholz, 2007). Consistent with this line of argument, males have also been more likely to return to the east compared to females. While female-dominated migration has slowed down substantially, and the gendered migration pattern between east and west saw a small net shift towards males in 2008, areas with excess males persist and are concentrated in – yet not limited to – eastern states (Geis and Orth, 2017).

Where skewed sex ratios have been a long-term trend, the shortage of women has become a salient local issue and has been picked up by print and TV media, think tanks, and regional governments struggling with low fertility rates and shrinking populations. Table A1 lists some examples. These sources connect local concentrations of excess males to dating and marriage markets, frequently portraying the difficulties that men face in finding a partner and starting a family.

<b>Title</b>	<b>Source</b>	<b>Date</b>
Allein in Norden	NDR (TV documentary)	19-Sep-11
Sag mir, wo die Frauen sind: Single-Männer in Ostdeutschland	ZDF (TV Documentary)	7-Oct-19
Not am Mann: Von Helden der Arbeit zur neuen Unterschicht	Berlin-Institut für Bevölkerung und Entwicklung	05-2007
Wer kommt? Wer geht? Wer bleibt? Eine Studie zur Verbesserung der Verbleibchancen qualifizierter Frauen im Landkreis Görlitz	Landratsamt Görlitz	12-2016
Regensburg ist neue Single-Hochburg	Mittelbayerische	12-Jan-10
Frauenmangel erschwert Partnersuche auf dem Land	Agrar Heute	1-Jan-19
Im Landkreis werden die Frauen knapp Mädels, wo seid ihr? Niederbayern hat statistisch den größten Männerüberschuss in Westdeutschland. Das macht die Partnersuche gerade für Jungbauern noch schwieriger	Ostsee Zeitung	20-Aug-05
Mitten in Bayern; Chinesische Verhältnisse	Süddeutsche Zeitung	24-Aug-19
Männer haben es schwerer bei der Partnersuche	Süddeutsche Zeitung	9-Mar-18
Partnerschaft; Unter Männern	Mitteldeutsche Zeitung	15-Dec-17
	Zeit Online	8-Mar-17

Table A1: Examples of Sources Discussing Shrinking Female Populations and Men’s Dating Prospects (Germany)

## A.2 Public Attention to Refugee-Native Dating and Relationships

In this section we provide information on the sources that have covered the topic of refugee-native relationships. Given that the refugee population in 2015-16 consisted primarily of men (see Figure C.10 below), this coverage was mainly about refugee men dating German women and teenage girls.

Table A2 lists 65 references (primarily newspaper articles, but also TV and radio shows) that have been published by mainstream sources in Germany and internationally. As the table shows, so-called flirt classes were covered widely, even beyond Germany. Other examples include human interest stories about relationships between German women/girls and refugee men (e.g., “My daughter is in love with a refugee: this is how inter-cultural love works”, “Kristin from Trier takes in refugees in her shared flat – and falls in love”) and controversies about German teenage girls dating Syrian men. A recent study (Salomo, 2019) linking the relationship between excess males and xenophobia to unbalanced dating and marriage markets also gained considerable attention.

Table A3 lists 59 references that have appeared on far-right websites (in particular *Politikversagen*, “Failure of Politics”; <http://www.politikversagen.net>), that generally adopt a harsh, anti-immigrant tone. Publications fall into two categories: original content produced by far-right sources and content that first appeared on mainstream sources, but that is re-posted by far-right sites and often given a negative spin. In the case of flirt classes, the organizers of these classes conducted their own media analysis and concluded that whereas the reception in the mainstream media was mainly positive, it was hostile on right-wing sites: “The fascist fake news platform Breitbart as well as thousands of AfD sympathizers have massively criticized our free course. The criticism had the pitiful tenor, “now they [refugees] not only steal our jobs – but also our women” (Flirt University, 2017).

Far-right sources are also more likely than mainstream media to discuss the surplus of males (*Männerüberschuss*) among refugees and the subsequent shortage of women (*Frauenmangel*). For example, “*Männerüberschuss*” (excess males) is its own own category on the site *Politikversagen*, featuring 241 articles as of June 3, 2020. Further, demographic imbalances are directly linked to incoming refugees and the topic of mate competition. In addition to lamenting the perceived competition, violence is considered to inevitably arise both from sexual frustration and associated aggressiveness both among refugees and native males.

Finally, AfD politicians have also publicly made the connection between the predominantly male composition of the refugee populations and its potential impact on refugee-native relationships. Two AfD politicians elected to Hamburg’s parliament posed an official inquiry to the city-state’s government asking about the male surplus among the refugee population and highlighting that the majority of male migrants belong to the age group (18-34 year-olds) that is “particularly relevant when it comes to looking for a romantic partner and starting a family” (Bürgerschaft der Freien Hansestadt Hamburg, 2019). In the state of Rheinland-Pfalz, the AfD parliamentary group sent an official inquiry to the state government entitled “Relationships between teenage girls and male asylum seekers” (Landtag Rheinland-Pfalz, 2019). The inquiry included several questions pertaining to the frequency of and nature of these relationships.

<b>Title</b>	<b>Source</b>	<b>Date</b>
Let's talk about sex	Stern	28-Jan-16
Kölner Flirt-Coach schult Essener Flüchtlinge	Westdeutsche Allgemeine Zeitung	26-Aug-16
Flirt-Experte bietet Beziehungs-Workshop für Flüchtlinge an	Welt	29-Aug-16
Flirt-Experte bietet Beziehungs-Workshop für Flüchtlinge an	Neue Rhein/Neue Ruhr Zeitung	29-Aug-16
Flirt-Experte bietet Beziehungs-Workshop für Flüchtlinge an	Westfalen Post	29-Aug-16
Flirt-Experte bietet Beziehungs-Workshop für Flüchtlinge an	Die Glocke	29-Aug-16
Integration in Sachen Liebe	Deutsche Welle	7-Sep-16
Erster Flirtkurs fuer Fluechtlinge	Bild	8-Sep-16
Erster Flirtkurs fuer Fluechtlinge	Bild Ruhrgebiet	8-Sep-16
So verliebt man sich in Deutschland	Bild Plus	8-Sep-16
Flirt-Coach schult Flüchtlinge	N24 Transkripte (TV)	9-Sep-16
Anfeindungen; Ein Flirtkurs für Flüchtlinge - von Security bewacht	Welt online	11-Sep-16
Migrants will get lessons in flirting to help them settle in Germany	Metro (UK)	13-Sep-16
L'Allemagne donne des leçons de séduction aux réfugiés	Le Monde Magazine (France)	24-Sep-16
“Was kommt bei Mädchen gut an?”	Salzburger Nachrichten	14-Oct-16
Workshop in Dortmund; Flirt-Experte erklärt Flüchtlingen die deutschen Frauen	Focus Online	28-Nov-16
Top dating tips for migrants from Germany's 'Mr Flirt'	The Canadian Press	28-Nov-16
Germany's 'Mr Flirt' teaches refugees how to pick up women	Associated Press	28-Nov-16
Top dating tips for migrants from Germany's 'Mr Flirt'	Associated Press International	28-Nov-16
Migrants are taught how to attract women and sexually arouse them in		
German seminars run by 'Mr Flirt' following spate of sex assaults across the country	Daily Mail	28-Nov-16
Germany's 'Mr Flirt' teaches refugees how to pick up women	Toronto Sun	28-Nov-16
'Mr. Flirt' teaches new migrants how to approach women in Germany	Euro News	28-Nov-16
Germany's 'Mr Flirt' teaches refugees how to pick up women	Darpan Magazine (Canada)	28-Nov-16
Refugees get top dating tips from Germany's 'Mr Flirt'	India TV	29-Nov-16
Germany's 'Mr Flirt' teaches refugees how to pick up women	Charleston Gazette-Mail (US)	29-Nov-16
Syrian refugees taught pickup lines by Germany's 'Mr Flirt'	Pretoria News (South Africa)	29-Nov-16
Germany's 'Mr. Flirt' teaches refugees how to approach women	Toronto Star	29-Nov-16
Mr. Flirt leert asielzoekers versieren	De Telegraaf (Holland)	29-Nov-16
Refugees learn art of flirting	The Bismarck Tribune (North Dakota)	29-Nov-16
Syrian migrants attend classes on how to PICK UP WOMEN by Germany's 'MR FLIRT'	Daily Express (UK)	29-Nov-16
Another minefield for those fleeing war: how to hit on a fraulein	The Australian	30-Nov-16
Pick-up lines lost in translation? Refugees flirt with fräuleins	i-Independent Print Ltd	1-Dec-16
Refugees learn art of the pickup; Mr. Flirt offers asylum seekers		
free classes on 'How to fall in love in Germany'	Times Colonist (Victoria, British Columbia)	2-Dec-16
Refugees find refuge learning to flirt	Daily Press (Newport News, VA)	5-Dec-16
Experten fordern mehr Frauen-Verstehkurse für Flüchtlinge	Focus Online	9-Dec-16

Continued on next page

**Table A2 – continued from previous page**

<b>Title</b>	<b>Source</b>	<b>Date</b>
Aufgeklärt	Der Spiegel	10-Dec-16
Flirt-Coach schult Flüchtlinge unter Polizeischutz	Kronen Zeitung (Austria)	12-Dec-16
Kurse für männliche Asylbewerber: Neue Initiativen zur Integration	The European	14-Dec-16
Eine Menge schiefgelaufen	Der Spiegel	23-Dec-16
Professor of flirting defies death threats	The Times (London)	6-Jan-17
Navigating A New Culture, A Syrian Refugee In Germany Seeks A Dating Coach’s Advice	NPR	26-Sep-17
Zur Integration gehört auch der Sex	Sonntagszeitung	18-Feb-18
Dieser Kölner gibt Flirtkurse für Flüchtlinge	Rheinische Post	20-Jul-17
Flirten für Flüchtlinge	Frankfurter Allgemeine	13-Jul-17
Top dating tips for migrants from Germany’s ‘Mr Flirt’	Fox News (US)	28-Nov-16
Was an Vorurteilen über Flüchtlinge dran ist	Sächsische Zeitung	21-Nov-14
German Dating 101	Aljazeera	2-Dec-16
Völkerverständigung in Sachen Liebe: Ein Flirtkurs für Flüchtlinge	Youtube - Der Spiegel	4-Feb-17
Dating-Kurs für Flüchtlinge in Dortmund	Youtube - Deutsche Welle	29-Nov-17
Flirtcoach für Flüchtlinge:“Ab wann hat man in Deutschland das erste Mal Sex“	Youtube - RT Deutsch	25-Sep-16
Mit dem Herzen ankommen	Süddeutsche Zeitung	16-Feb-16
Wenn ein Flüchtling eine Deutsche liebt	Süddeutsche Zeitung	17-Feb-16
Die unwahrscheinliche Liebesgeschichte von Toni und Ahmad	Der Tagesspiegel	11-Feb-17
Drei Geflüchtete kämpfen um ihre Liebe zu einer Deutschen	Chilli - Freiburger Stadtmagazin	15-Mar-17
Das deutsche Mädchen, der Flüchtling und die Liebe	Medienmagazin	1-Jan-18
Sabine, 52, heiratet Mahmoud, 25. Sie stammt aus Leer in Ostfriesland, er aus Damaskus in Syrien. Kann das Liebe sein?	Zeit Online	26-Oct-17
Lisa liebt Tunesier: Jetzt muss er Deutschland verlassen!	SAT.1 Frühstücksfernsehen	24-May-18
Deutsch-Syrisches Paar kämpft für die Liebe	SWR, Landesschau Baden-Württemberg	14-Mar-16
Deutsch-syrische Liebe	WDR for you	14-Oct-19
Eine grenzenlose Liebe zwischen Syrien und Deutschland	DW Deutsche Welle	17-Feb-19
Meine Tochter liebt einen Flüchtling: So geht interkulturelle Liebe	Sat1 Frühstücksfernsehen	10-May-15
Kristin aus Trier nimmt Flüchtlinge in ihrer WG auf - und verliebt sich	DASDING Trier	14-Sep-16
Doku im Kika: Deutsches Mädchen liebt syrischen Jungen	YouTube - BL Unterhaltung	10-Jan-18
Kika-Protagonist auf Facebook:“Das war als Scherz gemeint“	Welt	16-Jan-18
Liebe ohne Schweinefleisch	Frankfurter Allgemeine	15-Jan-18

Table A2: Articles and Videos about Refugee Men Dating or Marrying Native Women in Germany, Published in Mainstream Sources

<b>Title</b>	<b>Source</b>	<b>Date</b>
CDU-Familienwerbung mit weißer Frau und schwarzem Mann	Journalistenwatch	25-Jan-20
Erfolgreiches Speed-Dating für Migranten in Chemnitz	tag24.de*	30-Oct-19
Experten fordern mehr sexuelle Bildung für Flüchtlinge	welt.de*	27-Sep-19
Achtung Männerüberschuss	Youtube Neverforgetniki	7-Aug-19
Demonstration der Stärke	Young German	14-May-19
Zuwanderung, Männerüberschüsse, Partnermarkt und öffentliche Sicherheit	Philosophia Perennis	25-Dec-18
Versechsfacht! Jeder vierte junge Mann in Chemnitz ist Ausländer	bild.de*	27-Sep-18
Die Erpressung	Journalistenwatch	8-Aug-18
Warum finden einheimische Mädchen Asylanten so attraktiv?	Journalistenwatch	16-Jun-18
Forscherin zum Fall Susanna F.:“Das ist jetzt kein Einzelfall mehr”	welt.de*	10-Jun-18
Die neuen Nachbarn sind 20 junge Männer	rnz.de*	24-May-18
Ins Grauen	der-kleine-akif.de	30-Apr-18
Stellvertretende Bürgermeisterin heiratet Flüchtling	op-marburg.de*	3-Feb-18
Der Import der falschen Söhne	pi-news.net	7-Jan-18
Wie junge Migranten den Umgang mit Frauen lernen	Augsburger Allgemeine*	6-Dec-17
Unbewaffnete übernehmen Europa	Youtube STOPP Schlafschaf 2	30-Aug-17
Streit um ein Mädchen - 40 Jugendliche liefern sich Massenschlägerei	bild.de*	24-Aug-17
Für ihren Flüchtling ließ sie ihre behinderte Tochter sitzen	blick.ch*	2-Aug-17
Sugar Mamas	Youtube	1-Aug-17
Sugar Mamas und ihre Flüchtlinge	dasbiber.at*	23-Jul-17
Flirten für Flüchtlinge: “Küsst erst den Hals”	faz.net*	14-Jul-17
Kondomtraining für Flüchtlinge	hna.de*	11-May-17
Manchmal fehlen selbst den Dolmetschern die Worte	Stuttgarter-zeitung.de*	28-Apr-17
Revierkämpfe am Rhein	Youtube SAT1*	4-Apr-17
Flirtkurse für junge muslimische Männer - ein Gegenvorschlag	achgut.com	31-Mar-17
“Wir wollen eine Freundin”	derwesten.de*	27-Mar-17
Wieder Flirtkurs für Flüchtlinge	Youtube Spiegel TV*	19-Feb-17
Migranten in Schweden desillusioniert und frustriert: “Ihr habt unser Leben ruiniert”	epochtimes.de	4-Jan-17
Deutsche Freundin gesucht	Youtube euronews*	1-Dec-16
Omar will eine deutsche Freundin	freizeiten.net	30-Nov-16
Die meisten suchen nach Frauen	youtube krosta.tv	14-Oct-16
Streit um Frauen endet blutig	berliner-zeitung.de*	29-Sep-16
Flüchtling sucht Frau	tageszeitung.it*	27-Jun-16
Demographische Verdrängung. Raum ohne Volk	Junge Freiheit	19-Jun-16
Degenerieren bis der Irrenarzt kommt	der-kleine-akif.de	11-Jun-16
Fucking Deutsch	der-kleine-akif.de	12-Sep-16
Arbeiterwohlfahrt organisiert Flirt-Kurs für Flüchtlinge	wdr*	9-Sep-16

Continued on next page

**Table A3 – continued from previous page**

<b>Title</b>	<b>Source</b>	<b>Date</b>
Flirt-Coach schult Essener Flüchtlinge	derwesten.de*	30-Aug-16
Asylbewerber kommen wegen blonder Frauen nach Deutschland	freizeiten.net	11-Aug-16
Der Flüchtlingshelfer, der Pfarrer und das Testosteron	achgut.com	29-Jun-16
Flirtkurse für Flüchtlinge	Youtube BR*	6-May-16
Massenmigration bringt gefährlichen Männerüberschuss mit sich	contra-magazin.com	6-May-16
Was Flüchtling über deutsche Frauen lernen müssen	sueddeutsche.de*	10-Apr-16
Der postheroische Mann	nzz.ch*	3-Feb-16
Eure Frauen werden unsere Huren, eure Kinder unsere Sklaven	unzensuriert.at	1-Feb-16
Gunnar Heinsohn über den muslimischen Männerüberschuss	welt.de*	22-Jan-16
Merkels importierte Männer	rolandtichy.de	21-Jan-16
Sex-Dschihad	blauenarzissen.de	10-Jan-16
Ich möchte eine Frau, Kinder und Arbeit	youtube der spiegel*	1-Dec-15
Der Sex und die Flüchtlinge	achgut.com	17-Nov-15
Lehrerverband warnt junge Mädchen vor schnellem Sex mit Muslimen	stern.de*	8-Nov-15
ARD räumt falsches Flüchtlingsbild ein	focus.de*	20-Oct-15
Merkels demographischer Männerbauch	rolandtichy.de	25-Sep-15
Mit Jungmännern in den Untergang	ef-magazin.de	13-Sep-15
Falsche Bilder der “Völkerwanderung”	pi-news.net	8-Sep-15
Deutschland 2016: 20% Mehr Männer als Frauen zwischen 18 und 35	Wissensmanufaktur	19-Apr-16
Arbeiterwohlfahrt bringt Flüchtlingen Flirten bei	Junge Freiheit	8-Sep-16
Resource Frau	Neuland.mustermann	4-May-16
Männer ohne Frauen	Neuland.mustermann	3-Aug-15

Table A3: Articles and Videos about Refugee Men Dating or Marrying Native Women in Germany, Published and Curated by Far-Right Sources. *Note:* \* Denotes references originally published by mainstream sources. Publication dates refer to the date when references appeared on far-right sources.

## B Hate Crime Data

### B.1 Description

We are using hate crime data cataloging attacks against refugees and refugee housing since 2015 provided by “*Mut gegen rechte Gewalt*” (Courage against right-wing xenophobic violence – a joint chronicle by the Amadeu Antonio Foundation and PRO ASYL).

The data on attacks against refugees and refugee housing allows differentiation between: 1) arson attacks against refugee housing; 2) other attacks against refugee housing (e.g. vandalism); 3) personal injuries against refugees; and 4) rallies and demonstrations. Attacks against refugee housing refer to inhabited accommodation as well as housing that is planned to be allocated to or constructed for refugees (both shared and private housing). It also includes attacks against facilities that are explicitly committed to catering for refugees needs. Due to high numbers of cases, since 2016, *Mut gegen rechte Gewalt* only reports rallies and demonstrations that resulted in “litigable incidences.” Since it is not possible to isolate such cases in 2015, in order to ensure comparability across time, we do not include demonstrations in our analysis.

Several points are worth noting: First, double counting of an offense is possible if it falls into several categories (e.g. an attack against refugee housing that resulted in a physical injury of inhabitants). Second, physical attacks are only reported if the victim has been identified as refugee (not in a legal, but a de facto sense, i.e., including asylum seekers). Thus, attacks against refugees, especially within the categories considered here represent one segment of xenophobic attacks directed against immigrants and ethnic minorities. In addition, similar to other cases of violent attacks, a significant number of cases are expected to not be reported.

We manually compared the data collected by *Mut gegen rechte Gewalt* that we use in the paper to data that is published by federal and state parliaments in response to requests by political parties (parliaments in turn use data from the BKA (the federal office of criminal investigations)).<sup>1</sup> Our comparison generally confirms the comprehensiveness of the data we use. While we do find some discrepancies, they appear to be non-systematic.

### B.2 General Differences in Statistics and Potential Reporting Biases

Differences in individual statistics related to hate crimes are well established (Deutscher Bundestag, 2017; Frey, 2015; Münstermann, 2016, 2017) and are partly due to technicalities. For instance, in a response to a parliamentary inquiry about BKA statistics related to attacks against refugees and refugee housing, violent attacks against planned housing were not reported since per definition, no refugee was in “immediate physical danger” – the phrasing used in the original parliamentary inquiry (Deutscher Bundestag, 2015b, p.6, own translation).

When inquiring directly about differences in statistics between the BKA, civil society organizations (such as *Mut gegen rechte Gewalt*) and news reports (e.g. Münstermann, 2016), the parliament responses refer to the following:

1) Technicalities, i.e., different statistics referring to (slightly) different types of questions resulting in different inclusion criteria.

2) Registering different cases, i.e., referring to the notion that not all xenophobic incidents are reported to the police while some of them are reported to civil society organizations and vice versa.

3) Different access to information and in part to different reporting periods, i.e., criminal police records providing “standardized and systematic” (Deutscher Bundestag, 2015b) information

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<sup>1</sup>We did so for the convenience sample of North-Rhine-Westphalia (Germany’s most populous state) during the 3rd quarter of 2015.

that the public does not have access to and that is subject to change in the process of criminal investigation.

4) The mode of registering crimes: Some sources (including *Mut gegen rechte Gewalt*) count crimes and thus double count a given incident if different criminal acts were committed at the same time. BKA statistics, however, report incidents and assign only one crime type per incident (the most severe in terms of the “quality of the criminal act, and the threat of punishment” (Deutscher Bundestag, 2015*b*, p.3, own translation) (Deutscher Bundestag, 2015*c,b,a*).

Other sources additionally point out that, despite the standardization of procedures of registering crimes, the application of these regulations varies across space (e.g. von Gostomski, Küpper and Heitmeyer, 2007). It can be influenced, for instance, by media attention that is drawn to specific crimes (Koopmans and Olzak, 2004). This is especially true for the category of politically motivated crimes, which rests on subjective assessments about the dominant motive for a given crime. There are other relevant interactions between media coverage and police activity: the extent to which press releases are issued on reported crimes is not expected to be constant across time and space.<sup>2</sup>

Definitions of different crimes and statistics can change across time. In the time frame under investigation, for instance, a change in regulations for how politically motivated crime was registered and reported to our data source by the BKA is partly to blame for the increase in incidents between 2015 and 2016: within the scope of the BKA data released in response to the parliamentary requests used by our data source, prior to 2016, attacks against refugees themselves were only reported if the person was attacked on the very premises (i.e., an attack at the bus stop in front of a refugee shelter would not have been reported by the BKA). This reporting practice changed in 2016 (Deutscher Bundestag, 2017, 2015*c*).

One important question that this discussion brings up is whether these registration and reporting differences vary systematically with the variables that predict hate crime in the ecological, municipality-level analysis. The BKA features a “quality control” team that cooperates with state representatives to work towards uniform implementation of hate crime reporting, but regional discrepancies remain. These are partly the result of police behavior: for a given crime, it is individual police officers that initially decide whether or not a right-wing extremist motivation exists. If police officers are less likely to record such a motive if they themselves harbor far-right, anti-refugee sentiments, and if these police sentiments correlate with sentiments held in their local municipalities writ-large, systematic under-reporting at the municipality level will result. Note that under-reporting may also occur because victims of hate crime are less likely to report these incidents if they perceive the police to be prejudice against refugees.<sup>3</sup>

For our analyses, this implies that under-reporting will produce biases that make it more difficult for us to establish a correlation between *Excess Males* and anti-refugee hate crime if anti-refugee sentiments and *Excess Males* move in tandem. When we regress *Excess Males* on anti-refugee sentiment (consisting of 8 questions) we find a positive relationship, which holds in the West and the East, but is statistically significant in the West only. However, the magnitude is quite small, as measured by correlation coefficients ( $r = .07$  overall,  $r = .02$  in East,  $r = .06$  in West), leading us to conclude that this particular bias is likely not strong.

Following a similar rationale, we focused on variation in education levels (i.e., low education could lead to lower levels of reporting) and found that the predictive effect of *Excess Males* on hate crime is not moderated by the percent of the population with a university entrance exam.

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<sup>2</sup>In Berlin, for instance, police press releases were issued for 3/29 reported attacks against refugee housing in the first half of 2016, while the number is 16/39 for similar attacks in 2014 (Berliner Abgeordnetenhaus, 2016*b,a*).

<sup>3</sup>See <https://www.bpb.de/politik/extremismus/rechtsextremismus/158566/ungezaehlte-opfer> and <https://www.bpb.de/politik/extremismus/rechtsextremismus/264158/pmk-methoden-und-debatten>.

# C Contextual Analysis: Incidence of Hate Crime

## C.1 Different Model Specification

Type of Dependent variable:	Dependent variable (Binary): Hate Crime – Logistic Regression					
	Sum	Annual	Sum	Annual	Sum	Annual
Excess Males (Age 15 - 44)	2.127*** (0.491)	2.132*** (0.432)	1.598*** (0.491)	1.549*** (0.411)	1.406*** (0.463)	1.537*** (0.412)
Log (Population)	1.730*** (0.056)	1.519*** (0.041)	1.619*** (0.060)	1.392*** (0.044)	1.522*** (0.055)	1.372*** (0.042)
Log (Population Density)	0.098 (0.070)	0.087* (0.052)	0.052 (0.070)	0.039 (0.051)	0.017 (0.066)	-0.002 (0.049)
Log (Unemployment Rate)			1.087*** (0.180)	1.028*** (0.142)	0.634*** (0.156)	0.715*** (0.130)
% of population change (2011 vs 2015)			-0.617 (0.975)	-0.235 (0.608)	-0.299 (0.851)	0.020 (0.541)
Vote share for AfD (2013)			5.618* (3.116)	4.822** (2.406)	5.358 (3.384)	3.178 (2.718)
County-level variables:						
Log (Refugee Inflow) (2014 vs 2015)					0.857*** (0.324)	0.734*** (0.261)
Log (Refugee Size) (2014)					-0.210** (0.104)	-0.192** (0.084)
Log (General Violence per capita)					0.136 (0.189)	0.022 (0.151)
% Highly Educated					-0.022* (0.013)	-0.018* (0.011)
Change in Manufacturing Share (2011 vs 2015)					8.177** (4.062)	9.588*** (3.167)
Share of Manufacturing					0.057 (0.750)	-0.306 (0.606)
Male Disadvantage					0.920** (0.371)	0.846*** (0.319)
County Fixed Effects	✓	✓	✓	✓		
State Fixed Effects					✓	✓
Year Fixed Effects		✓		✓		✓
Observations	10,307	30,921	10,029	30,087	9,282	27,846

*Note:* \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table C1: The Effect of Excess Males on the Probability of Observing at least One Hate Crime. *Note:* We present two different outcome types: Sum (equals one if a municipality witnessed at least one hate crime over the three-year period, and zero otherwise) and Annual (for each year of the three-year period, equals one if a municipality witnessed at least one hate crime and zero otherwise) across three different model specifications. Logistic regression with standard errors clustered at the county level. (The inclusion of *Change in Unemployment Rates*, which is not consistently significant, does not alter the main results.)

For completeness, we report the model specification for the regression in the sixth column. The other regressions in Section C include a subset of variables as indicated in each table. See definitions of the variables in Section C.11. Hate Crime  $\sim$  Excess Males + Log (Population) + Log (Population Density) + Log (Unemployment Rate) + % of population change + Vote share for AfD + Log (Refugee Inflow) + Log (Refugee Size) + Log (General Violence per capita) + % Highly Educated + Change in Manufacturing Share + Share of Manufacturing + Male Disadvantage + State-Fixed Effects + Year-Fixed Effects.

## C.2 Different Age Range of “Excess Males” (Age 25 - 44)

Type of Dependent variable:	Dependent variable (Binary): Hate Crime – Logistic Regressions					
	Sum	Annual	Sum	Annual	Sum	Annual
Excess Males (Age 25 - 44)	1.595*** (0.454)	1.794*** (0.400)	0.958** (0.456)	1.066*** (0.373)	0.932** (0.430)	1.192*** (0.364)
Log (Population)	1.726*** (0.056)	1.511*** (0.041)	1.614*** (0.059)	1.387*** (0.043)	1.518*** (0.054)	1.365*** (0.042)
Log (Population Density)	0.082 (0.070)	0.073 (0.052)	0.030 (0.070)	0.019 (0.051)	0.001 (0.066)	-0.014 (0.049)
Log (Unemployment Rate)			1.120*** (0.184)	1.039*** (0.145)	0.642*** (0.157)	0.704*** (0.131)
% of population change (2011 vs 2015)			-0.463 (0.905)	-0.023 (0.554)	-0.207 (0.816)	0.156 (0.511)
Vote share for AfD (2013)			5.974* (3.088)	5.282** (2.400)	5.776* (3.366)	3.771 (2.699)
<u>County-level variables:</u>						
Log (Refugee Inflow) (2014 vs 2015)					0.859*** (0.324)	0.705*** (0.263)
Log (Refugee Size) (2014)					-0.211** (0.103)	-0.191** (0.084)
Log (General Violence per capita)					0.130 (0.187)	0.019 (0.149)
% Highly Educated					-0.022* (0.013)	-0.018* (0.010)
Change in Manufacturing Share (2011 vs 2015)					8.213** (4.029)	9.464*** (3.139)
Share of Manufacturing					0.076 (0.748)	-0.318 (0.603)
Male Disadvantage					0.910** (0.369)	0.856*** (0.316)
County Fixed Effects	✓	✓	✓	✓		
State Fixed Effects					✓	✓
Year Fixed Effects		✓		✓		✓
Observations	10,378	31,134	10,097	30,291	9,288	27,864

*Note:* \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table C2: The Effect of Excess Males on the Probability of Observing at least One Hate Crime. *Note:* We present two different outcome types: Sum (equals one if a municipality witnessed at least one hate crime over the three-year period, and zero otherwise) and Annual (for each year of the three-year period, equals one if a municipality witnessed at least one hate crime and zero otherwise) across three different model specifications. Logistic regression with standard errors clustered at the county level.

### C.3 Linear Probability Model

Type of Dependent variable:	Dependent variable (Binary): Hate Crime – Linear Probability Model					
	Sum	Annual	Sum	Annual	Sum	Annual
Excess Males (Age 15 - 44) (2015)	0.116*** (0.027)	0.069*** (0.015)	0.089*** (0.025)	0.051*** (0.013)	0.095*** (0.026)	0.057*** (0.014)
Log (Population) (2015)	0.162*** (0.009)	0.086*** (0.005)	0.156*** (0.008)	0.081*** (0.004)	0.152*** (0.008)	0.078*** (0.004)
Log (Population Density) (2015)	0.011 (0.007)	0.011*** (0.004)	0.010 (0.007)	0.011*** (0.003)	0.008 (0.007)	0.008** (0.003)
Log (Unemployment Rate) (2015)			0.137*** (0.015)	0.090*** (0.009)	0.093*** (0.014)	0.066*** (0.008)
% of population change (2011 vs 2015)			-0.059 (0.086)	-0.031 (0.041)	0.024 (0.100)	0.025 (0.050)
Vote share for AfD (2013)			0.307** (0.147)	0.120* (0.069)	0.370** (0.182)	0.106 (0.089)
<u>County-level variables:</u>						
Log (Refugee Inflow) (2014 vs 2015)					0.075 (0.051)	0.046 (0.029)
Log (Refugee Size) (2014)					-0.019 (0.014)	-0.011 (0.007)
Log (General Violence per capita) (2015)					0.010 (0.021)	0.007 (0.011)
% Highly Educated (2011)					-0.003* (0.002)	-0.002** (0.001)
Change in Manufacturing Share (2011 vs 2015)					0.725 (0.489)	0.583** (0.243)
Share of Manufacturing (2015)					0.021 (0.092)	-0.023 (0.048)
Male Disadvantage (2015)					0.114** (0.047)	0.063** (0.025)
County Fixed Effects	✓	✓	✓	✓		
State Fixed Effects					✓	✓
Year Fixed Effects		✓		✓		✓
Observations	10,307	30,921	10,029	30,087	9,282	27,846

Note:

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table C3: The Effect of Excess Males on the Probability of Observing at least One Hate Crime. *Note:* We present two different outcome types: Sum (equals one if a municipality witnessed at least one hate crime over the three-year period, and zero otherwise) and Annual (for each year of the three-year period, equals one if a municipality witnessed at least one hate crime and zero otherwise) across three different model specifications. Linear probability model with standard errors clustered at the county level.

## C.4 Different Definition of Dependent Variable: Physical Attacks

Type of Dependent variable:	Dependent variable (Binary): Physical Attack – Logistic Regressions					
	Sum	Annual	Sum	Annual	Sum	Annual
Excess Males (Age 15 - 44) (2015)	3.773*** (0.938)	3.038*** (0.818)	2.624*** (0.910)	1.906** (0.744)	2.719*** (0.944)	1.634* (0.902)
Log (Population) (2015)	1.775*** (0.120)	1.640*** (0.090)	1.562*** (0.124)	1.429*** (0.100)	1.442*** (0.106)	1.366*** (0.101)
Log (Population Density) (2015)	0.096 (0.134)	0.071 (0.109)	0.080 (0.129)	0.045 (0.103)	0.046 (0.113)	-0.018 (0.105)
Log (Unemployment Rate) (2015)			1.591*** (0.346)	1.515*** (0.304)	1.179*** (0.282)	1.309*** (0.256)
% of population change (2011 vs 2015)			-0.837 (0.772)	-0.368 (0.721)	0.023 (0.580)	0.154 (0.555)
Vote share for AfD (2013)			2.058 (6.640)	0.875 (6.184)	0.588 (5.209)	0.763 (5.080)
<u>County-level variables:</u>						
Log (Refugee Inflow) (2014 vs 2015)					0.262 (0.686)	-0.091 (0.646)
Log (Refugee Size) (2014)					-0.429** (0.210)	-0.288 (0.202)
Log (General Violence per capita) (2015)					-0.303 (0.383)	-0.288 (0.383)
% Highly Educated (2011)					-0.011 (0.024)	-0.018 (0.023)
Change in Manufacturing Share (2011 vs 2015)					4.548 (8.376)	-0.633 (8.393)
Share of Manufacturing (2015)					1.859 (1.742)	2.050 (1.632)
Male Disadvantage (2015)					1.258 (0.800)	1.217 (0.786)
County Fixed Effects	✓	✓	✓	✓		
State Fixed Effects					✓	✓
Year Fixed Effects		✓		✓		✓
Observations	10,307	30,921	10,029	30,087	9,282	27,846

Note:

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table C4: The Effect of Excess Males on the Probability of Observing at least One Physical Attack. *Note:* We present two different outcome types: Sum (equals one if a municipality witnessed at least one physical attack over the three-year period, and zero otherwise) and Annual (for each year of the three-year period, equals one if a municipality witnessed at least one physical attack and zero otherwise) across three different model specifications. Logistic regression with standard errors clustered at the county level.

## C.5 Negative-Binomial Regression

Type of Dependent variable:	Dependent variable (Count): Hate Crime	
	Sum	Annual
Excess Males (Age 15 - 44) (2015)	1.150*** (0.366)	1.246*** (0.363)
Log (Population) (2015)	1.264*** (0.039)	1.249*** (0.038)
Log (Population Density) (2015)	-0.032 (0.045)	-0.030 (0.045)
Log (Unemployment Rate) (2015)	0.703*** (0.131)	0.729*** (0.129)
% of population change (2011 vs 2015)	0.072 (0.508)	0.096 (0.457)
Vote share for AfD (2013)	4.464* (2.670)	4.088 (2.670)
County-level variables:		
Log (Refugee Inflow) (2014 vs 2015)	0.588** (0.280)	0.541* (0.272)
Log (Refugee Size) (2014)	-0.189** (0.093)	-0.180* (0.093)
Log (General Violence per capita) (2015)	0.034 (0.161)	-0.016 (0.165)
% of High Education (2011)	-0.017 (0.011)	-0.017* (0.011)
Change in Manufacturing Share (2011 vs 2015)	10.081*** (3.333)	10.432*** (3.452)
Share of Manufacturing (2015)	-0.028 (0.651)	-0.035 (0.632)
Male Disadvantage (2015)	0.617* (0.337)	0.656* (0.345)
State Fixed Effects	✓	✓
Year Fixed Effects		✓
Observations	9,282	27,846
$\theta$	1.247*** (0.088)	0.842*** (0.053)

*Note:* \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table C5: The Effect of Excess Males on the Number of Hate Crimes. *Note:* We present two different outcome types: Sum (the total number of hate crimes over the three-year period) and Annual (the number of hate crimes in each year of the three-year period) for Negative Binomial regression. Standard errors are clustered at the county level.

## C.6 Interaction with East and West

	Dependent variable: Hate Crime – Logistic Regression			
	Sum	Annual	Sum	Annual
Excess Males (Age 15 - 44)	1.291*** (0.462)	1.442*** (0.410)	1.588** (0.791)	1.445** (0.701)
West	0.075 (0.161)	-0.124 (0.118)	0.542 (1.063)	-0.119 (0.913)
Excess Males × West			-0.419 (0.938)	-0.004 (0.812)
Log (Population)	1.484*** (0.046)	1.340*** (0.039)	1.485*** (0.046)	1.340*** (0.039)
Log (Population Density)	0.046 (0.061)	0.030 (0.048)	0.046 (0.061)	0.030 (0.048)
Log (Unemployment Rate)	0.585*** (0.148)	0.653*** (0.124)	0.577*** (0.151)	0.653*** (0.128)
% of population change (2011 vs 2015)	0.050 (0.772)	0.308 (0.499)	0.072 (0.765)	0.308 (0.497)
Vote share for AfD (2013)	3.865 (3.223)	3.183 (2.624)	3.860 (3.223)	3.183 (2.625)
County-level variables:				
Log (Refugee Inflow) (2014 vs 2015)	1.475*** (0.326)	1.282*** (0.247)	1.471*** (0.328)	1.282*** (0.247)
Log (Refugee Size) (2014)	-0.397*** (0.094)	-0.386*** (0.079)	-0.396*** (0.094)	-0.386*** (0.079)
Log (General Violence per capita)	0.083 (0.166)	-0.092 (0.138)	0.086 (0.166)	-0.092 (0.139)
% of High Education	-0.027** (0.012)	-0.021** (0.010)	-0.027** (0.012)	-0.021** (0.010)
Change in Manufacturing Share (2011 vs 2015)	7.554* (4.241)	8.568** (3.509)	7.560* (4.247)	8.568** (3.509)
Share of Manufacturing	-0.332 (0.666)	-0.611 (0.504)	-0.337 (0.666)	-0.611 (0.505)
Male Disadvantage	1.077*** (0.369)	1.015*** (0.317)	1.084*** (0.370)	1.016*** (0.318)
Year Fixed Effects		✓		✓
Observations	9,282	27,846	9,282	27,846

Note:

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table C6: Interaction between Excess Males and East/West Germany. *Note:* We present two different outcome types: Sum and Annual. Logistic regression with standard errors clustered at the county level.

For completeness, we report the model specification for the regression in the fourth column. The other regressions include a subset of variables as indicated above. See definitions of the variables in Section C.11. Hate Crime  $\sim$  Excess Males + West + Excess Males  $\times$  West + Log (Population) + Log (Population Density) + Log (Unemployment Rate) + % of population change + Vote share for AfD + Log (Refugee Inflow) + Log (Refugee Size) + Log (General Violence per capita) + % Highly Educated + Change in Manufacturing Share + Share of Manufacturing + Male Disadvantage + Year-Fixed Effects.

## C.7 Interaction between Excess Males and Refugee Inflow

Dependent variable: Hate Crime – Logistic Regressions		
	Sum	Annual
Excess Males (Age 15 - 44) (2015)	-8.441 (18.923)	-17.754 (15.168)
Log (Refugee Inflow) (2014 vs 2015)	-0.544 (2.711)	-2.018 (2.185)
Excess Males × Log (Refugee Inflow)	1.290 (2.477)	2.524 (1.987)
Log (Population) (2015)	1.522*** (0.055)	1.372*** (0.042)
Log (Population Density) (2015)	0.019 (0.066)	0.001 (0.049)
Log (Unemployment Rate)	0.630*** (0.155)	0.708*** (0.130)
% of population change (2011 vs 2015)	-0.299 (0.856)	0.017 (0.548)
Vote share for AfD (2013) (2015)	5.358 (3.386)	3.192 (2.726)
Log (Refugee Size) (2014) (2015)	-0.209** (0.104)	-0.190** (0.085)
Log (General Violence per capita) (2015)	0.141 (0.190)	0.035 (0.152)
% Highly Educated (2011)	-0.022* (0.013)	-0.019* (0.011)
Change in Manufacturing Share (2011 vs 2015)	8.200** (4.077)	9.647*** (3.200)
Share of Manufacturing (2015)	0.044 (0.750)	-0.335 (0.606)
Male Disadvantage (2015)	0.929** (0.372)	0.865*** (0.321)
State Fixed Effects	✓	✓
Year Fixed Effects		✓
Observations	9,282	27,846

*Note:* \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table C7: Interaction between Excess Males and Refugee Inflow. *Note:* We present two different outcome types: Sum and Annual. Logistic regression with standard errors clustered at the county level. The interaction term between “Excess Male” and “Refugee Inflow” is positive but is not statistically significant at the 0.05 level.

For completeness, we report the model specification for the regression in the second column. The other regression includes a subset of variables as indicated above. See definitions of the variables in Section C.11. Hate Crime  $\sim$  Excess Males + Log (Refugee Inflow) + Excess Males  $\times$  Log(Refugee Inflow) + Log (Population) + Log (Population Density) + Log (Unemployment Rate) + % of population change + Vote share for AfD + Log (Refugee Size) + Log (General Violence per capita) + % Highly Educated + Change in Manufacturing Share + Share of Manufacturing + Male Disadvantage + Year-Fixed Effects + State-Fixed Effects.

## C.8 The Effect of Male Disadvantage

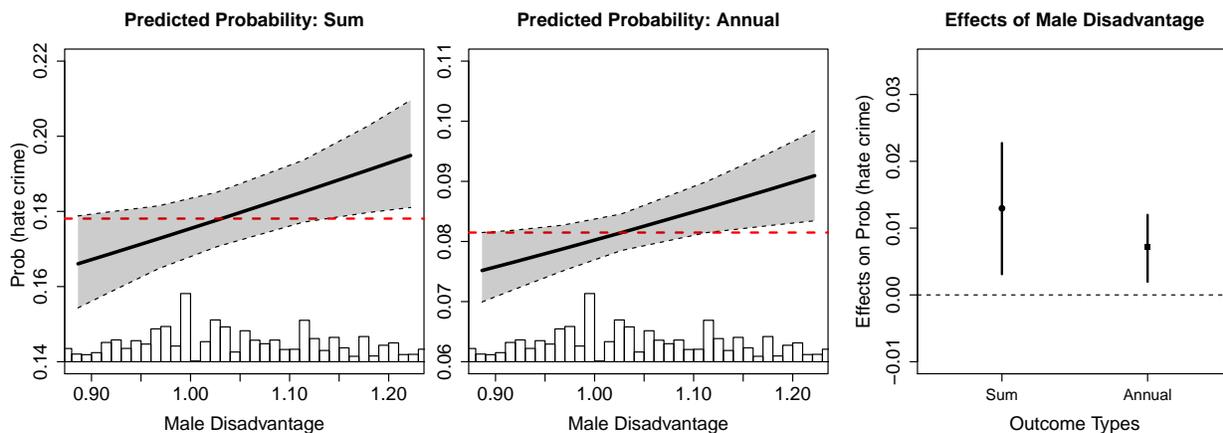


Figure C8: The Effect of Male Disadvantage on the Predicted Probability of Observing at least One Hate Crime. *Note:* Logistic regression with standard errors clustered at the county level (see the Appendix for the full results and all included controls). We present two different outcome types: Sum (equals one if a municipality witnessed at least one hate crime over the three-year period, and zero otherwise) and Annual (for each year of the three-year period, equals one if a municipality witnessed at least one hate crime and zero otherwise). In the left and center panels, the histograms present the distribution of *Male Disadvantage*, measured at the county level. We do not use the municipality level because nearly 6,000 municipalities had a population of less than 2,000; the correspondingly small population that is active in the labor force (especially when broken down by gender) makes this measure less informative at the municipality level. The red dotted lines indicate the means of each outcome type. The right-most panel depicts the effect of changing *Male Disadvantage* from 1 (no imbalance) to 1.15 ( $\approx$  80th percentile).

## C.9 Placebo Analysis

We rely on a placebo design to test whether we suffer from unmeasured confounding. Building on the negative control literature (Lipsitch, Tchetgen Tchetgen and Cohen, 2010; Egami, 2018), we employ a placebo treatment design. In this design, we assume that a placebo treatment and the main treatment share the same confounding structure, but the placebo treatment has no causal effect on the outcome of interest. Under this assumption, the conditional association between the placebo treatment and the outcome of interest provides evidence for unmeasured confounding. Intuitively, there is no causal relationship between the two variables, so any residual associations come from confounding. This design is most credible when we have panel data and the outcome variable does not affect future treatments (Miao and Tchetgen Tchetgen, 2017). In our substantive context, this means that the outcome of interest, the incidence of hate crimes, does not affect the main predictor, “Excess Males”, in the subsequent years. Note that our definition of “Excess Males” is the gender ratio in each municipality based on everyone counted in the German census. So, if many German citizens move to and from municipalities based on hate crimes, this assumption is violated. However, while the number of refugees in each municipality might be strongly affected by the incidence of hate crimes, “Excess Males” is unlikely to change significantly, and thus, this assumption is reasonable in our context. To make the assumption more plausible, we also conduct a placebo analysis by restricting to municipalities with population size larger than the median in Germany, where the change in “Excess Males” is even less likely. Under this assumption, we can detect unmeasured confounding by testing whether the future “Excess Males” is associated with the incidence of hate crimes after controlling for “Excess Males” in the current year and all other observed confounders.

Table C.9 shows the results. For 2015, 2016, and 2017, as well as the pooled analysis (pooling all the years), we find that the future treatments are not associated with the current outcome, meaning that this analysis produces no evidence of unmeasured confounding. Comparing the values of coefficients to our main regression coefficients in Table C1, we can see that these results are not driven by large uncertainties. The fifth column shows the same evidence when we restrict our samples to large municipalities where the required assumption is more plausible.

	Dependent variable (Binary): Hate Crime				
	2015	2016	2017	Pooled	Pooled (Large Municipalities)
Future-Treatment	-1.326 (1.551)	0.480 (1.061)	0.544 (1.592)	-0.277 (0.773)	-0.243 (1.043)
Controls at Municipality-level	✓	✓	✓	✓	✓
Controls at County-level	✓	✓	✓	✓	✓
State Fixed Effects	✓	✓	✓	✓	✓
Year Fixed Effects				✓	✓
Observations	8,939	8,681	8,679	26,299	13,147

*Note:*

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table C.9: Placebo Analysis. *Note:* Each model controls for “Excess Males” in the current year in addition to all other control variables we included in our main regression models in Table C1.

## C.10 Descriptive Statistics

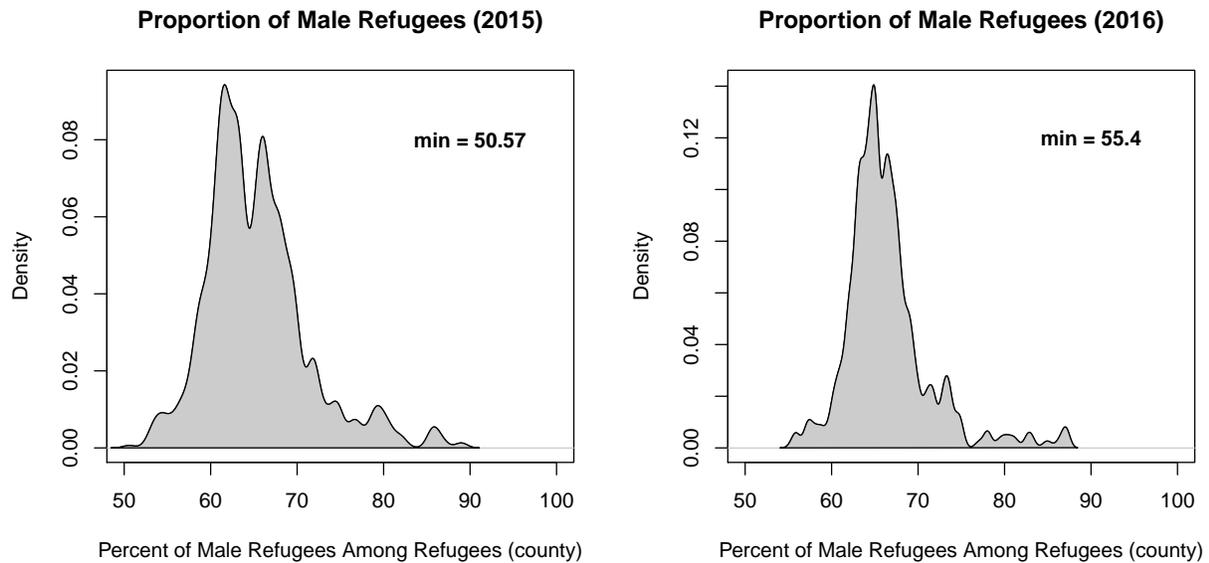


Figure C.10: Proportions of Male Refugees at the County level.

## C.11 Definitions of Variables

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### Municipality-level variables

Population	Population size in 2015
Population density	Population density in 2015
Unemployment rate	Unemployment rate in 2015
Population change	Percent population change between 2011 and 2015
Vote share for AfD	Vote share for AfD in 2013

### County-level variables

Refugee Inflow	Number of refugees in 2015 minus number of refugees in 2014
Refugee Size	Number of refugees in 2014
Violence per capita	Number of general violence incidents per capita in 2015
Highly Educated	Percent of the population with university entrance exam, including still in school in 2011
Change in Manufacturing Share	Percentage point change in proportion working in manufacturing between 2011 and 2015
Share of Manufacturing	Percent working in manufacturing in 2015
Male Disadvantage	Male unemployment rate divided by female unemployment rate in 2015

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Table C.11: Variables Included in Analyses Predicting the Incidence of Hate Crime.

## D Survey Analysis

### D.1 Survey Administration

The Respondi panel covers the online, 18+ German population. Our initial set of respondents (wave 1) was sampled from Respondi’s panel to be nationally representative on age, gender, and region. Respondi’s quality standards, along with further details on their sampling methodology, are reported below:

Membership and participation are voluntary and follow a double opt-in registration process. The panel is actively and centrally managed by a professional panel team. In order to ensure a high standard of quality, the panel undergoes a continuous quality control process using a thorough scoring and controlling system. Since we recruit via our own opinion platforms and the telephone, the focus is on intrinsic motivation thus preventing sample bias due to “professional” respondents. A guaranteed panel response rate of 60 % within the first seven days serves as proof of this high standard of quality (Respondi, “Quality Standards”).

Our panel survey design was archived in [withheld for anonymity]. The panel survey consisted of 4 waves, with the first wave consisting of 3,435 respondents. We added fresh samples in each wave, both to avoid panel conditioning and to maintain the per-wave sample size at close to 3,000. We also embedded a simple attention check every wave and analyze only observations that passed this check. Our 15-month panel lasted from September 2016 to December 2017, bracketing the German federal election in September 2017. In each wave, we retained about 70% of respondents from each previous wave. Around 44% of respondents participated in all four waves.

Wave	Date	Sample Size	Fresh Sample	Sample Size (Analyze)
Wave 1	09/05/2016 – 09/23/2016	3435	–	3419
Wave 2	01/04/2017 – 01/17/2017	2907	10.3 %	2883
Wave 3	06/19/2017 – 06/30/2017	3538	38.7 %	3274
Wave 4	12/07/2017 – 12/22/2017	3083	23.1 %	3019

Table D.1.1: Sampling Design

	Until Wave 1	Until Wave 2	Until Wave 3	Until Wave 4
From Wave 1	100	75.9	58.0	44.2
From Wave 2	–	100	74.6	56.3
From Wave 3	–	–	100	67.0
From Wave 4	–	–	–	100

Table D.1.2: Attrition Rate.

## D.2 Respondents with strong anti-refugee sentiments

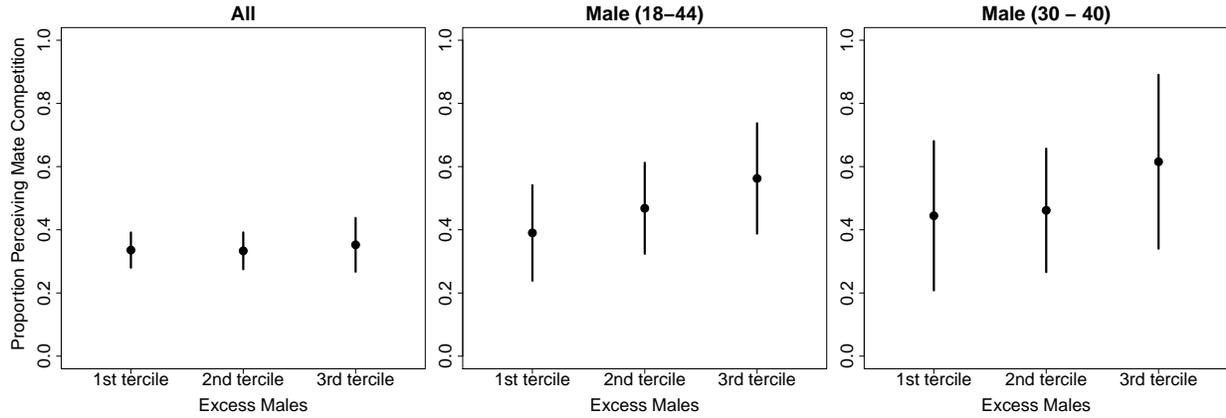


Figure D.2: Individuals Living in Municipalities with a Higher Degree of *Excess Males* Perceive More Mate Competition. *Note:* Among respondents with strong anti-refugee sentiments (top 25 percentile defined by an average of 8 questions related to refugees), we represent the proportion of respondents who agree that the inflow of refugees makes it more difficult for native men to find female partners (with 95% confidence intervals) across terciles of *Excess Males*. Among respondents with strong anti-refugee sentiments (top 25 percentile), the panels include all respondents, male respondents aged between 18 and 44, and male respondents aged between 30 and 40, respectively.

### D.3 Variables Predicting Mate Competition vs. Other Views About Refugees

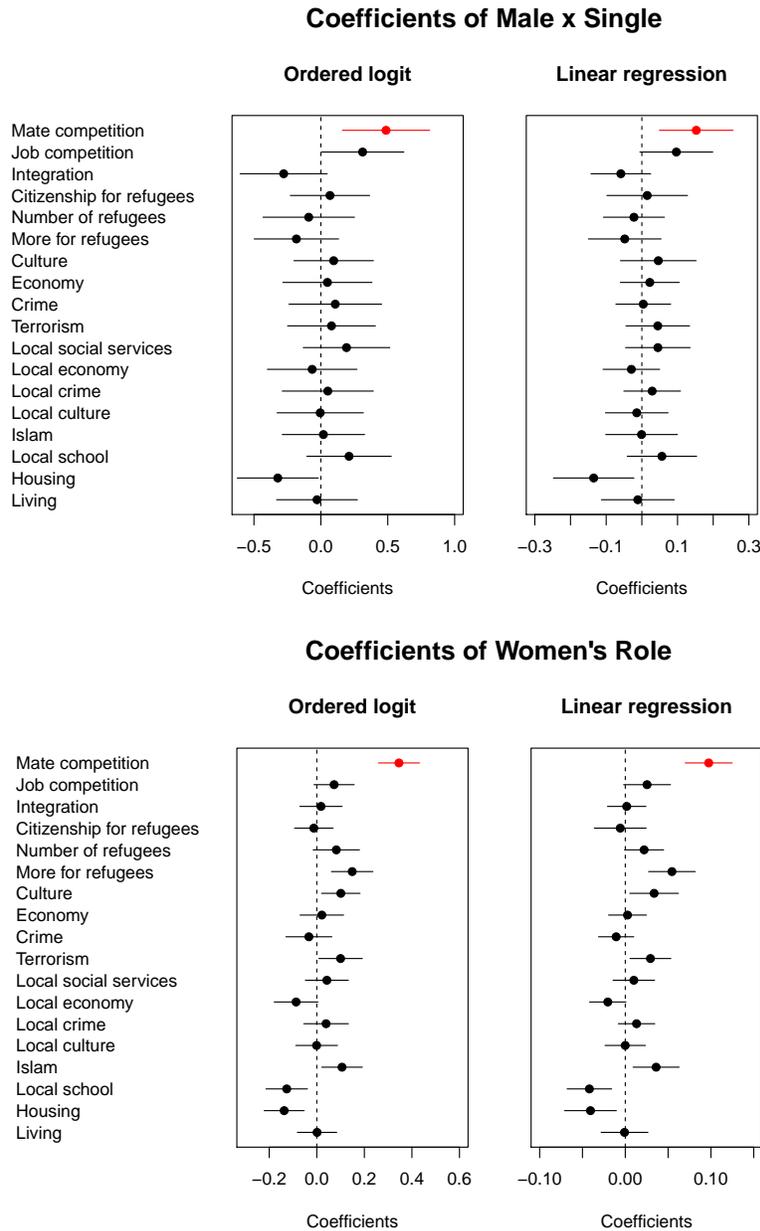


Figure D.3: This figure displays the effect of being male and single (top panel) and of *Women's Role* (bottom panel) on a given listed variable, controlling for all other listed variables. It shows that being a single man/agreeing that “women should take their role as wife and mother more seriously” (4-point scale) strongly predicts *Mate Competition*, controlling for the other 17 variables. (Note that the effect of being male and single on *Mate Competition* is significant and positive when we control for socio-demographic variables. Views about “Women’s Role” have an especially distinct effect among women (not shown)). See Table D.6 (national and local-level refugee variables; coded so that higher values indicate greater hostility) for variable definitions.

## D.4 List Experiment from Wave 1

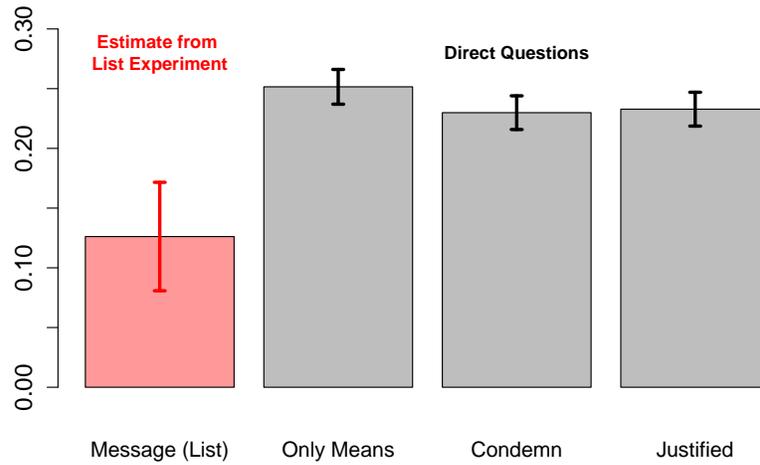


Figure D.4.1: Proportion of respondents who agree with each of the four statements in Wave 1: (1) Only Means: “When it comes to the refugee problem, violence is sometimes the only means that citizens have to get the attention of German politicians.” (2) Message: “Attacks against refugee homes are sometimes necessary to make it clear to politicians that we have a refugee problem,” (3) Condemn: “Politicians should condemn attacks against refugees more forcefully,” (4) Justified: “Hostility against refugees is sometimes justified, even when it ends up in violence.” Note: we only conducted a list experiment about the first question, Message. Because questions differed, we administered the direct question and the list experiment to the entire sample. Error bars indicate 95% confidence intervals.

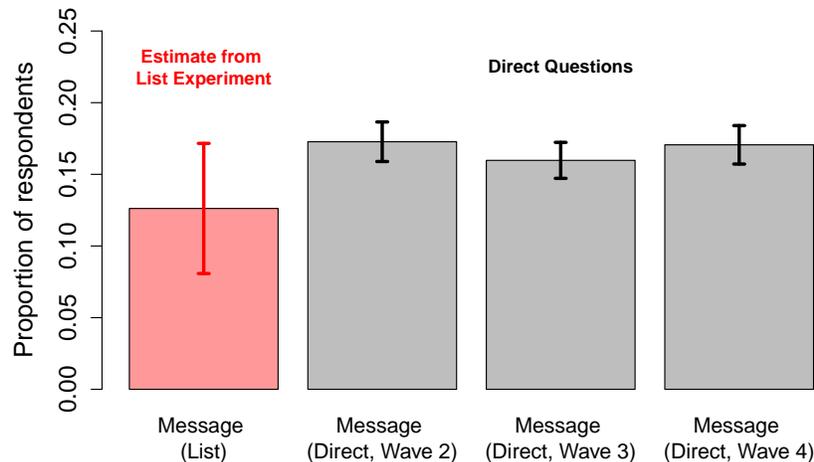


Figure D.4.2: Proportion of respondents in each wave who agree with the following statement: “Attacks against refugee homes are sometimes necessary to make it clear to politicians that we have a refugee problem.” Note: We conducted a list experiment containing the above statement (*Message*) in Wave 1, and we also directly asked the same question in the other three waves. Error bars indicate 95% confidence intervals.

## D.5 Different Dependent Variables

	Dependent variables (OLS)				
	Means	Justified	Message	Prevent	Condemn
Mate Competition	0.155*** (0.019)	0.173*** (0.019)	0.192*** (0.019)	0.204*** (0.018)	0.027 (0.021)
Job Competition	0.056*** (0.019)	0.050*** (0.019)	0.097*** (0.019)	0.087*** (0.018)	0.017 (0.021)
Life Satisfaction	-0.0001 (0.006)	-0.009 (0.006)	-0.004 (0.006)	-0.011* (0.006)	-0.007 (0.007)
Socio-Demographics	✓	✓	✓	✓	✓
Attitudes toward Refugees (National)	✓	✓	✓	✓	✓
Attitudes toward Refugees (Local)	✓	✓	✓	✓	✓
Additional Controls	✓	✓	✓	✓	✓
Observations	3,008	3,008	3,008	3,008	3,008
R <sup>2</sup>	0.459	0.453	0.448	0.469	0.347
Adjusted R <sup>2</sup>	0.431	0.424	0.419	0.441	0.313

Note:

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table D.5.1: Mate Competition Predicts Support for Hate Crime. Note: OLS with standard errors in parentheses. The dependent variables are *Only Means*, *Justified*, *Message*, *Prevent*, and *Condemn*. The main independent variable is *Mate Competition* (both range from (1) disagree strongly to (4) agree strongly; *Condemn* is reverse-coded). See below for definitions of all control variables.

For completeness, we report the model specification for the regressions. Each regression uses a different definition of outcomes as indicated above. See definitions of the variables in Section D.6. Support for Hate Crime  $\sim$  Mate Competition + Job Competition + Life Satisfaction + Age + Gender + Citizenship + Marital Status + Religion + Education + Main activity + Income + Socio-economic self-assessment + Household size + Integration + Citizenship for refugees + Number of refugees + More for refugees + Culture + Economy + Crime + Terrorism + Local social services + Local economy + Local crime + Local culture + Islam + Local school + Housing + Living + Left-Right Scale + Closeness to AfD + Attitudes toward AfD + Attitudes toward Muslims + Contact with Refugees + Distance to refugee reception centers + Settlement of refugees living in area + State-Fixed effects.

	Dependent variables (OLS)				
	Means	Justified	Message	Prevent	Condemn
Mate Competition	0.100*** (0.035)	0.151*** (0.036)	0.171*** (0.036)	0.143*** (0.034)	0.079** (0.039)
West	-0.071 (0.079)	-0.052 (0.081)	-0.034 (0.080)	-0.142* (0.076)	0.037 (0.088)
Mate Competition × West	0.072* (0.037)	0.032 (0.038)	0.029 (0.038)	0.079** (0.036)	-0.059 (0.041)
Job Competition	0.050*** (0.019)	0.045** (0.019)	0.092*** (0.019)	0.083*** (0.018)	0.015 (0.021)
Life Satisfaction	-0.0001 (0.006)	-0.010 (0.006)	-0.005 (0.006)	-0.011* (0.006)	-0.007 (0.007)
Socio-Demographics	✓	✓	✓	✓	✓
Attitudes toward Refugees (National)	✓	✓	✓	✓	✓
Attitudes toward Refugees (Local)	✓	✓	✓	✓	✓
Additional Controls	✓	✓	✓	✓	✓
Observations	3,008	3,008	3,008	3,008	3,008
R <sup>2</sup>	0.457	0.448	0.445	0.468	0.343
Adjusted R <sup>2</sup>	0.431	0.422	0.419	0.443	0.311

Note:

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table D.5.2: Mate Competition Predicts Support for Hate Crime (with East/West Interaction). Note: OLS with standard errors in parentheses. The dependent variables are *Only Means*, *Justified*, *Message*, *Prevent*, and *Condemn*. The main independent variable is *Mate Competition* (both range from (1) disagree strongly to (4) agree strongly; *Condemn* is reverse-coded).

## D.6 Definition of Variables

<b>Socio-Demographics</b>	
Age	Q1. Age group
Gender	Q2. Gender
State	Q3. State of Residence
Citizenship	Q7. Citizenship_Germany
Marital status	Q14. Marital status
Religion	Q17. Religious affiliation
Education	Years of education
Main activity	Q25. Main activity/occupation
Income	Q33. Income
Socio-economic self-assessment	Q51. Socio-economic self-assessment
Household size	Q79. The number of people in household
<b>National level Refugee Variables</b>	
	To what extent do you agree with the following statements?
Integration	Q73.1 Refugees are integrating well into Germany
Citizenship for refugees	Q73.2 Refugees who live in Germany permanently should be entitled to German citizenship
Number of refugees	Q73.3 The number of refugees should be reduced
More for refugees	Q73.4 More is being done for refugees than for native Germans
Culture	Q73.5 Refugees should be willing to give up much of their culture of origin and instead adopt German culture
Economy	Q73.6 Refugees are good for the German economy
Crime	Q73.7 Refugees increase crime
Terrorism	Q73.8 The inflow of refugees increases the risk of terrorism
<b>Local level Refugee Variables</b>	
	If additional refugees came to your town this would
Local social services	Q75.1 Present a burden on local social services
Local economy	Q75.2 Benefit the local economy
Local crime	Q75.3 Increase crime in my town
Local culture	Q75.4 Enrich the local culture
Islam	Q75.5 Increase the influence of Islam in my town
Local school	Q75.6 Be a big challenge for our local schools
Housing	Q75.7 Increases competition for housing in my town
Living	Q75.8 Would change the way in which we live in my town
<b>Additional Controls</b>	
Left-Right Scale	Q21. Left-Right Scale
Closeness to AfD	Q23. Closeness to AfD (from 0 to 100)
Attitudes toward AfD	Attitudes toward AfD: between 0 and 1 (average of 3 questions in Q24)
Attitudes toward Muslims	Attitudes toward Muslims: between 0 and 1 (average of 8 questions in Q15)
Contact with Refugees	Contact with refugees: between 0 and 1 (average of 6 questions in Q67 and Q68)
Distance to refugee reception centers	Q71. Self-assessed distance to refugee reception centers
Settlement of refugees living in area	Q72. Self-assessed size of refugees settled in town

Table D.6: Variables Included in Survey Analyses (Support for Hate Crime)

## D.7 Robustness Check with YouGov Survey Data

Dependent variable: <i>Violence is sometimes the only means</i>					
Mate Competition	0.413*** (0.026)	0.374*** (0.026)	0.266*** (0.028)	0.256*** (0.028)	0.248*** (0.028)
Aggressiveness		0.508*** (0.077)	0.428*** (0.074)	0.430*** (0.074)	0.404*** (0.074)
Socio-Demographics	✓	✓	✓	✓	✓
Refugee questions			✓	✓	✓
Contact with Refugees				✓	✓
Closeness to AfD					✓
Observations	1,527	1,527	1,527	1,527	1,527
R <sup>2</sup>	0.254	0.276	0.354	0.365	0.374
Adjusted R <sup>2</sup>	0.223	0.245	0.314	0.316	0.326

*Note:* \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table D.7.1: Mate Competition Predicts Support for Hate Crime. *Note:* OLS with standard errors in parentheses. The dependent variable is *Only Means*, and the main independent variable is *Mate Competition* (both range from (1) disagree strongly to (4) agree strongly). “Socio-Demographics” includes age, gender, marital status, religious affiliation, education, household income, household size, left-right scale, and state of residence. See below table for definitions of other controls.

For completeness, we report the model specification for the regression in the fifth column. The other regressions include a subset of variables as indicated above. See definitions of the variables in Table D.7.2. Support for Hate Crime  $\sim$  Mate Competition + Aggressiveness + Age + Gender + Marital Status + Religion + Education + Income + Household size + Left-Right Scale + Local social services + Local economy + Local crime + Local culture + Islam + Job Competition + Local school + Housing + Living + See Refugees on Road + See Refugees in Stores + See Refugees at Refugee Centers + See Refugees at Schools + See Refugees at Work + Closeness to AfD + State-Fixed effects.

<b>Aggressiveness</b>	Average of 3 Questions If I have to resort to violence to protect my rights, I will I have become so mad that I have broken things Given enough provocation, I may hit another person
<b>Refugee Questions</b>	9 Questions Present a burden on local social services Benefit the local economy Increase crime in my town Enrich the local culture Increase the influence of Islam in my town Make it more difficult to find jobs and training for the residents of my town Be a big challenge for our local schools Increases competition for housing in my town Would change the way in which we live in my town
<b>Contact with Refugees</b>	5 Questions On the road, on public transport or in the park In stores At a refugee center or refugee home At school At work
<b>Closeness to AfD</b>	measure between 0 to 100

Table D.7.2: Variables Included in YouGov Survey Analysis (in addition to “Socio-Demographics”)

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