

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

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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 are a critical but understudied factor driving hate crime. Employing a comprehensive data set 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.*

Verification Materials: The data and materials required to verify the computational reproducibility of the results, procedures and analyses in this article are available on the *American Journal of Political Science* Dataverse within the Harvard Dataverse Network, at: <http://doi.org/10.7910/DVN/QXJDJ5>.

Hate crime is on the rise. In the United States, hate crimes hit a 16-year high in 2018 (Hassan 2019). In Sweden, between 2008 and 2018 they grew by 20%, 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.¹

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.² Notwithstanding the importance of these accounts, we highlight a heretofore understudied factor:

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For helpful comments we wish to thank Jeyhun Alizade, Gordon Aresnoff, Winston Chou, Reilly Everaert, Arun Frey, Alisha Holland, Marius Münstermann, Max Schaub, Rory Truex, Daniela Urbina, Yang-Yang Zhou, as well as three anonymous reviewers and the editors. We are also thankful for feedback received at presentations at the Berlin Institute for Empirical Integration and Migration Research, Boston University, the German Center for Integration and Migration Research, ETH Zurich, Princeton University, and the University of Zurich. This research was approved by the Princeton University Institutional Review Board (#7586) and received financial assistance from the University Center for Human Values at Princeton University.

¹See <https://www.bra.se/bra-in-english/home/crime-and-statistics/hate-crime.html> and Frey (2021).

²For reviews, see, for example, Dancygier and Green (2010), Gerstenfeld (2017), and section “Existing Explanations and Mate Competition.” On government responses, see Bleich (2011).

³Following common usage, we use the terms refugees and asylum seekers interchangeably.

American Journal of Political Science, Vol. 66, No. 2, April 2022, Pp. 501–515

© 2021 The Authors. *American Journal of Political Science* published by Wiley Periodicals LLC on behalf of Midwest Political Science Association DOI: 10.1111/ajps.12595

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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 provoke hate crimes against refugees.³

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 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."⁴

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 data set 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 microfoundations 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 who 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 over mate competition remain a robust predictor of hate crime support when control-

ling 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., Dancygier 2010; Olzak 1992), namely, that majority opposition against minorities rises when the latter are in fact integrating into majority settings and intergroup 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; Pinderhughes 1993). Yet, these attitudes have not been systematically studied, and our article is among the first to do so.⁵ To ensure proper measurement, we conduct list experiments that alleviate concerns about underreporting support for hate crimes, 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 toward 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,

⁴See <http://neuland.mustermann.org/migration/statistik-anteil-maenner-frauen.php>.

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

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.

Existing Explanations and Mate Competition

Anti-Migrant hate crime is a long-standing global problem, but its incidence ebbs and flows across time and space. Why do some localities witness no hate crimes at all, whereas in others refugees become frequent targets of abuse? And why do some people support hate crime against outsiders whereas others do not?

Existing research⁶ can be grouped into two broad approaches: investigations (1) of the structural factors conducive to hate crime and (2) of the characteristics of individual perpetrators. Foreshadowing our approach, we integrate both by highlighting how an understudied structural factor—dating and marriage markets— influences individual threat perceptions of refugees and endorsement of hate crime directed against this group.

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 out-groups become targets of 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 United States, white residents have been shown to commit hate crimes against in-migrating Asians, Hispanics, and African Americans. This tendency is pronounced in previously predominantly white neighborhoods, 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 instance, a permissive stance by the police or lawmakers can embolden perpetrators (Karapın 2002; Wilkinson 2004), whereas well-functioning local governments can reduce violence (Ziller and Goodman 2020). Furthermore, some argue that far-right parties 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 2010; Egami 2018).

Notwithstanding these complex linkages, perpetrator types do map onto contextual features, in that economic insecurity, low educational attainment, and ethnocentrism 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. Attacking an out-group may generate psychic benefits for those who seek to establish superiority. Additionally, it can send a potent message to the out-group—as well as to politicians—that out-group 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 do not 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 criminals with representative surveys. Second, we argue that another key motive lies in perpetrator communities’ desire to prevent outsiders’ access to “their” women.

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 is studied across disciplines (e.g., Arnocky et al. 2014; Becker 1981; Guilmoto 2012; Lichter et al. 1992; Sidanius

⁶This review focuses on hate crime against ethnoracial, not sexual, minorities.

and Pratto 1999). Mate competition also features prominently in social dominance theory (SDT). Based on an evolutionary approach emphasizing 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 cause males to invest less time in raising offspring than females, leading men to pursue mating strategies based on *quantity*, whereas females pursue ones 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 access” to women (McDonald, Navarrete, and Sidanius 2011, p. 192).⁷

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 to SDT, less severe) implications for hate crime. None of the counties during our study period experienced predominantly female refugee migration (see Supporting Information [SI] p. 19, Figure C.10). Our discussion therefore centers on mating threats as experienced by heterosexual men, but we do not rule out sociotropic concerns whereby individuals support hate crime due to partner competition experienced by the opposite sex, relatives, or friends.⁸

We begin with the assumption that, all else equal, local mating pools with disproportionate numbers 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 where preferences for sons and associated sex-selective neglect and abortions generate skewed sex ratios (cf. Dyson 2012; Guilmo 2012; Klasen 2009). Internal migration can also distort sex ratios. As in other advanced economies, German women have been moving to cities, leading to excess men in peripheral regions. Women’s higher educational aspirations and specialization in service (vs.

manufacturing) jobs contribute to gender-imbalanced migration with respect to East–West movements, within Germany as a whole, and cross-nationally (Eckhard and Stauder 2018; for a discussion see SI Appendix A.1, p. 1).⁹

These imbalances have implications for mate competition, which popular media and regional governments have addressed. TV documentaries (e.g., “Tell me where the women are,” “Alone in the North”) and newspaper articles highlight the plight of young 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 (SI Appendix A.1, p. 1–2, contains further information).

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 frequent sites of 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 and the East. Additionally, immigration can skew 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 out-groups are feared and sometimes attacked for their perceived romantic relationships with in-group 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,¹⁰ and it is also

⁷See also Buss (1988) and Sidanius and Pratto (1999).

⁸Results in the section “Empirical Analyses” hold when subset to men (SI Appendix D.6, p. 26).

⁹Our ecological analysis controls for structural factors associated with gender imbalances. SI Tables C.6 and D.5.2 (pp. 14–15) include East–West interactions.

¹⁰Between 2007 and 2016, they rose from 18,608 to 21,375 (Statistische Ämter des Bundes und der Länder 2019); in relative terms, these numbers have remained stable.

true that refugees have dated German women. Yet, perceptions can be distorted. Although 5.2% 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% think they are very common.¹¹

We thus assume that some men will endorse or commit hate crimes against refugees because they or someone they know have personally been affected by refugee–native mate competition, whereas others will do so because they perceive refugee–native mate conflicts without necessarily having had direct experience. As we illustrate in the next section, news sources and social media disseminate the idea that male refugees are partnering 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 women’s honor and safety from “predatory” immigrant men. This trope is prominent in Germany (e.g., Dietze 2016) and elsewhere (e.g., Ryan 2006).¹² Nonetheless, there are reasons to doubt its sincerity, at least as articulated by far-right groups. Attitudes toward women among right-wing extremists are usually quite misogynistic, and violence against women is not problematized (Bitzan 2016; Dancygier 2020). Tellingly, 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 acceptable reference to the “they-steal-our-women” argument. Emphasizing protection allows far-right actors to appeal to mainstream audiences while 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 mate competition that can ensue, have been a topic of public debate.

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.¹³ 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 (Statistisches Bundesamt 2018).

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. Although the initial tenor was welcoming, the mood shifted after 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, climbing to 3,769 in 2016 (for data sources, see the section “Empirical Analyses” and SI Appendix B, p. 8).

Continuous debate about integration challenges accompanied this spike. Although the inflows’ impact on the national culture, economy, and public safety dominated the 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 SI Appendix A.2, p. 3, 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

¹¹Figures are based on a YouGov survey we discuss in the section “Mate Competition and Support for Anti-Refugee Hate Crime.”

¹²It intensified after reports of alleged sexual abuse of German women by refugee men on New Year’s Eve 2015–16 (Frey 2021).

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

commentary.¹⁴ They are mocked and criticized on Twitter, including by the AfD, and have set off hostile reactions. A prominent “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 2021). This reaction, although extreme, is consistent with a generalized sense of threat. 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 a 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 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. 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.”¹⁵ The website *Politikversagen* (“Failure of Politics”), which curates immigration-related stories from across the web, features an article about 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.”¹⁶ An article on another far-right site voices similar concerns: “[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 are attracted to refugees’ “raw, undisguised masculinity,” which stands in stark contrast to “German ‘gender-sissies.’”¹⁷ 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.”¹⁸ Another alarming article states: “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.”¹⁹ 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.”²⁰

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, ranging from the curious to the outright hostile. We argue that the prospect of refugee–native mate competition can create or compound resentment against refugees, including support for hate crime.

Empirical Analyses

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.²¹ The section “Mate Competition and Support for

¹⁴<https://www.youtube.com/watch?v=xvriMBbzb5E> and https://www.youtube.com/watch?v=G37K8_y9HBI.

¹⁵<http://neuland.mustermann.org/human-ethologie-vergleichende-verhaltensforschung/ressource-frau.php>.

¹⁶<http://www.politikversagen.net/was-fluechtlinge-ueber-deutsche-frauen-lernen-muessen>.

¹⁷<http://xn--jrgen-damm-nachrichtenverteiler-oid.de/jouwatch-warum-finden-einheimische-maedchen-fluechtlings-maenner-so-attraktiv/>.

¹⁸<https://www.wissensmanufaktur.net/importierter-frauenmangel>.

¹⁹<https://www.tichyseinblick.de/kolumnen/bettina-roehl-direkt/geschlechterkrise-merkels-demographischer-maennerbauch/2/>.

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

²¹We looked into examining municipalities that restrict labor market access to refugees (to rule out job competition as an alternative mechanism) but found that restrictions correlate with several variables, including sex ratios and unemployment rates. In another robustness check, we turn to placebo analysis; see SI Appendix C.9, p. 18.

Anti-Refugee Hate Crime” 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 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 SI p. 11, Table 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. This range captures competition within and across age groups: When men in older cohorts face shortages of similar-aged women, they seek out women in younger cohorts (Edlund 1999; Kröhnert and Klingholz 2007). The expanded age range also 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 above, 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. It is provided by “*Mut gegen rechte Gewalt*” (“Courage against right-wing violence”), and 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, 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). Although, on its own, each source has its limitations, the use of a wide range of sources and narrowly defined categories is expected to minimize reporting biases. We provide additional details on data reliability in SI Appendix B, p. 8.

Nonetheless, like most analyses of hate crime, we must assume that these crimes are underreported, and

we cannot test for the factors that lead to underreporting.²² As a partial check, we reestimate the analyses on the incidence of physical attacks only (see SI Table C.4, p. 13), which, given their severity, are more likely to be registered than are acts of vandalism, for example. Our individual-level survey does not face these limitations.

Though anti-refugee hate crime shot up significantly in 2015–16, the majority of municipalities do not observe such crimes. In 2015, 5.6% of municipalities (out of a total of 11,168 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 SI Table C.5, p. 14). We estimate two types of models, one in which we aggregate anti-refugee hate crimes over this 3-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 feature a surplus of men.²³ 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.²⁴

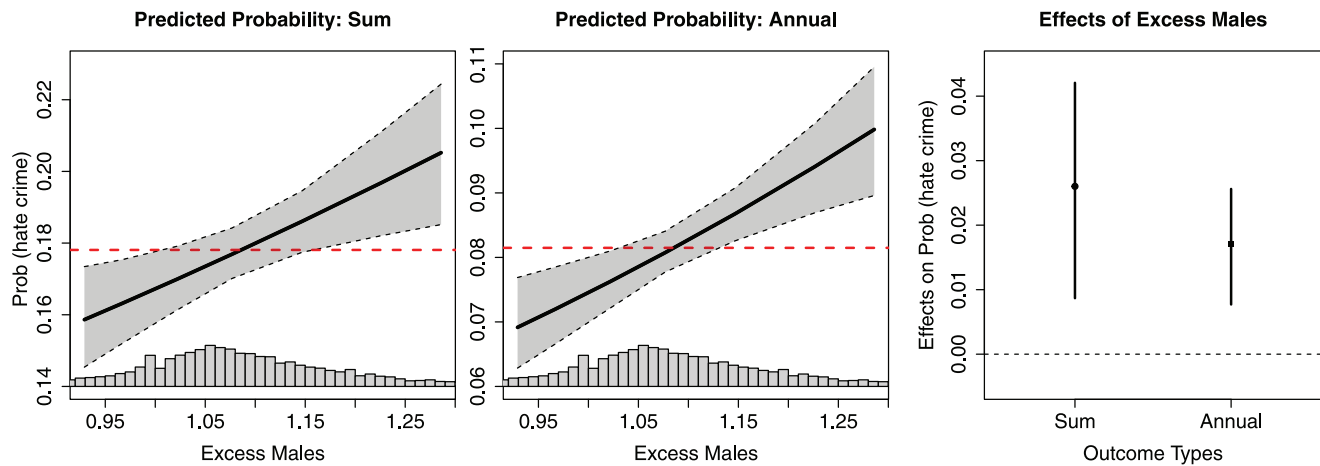
Results in the right-most panel suggest that when moving from a municipality where men and women are evenly balanced to one where there are 120 men for every 100 women (corresponding to the 80th percentile of *Excess Males*), the probability of observing at least one hate crime rises by between 2.60 (95% CI = [0.88, 4.19]) and 1.71 points (95% CI = [0.76, 2.55]). Because 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

²²We discuss potential underreporting biases in SI Appendix B, p. 8.

²³We 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.

²⁴These 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 SI Table C.11, p. 19, 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 SI Appendix C.1, p. 10, for the full results and specification). *Sum* equals one if a municipality witnessed at least one hate crime over the 3-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 SI Appendix C.3, p. 12).

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 SI Table C.6, p. 15). In other words, skewed sex ratios and resulting mate competition are generally associated with anti-refugee hate crime, and their regional distribution also helps explain the 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 of the share of highly educated residents (based on results in SI Table C.1, p. 10).

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. 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 ($r = -0.048$). In the SI (Figure C.8, p. 17), 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. Interaction effects are frequently positive, but often imprecisely estimated. This may be due to coarse measurement at the county versus the municipality level, because we examine hate crime when the number of refugees rose across the board, and when the settlement of refugees is discussed nationwide, priming individuals to notice this inflow locally (cf. Hopkins 2010), irrespective of its size.

Summing up, our ecological evidence introduces mate competition as an important element in anti-migrant violence. We 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 (see SI Appendix C, p. 10-16). To bolster our argument that worries about mating prospects propel some to support violence against refugees, we next turn to individual-level attitudes.

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 we fielded in Germany with the survey firm Respondi helps us answer these questions. The survey consists of four waves (from September 2016 to December 2017). 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 SI Appendix D.1, p. 20). 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:

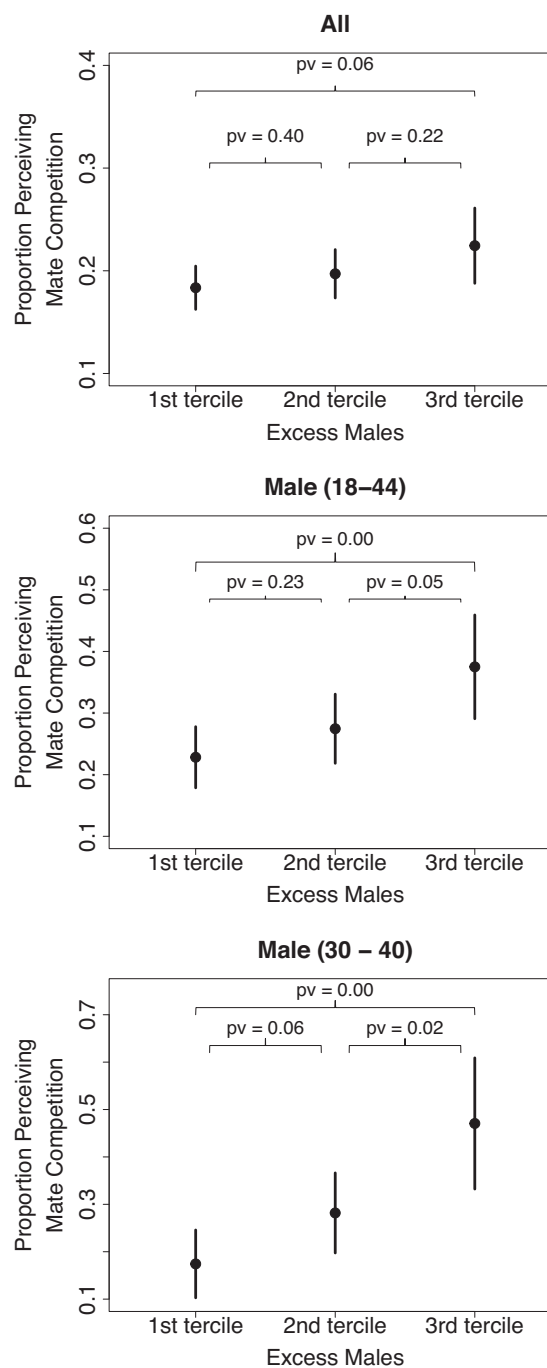
Mate Competition: The inflow of refugees makes it more difficult for native men to find female partners.

For ethical reasons, we decided against experimentally manipulating the salience or incidence of mate competition—we do not want to trigger increases in perceived mate competition if they boost hate crime support.²⁵ We instead present descriptive data below 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

²⁵We also opted against testing whether *decreased* salience reduces support because, in a separate project, we found that 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 implement these or other manipulations.

FIGURE 2 *Excess Males at the Municipality Level and Individuals' Perceived 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 and 30 and 40, respectively.

find female partners, broken down by terciles of *Excess Males* (the data come from Wave 4). The top panel, which covers all respondents, shows that this proportion rises from 0.18 to 0.22 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 bottom 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 0.23 to 0.38. Even more striking, among men for whom, based on their age, forming stable partnerships is most likely a priority, these proportions nearly triple, going up from 0.17 to 0.47. 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 SI Figure D.2, p. 21).

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 who 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, economic) linked to the refugee inflow. If responses to *Mate Competition* are not 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.²⁶ We find that being a single male and *Women's Role* significantly

²⁶This 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 and should therefore be more likely to connect an increase in males (via refugee inflows) with native men's dating chances.

predict *Mate Competition*, even when controlling for 17 other refugee-related views.²⁷ By contrast, these two variables are more weakly (or not at all) associated with answers to the 17 other refugee-related items (see SI Figure D.3, p. 22).

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 audiences²⁸—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.

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

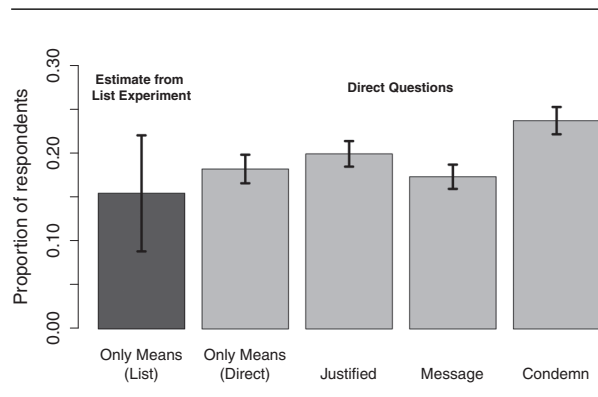
Condemn: Politicians should condemn attacks against refugees more forcefully.

One concern, and perhaps the reason why surveys have not measured hate crime support, 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 at the pilot stage, in Wave 1 and in Wave 2. For brevity we present results from Wave 2 here (SI Figure D.4.1 on p. 23 includes details on Wave 1). We divided 50% of our Wave 2 sample into a control and a treatment group. The control group was presented with three

²⁷The single-male interaction is also positive and significant when controlling for socio-demographic variables.

²⁸See, for example, Dancygier (2010) and Karapin (2002) on these communicative functions.

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.

statements unrelated to hate crime.²⁹ 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 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 response in the control group is lower than that in the treatment group, we have an estimate of the proportion of respondents who condone hate crime. Finally, respondents who were not part of the list experiment (50%) or who were in the control group (25%, together constituting 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 groups (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, although 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 SI Figure D.4.2,

²⁹(1) When it comes to company policy, it is 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.

p. 23) 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 out-group violence. 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 SI Table D.7, p. 29).

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 column).³⁰ 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 $p < 0.001$. 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

³⁰These are age, gender, education, income, main economic activity, employment status, German citizenship, household size, self-assessed social status, religious affiliation, state of residence.

TABLE 1 Mate Competition Predicts Support for Hate Crime

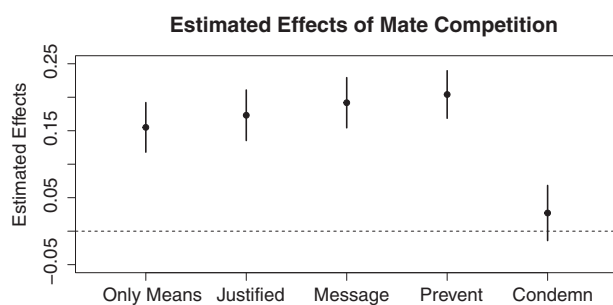
	Dependent variable (OLS): Violence is sometimes the only means					
Mate competition	0.437** (0.016)	0.263** (0.020)	0.236** (0.021)	0.206** (0.019)	0.185** (0.019)	0.155** (0.019)
Job competition		0.250** (0.019)	0.236** (0.019)	0.077** (0.020)	0.065** (0.020)	0.056** (0.019)
Life satisfaction		-0.015* (0.006)	-0.014 [†] (0.007)	-0.003 (0.006)	-0.002 (0.006)	-0.0001 (0.006)
Sociodemographics			✓	✓	✓	✓
Attitudes toward refugees (national)				✓	✓	✓
Attitudes toward refugees (local)					✓	✓
Additional controls						✓
Observations	3,019	3,019	3,008	3,008	3,008	3,008
R ²	0.191	0.240	0.288	0.394	0.410	0.459
Adjusted R ²	0.191	0.240	0.267	0.371	0.382	0.431

Note: OLS with standard errors in parentheses (results are very similar using ordered logit). The dependent variable is *Only Means*, the main independent variable is *Mate Competition* (both range from (1) disagree strongly to (4) agree strongly). See SI Table D.5.1 on p. 24 for results including the other hate crime DVs.

[†] $p < 0.1$; * $p < 0.05$; ** $p < 0.01$.

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 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

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 (with 95% confidence intervals). Results are based on the specification as shown in Table 1 column (6) (with varying dependent variables).

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 judgment (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.³¹ 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.

³¹We thank Winston Chou for helping to conduct this survey.

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).³² 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 $p < 0.001$. These results and variables can be found in SI Table D.8, p. 30.

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

Conclusion

This article 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 eliciting economic or cultural threats (e.g., Adida, Laitin, and Valfort 2016; Choi, Poertner, and Sambanis 2019; Dancygier 2010; 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 and integration.

³²We include the following: (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.

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. Although previous research 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.

We find that integration can be double-edged: Eroding intergroup boundaries in the partner market provoke a native backlash, thereby harming integration in other ways. Future research can build on our findings. First, although 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 ethnonational difference or gender. That hate crimes vary with local gender imbalances indicates that violent reactions are not about ethnonational difference *per se*. Nonetheless, replicating our analyses 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.³³ This scheme might signal equity from the perspective of the native citizenry, and, in doing so, may reduce anti-immigrant opposition in the aggregate. But it does not take into account the threats that refugees face in

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

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 and policymakers 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 more welcoming countries toward 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.”³⁴ 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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³⁴<https://www.amnesty.org/en/latest/news/2016/06/germany-failing-to-tackle-rise-in-hate-crime/>.

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Supporting Information

Additional supporting information may be found online in the Supporting Information section at the end of the article.

Appendix A: Background Information

Appendix B: Hate Crime Data

Appendix C: Contextual Analysis: Incidence of Hate Crime

Appendix D: Survey Analysis