

# **Racial Homophily and Exclusion in Online Dating Preferences: A Cross-national Comparison**

Gina Potârca<sup>1</sup>

*University of Groningen*

Melinda Mills<sup>2</sup>

*University of Groningen*

## Abstract

Although finding a partner online has surged, there is limited knowledge about the characteristics and preferences of individuals. In particular, racial background is a strong determinant of partner selection and a barometer of race relations. The aim of this study is to extend existing research on interracial unions by examining racial homophily and exclusion in online dating preferences across 9 European countries. We analyze data from 9 countries (Germany, The Netherlands, Austria, Switzerland, Sweden, Italy, Spain, France, and Poland) (N= 100,817), distinguishing between majority- (i.e., European) and minority-status racial group members (i.e., Arabic, African, Asian, and Hispanic). A series of multilevel logistic regression analyses reveal that race and education remain robust predictors of partner choices, while structural factors such as relative group size, group-specific sex-ratio and racial diversity in regional marriage markets also play a considerable role. The larger the sizes of their own group, the more likely minority members are to have same-race preferences or to exclude other racial groups. Users living in racially heterogeneous regions have lower levels of racial homophily and exclusion of Europeans, Hispanics or Asians. Regions with strong anti-immigrant attitudes are associated with higher levels of exclusion of all minority racial groups.

*Keywords:* interracial partnering, online dating, cross-national comparison

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<sup>1</sup> Corresponding author. Address: Department of Sociology/ ICS, University of Groningen, Grote Rozenstraat 31, 9712 TG Groningen; e-mail: g.f.potarca@rug.nl

<sup>2</sup> Address: Department of Sociology/ ICS, University of Groningen, Grote Rozenstraat 31, 9712 TG Groningen; e-mail: m.c.mills@rug.nl

## INTRODUCTION

Online dating has become a widely accepted and highly utilized channel for finding a partner. It has surged dramatically, with 37 percent of all single US Internet users looking for a partner reporting that they visited a dating website (Madden & Lenhart 2006). In Germany, the online dating market has witnessed a rapid development, with approximately 5.5 million people seeking a partner online (Schulz et al. 2008). Dutch data showed that between 2000 and 2008, meeting a partner via the Internet was the fastest growing method, even exceeding finding a partner via the classic marriage market of higher education (CBS 2011). The growth in Internet dating is not only related to the boost in information and communication technologies, but also to general societal trends such as the transformations in the area of work and family life and the way people interrelate in developed Western societies (Barraket & Henry-Waring 2008). Individuals not only devote more time to their professional lives, but they migrate more often for their work, leaving the traditional matchmakers of family and friends. This means that people increasingly have to resort to other, more time-efficient means to find a partner. Online dating websites present such an alternative, offering highly systemized interfaces for browsing and getting in contact with prospective mates.

Despite the growth of Internet dating sites, there is little attention to the specific characteristics and preferences of individuals who search for a match in the online environment. The few studies that examine online dating focus on a single national context (Fiore et al. 2010; Hitsch et al. 2010; Skopek et al. 2010). However, as previous cross-national research has shown, there are considerable variations in partnership formation behavior across countries (Hevueline & Timberlake 2004; Mills & Blossfeld 2005). Individual partnering decisions are taken within larger local-specific contexts that have distinct histories, social norms, population composition and marriage markets, which in turn shape partner preferences.

The rise of multiethnic societies, falling of EU borders and rapid immigration has resulted in a higher diversity in multiracial partnership choices, yet previous research has demonstrated that race remains a strong determinant in partner selection (Kalmijn 1998; Jacobs & Labov 2002; Gullickson 2006; Qian & Lichter 2007; Kalmijn & van Tubergen 2010). Racial homophily and exclusion of specific racial groups characterizes all types of romantic relationships, irrespective of their level of commitment (Blackwell & Lichter 2004).

Homophilous and restrictive tendencies have been largely attributed to the role of individual norms and preferences, the influence of family and friends, or structural factors, such as the lack of opportunities for inter-racial contact for meeting and mating (Clark-Ibanez & Felmlee 2004; Kalmijn 1998; Kalmijn & van Tubergen 2010). But does racial homophily and exclusion continue to govern partner preferences in the Internet dating environment? The online dating market benefits from a large pool of potential partners, with theoretically lower structural pressures and social control, which should in turn mean that individuals are free to pursue genuine preferences. Due to data restrictions, previous research has focused almost exclusively on studying the behavioral outcome of marriage, not being able to set apart the effect of individual preferences from the influence of structural settings. Furthermore, the majority of studies on interracial unions have been conducted in the United States, a classical immigrant country with a distinctive tradition in race relations, leaving relatively fewer studies conducted outside of this context.

Building on previous literature on interracial marriages, this paper extends existing knowledge by studying the extent to which racial homophily and racial exclusion of particular groups governs partner preferences in the Internet dating environment across 9 diverse countries in Europe. Applying the theories of interracial social distance (Bogardus 1947), in-group preferences (Fu 2001; Kalmijn 1998), social dominance orientation (Pratto et al 1994), and social structure theory (Blau 1977; Merton 1941), we propose a series of hypothesis referring to individual- and regional-level factors that underlie racial preferences. By accounting for both multiple levels of variation, we acknowledge that preferences are simultaneously influenced by individual factors, as well as the broader contextual characteristics of local marriage markets, which play a role in anticipating opportunities for contact in online settings. Racial homophily and exclusion refer to stated preferences for dating partners with a similar or different racial background. We distinguish between five mutually exclusive racial categories, which in this context refer to the majority population of Europeans, and four minority racial groups. Europeans are the ‘native’ population of whites (i.e., Caucasian). Racial minorities denote populations of non-European origin (i.e., Arabic, African, Hispanic, and Asian), irrespective of birthplace, which reside in particular countries. After describing our novel cross-national Internet dating data, we then focus on the analytical methods used in the study, followed by the main results and a discussion of the implications of this research, limitations and future directions.

## BACKGROUND: INTERRACIAL MARRIAGE & IMMIGRATION

### *Interracial Marriage Patterns*

Interracial marriage, defined as the marital union between two individuals of different racial ancestries, has been subject to extensive empirical research in the US during the last decades, attributed to increasing multicultural and racially mixed societies (Burton et al. 2010). The main racial divisions addressed in the literature refer to the native white population, on the one hand, and the non-white immigrants and their descendants, on the other hand. The study of the incidence and determinants of interracial marriage is important to study since it serves as an accurate indicator of the endurance of group boundaries and of the social and cultural distance between the different racial groups (Fu 2001, Kalmijn & van Tubergen 2010, Lucassen & Laarman 2009). Compared to other measures of integration, intermarriages between minority non-whites and majority whites represent a reliable measure of assimilation and the blurring of racial divides (Alba & Nee 2003, Gordon 1964). This is largely attributed to the fact that having a racially distinct partner has far-ranging consequences on daily activities and lifestyle (Lucassen & Laarman 2009), as well as the social network (Kalmijn & van Tubergen 2010) of individuals.

Recent patterns of interracial marriage reported by existing studies refer to the persistence of a racial hierarchy in the US, implying different degrees of crossing racial lines (Fu 2001) and various trajectories of assimilation (Alba & Nee 2003). Hispanics and American Indians have the highest chances of entering marital unions with whites, followed by Asian Americans, while African Americans remain the least likely to have a white spouse (Qian & Lichter 2007). Further research based on census data reveals that the interracial marriage market is even more restrictive towards lower-educated blacks, exclusion that is largely attributed to residential (Gullickson 2006) or educational segregation (Jacobs 1997).

While trends in racial intermarriage are thoroughly documented in the US literature, research on interracial partnerships in Europe remains scarce. The European studies of mixed marriages that do exist mainly examine unions between immigrants and natives, employing ethnic and national-origin group divisions and usually focusing on a single national context (e.g., Germany: Gonzalez-Ferrer 2005; the Netherlands: Kalmijn & Tubergen 2007; Sweden: Dribe &

Lundh 2008). The lack of comparative research is largely attributed to differences in the diverse ethnic composition between countries, the coding and registering ethnic categories, as well as different periods of observation (Lucassen & Laarman 2009). Furthermore, the type of migrant populations in Europe are fundamentally different than in the US, which means that it is uncertain whether American findings about intermarriage can be generalized or applied to European contexts (Dribe & Lundh 2008).

### *Immigration patterns in Europe*

The massive immigration flows across Europe during recent decades has placed interethnic integration and immigration as a core topic on the political agenda, resulting in a diversity of policies and philosophies of integration (Favell 2001), as well as new configurations of interethnic and interracial social dynamics (Foner & Bertossi 2011). Bail (2008) examines the different faces of immigration across the European Continent by accounting for variation in: 1) the timing and sources of migration, 2) the size and origin of immigrant groups, and their ranking on the labor market, 3) citizenship and civic inclusion policies; and, 4) philosophies of integration. Northern and Western European states (e.g., Austria, France, Germany, the Netherlands, Sweden, and Switzerland) are usually referred to as traditional host countries, having a long history of migration initiated after the Second World War and including mass migration flows (driven by labor market demands) incoming from Southern European, as well as ex-colonial African, Caribbean and Asian countries (Triandafyllidou et al. 2008). Western and Northern European states later imposed more restrictive admission policies, which were mainly fueled by economic crises and social unrest regarding the balance between multiculturalism and assimilation of foreign residents. By the late-1980s and mid-1990s, Southern European countries (e.g., Spain, Italy) started to receive large immigrant populations from Latin America, North Africa, Middle East, and Eastern Europe (Bail 2008). However, the Southern part of the Continent faced considerably more illegal and refugee migration flows, which was generally fostered by tentative regulation and integration policies. This in turn meant that the public debates in these contexts are more centered on control, criminality and national identity issues (Triandafyllidou et al. 2008). Central and Eastern European countries (e.g., Poland) are currently experiencing small-scale immigration of high-skilled Western European and US workers,

temporary migration of Asian citizens in transit towards Western Europe, as well as unregistered immigration from non-EU Eastern European states (Triandafyllidou et al. 2008).

Table 1 provides a contemporary overview of the size and characteristics of the foreign-born population in each of the 9 countries included in the current study, which illustrates the considerable variation across national contexts. While the foreign-born represent almost a quarter of the total population in Switzerland, they constitute only 1.4 percent of the Polish population. The table also shows that in Poland the highly-educated are more likely to be foreign born, as opposed to the opposite trend in Spain. Switzerland has the highest employment rate of foreign-born residents, while Spain and Italy have the largest shares of people at risk of poverty or social exclusion among the foreign-born population.

## THEORETICAL FRAMEWORK

### *Racial Preferences in Romantic Relationships*

There are three factors that influence individuals' partner choice, namely the: (1) preferences of individuals for certain partner attributes, (2) influence of third parties (i.e., ways in which marriage candidates identify with the social groups they belong to and potential sanctions that deviations from the norms might attract); and, (3) structural constraints imposed by the marriage market where they are searching for a spouse (Kalmijn 1998). Until now, research on interracial romance has struggled to disentangle the effects of these three determinants. High rates of marital unions between members of two distinct racial groups could simultaneously indicate out-group partner preferences, limited interference by third parties or an extensive pool of potential partners and opportunities for interracial contact.

One way of directly assessing an individual's racial partner preferences (and therefore isolating this effect from the influence of opportunities and third parties), is to examine online dating profiles. Unlike laboratory studies or survey data, Internet dating information provides an ecologically valid true-to-life context for examining the initiation of romantic relationships on an unprecedented scale and level of detail. Moreover, we deal with accurate expressions of racial preferences with tangible consequences, eliminating the effect of social desirability (Yancey

2009). The users of online dating platforms can choose to interact with people that might be underexposed in traditional match-making settings (Sprecher 2009). Therefore, analyzing genuine preferences for dating different-race partners can provide a more reliable measure of the strength of racial divisions than studying marriage rates. This is due to the fact that marriage rates are highly distorted by the effects of geographical proximity and opportunities for interaction (Fisman et al. 2008; Yancey 2009). The previous focus on marriage in the study of interracial partnerships was also unable to capture the broader reality of mixed romantic pairings and the rise in the incidence and variability of non-marital family forms (e.g., cohabitation, long-term dating, living apart together). Examining successful marriages only does not represent the most appropriate tool in understanding the social distance between various racial groups (Gullickson 2006). In order to better understand how racial selectiveness is formed, we need to shift the focus to the initial stages of relationship development (McClintock 2010; Yancey 2009) and examine pure preferences and selection criteria, not only registered marital matches (Fisman et al. 2008). Furthermore, by examining marriages, there is the issue that only successful partnerships are examined, making it a selective population.

The few studies that specifically inspect racial preferences in dating are undertaken in the U.S. and rely on either speed-dating experiments based on a sample drawn from the student population of a single American university (Fisman et al. 2008), or online dating profiles from mainstream personal systems (e.g., Yahoo! Personals, Match.com). Among such studies, one targets users from four cities in the US (Robnett & Feliciano 2011), while some focus on a particular racial group (African Americans: Yancey 2009, Wilson et al. 2007; Hispanics: Feliciano et al. 2011). Research is yet to address the country-specific mechanisms driving racial homophily and exclusion in partner preferences, making the present study the first one that employs a comparative perspective across several European countries.

### *Racial homophily and racial exclusion*

A core theoretical approach used to explain patterns of interracial romance, in particular racial homogamy, combines arguments that refer to in-group preferences (Fu 2001; Kalmijn 1998) and the social distance between different racial groups (Bogardus 1947; McClintock 2010).

According to Kalmijn (1998), individuals' predilections for members of their own group reflect expectations for cultural similarity and the advantages that being matched to a partner that shares the same values and beliefs can bring. This includes factors such as mutual behavioral confirmation, the certainty of having interests and lifestyles in common, and opportunities for shared activities. The cultural capital with which individuals present themselves on the dating market is highly dependent on their racial background. Chiswick and Houseworth (2011) argue that choosing a partner with similar cultural resources enables a more effortless attainment and transmission of cultural 'goods' to the next generation. A strong sense of community and identity within your own racial group also fuels feelings of separation and unrelatedness towards members of other groups, producing intergroup social distancing and a hesitancy to engage in close interactions with racially different individuals (Bogardus 1947).

The cultural gaps that separate racial groups are driven by religious disparities in values and practices to a high extent; however, racial divides do not strictly overlap only with religious divisions. In fact, many of the European countries under focus (e.g., France, Sweden, the Netherlands) are highly secularized societies and many racial groups (e.g., African, Asian, Indian) are not linked to a singular religious denomination. Same-race preferences stem not only from religious considerations, but also from patrilineal family systems and traditions that are transmitted from one generation to the next and relate to attitudes towards equality and authority between family members (Lucassen & Laarman 2009, Todd 1985). Overall, in-group preferences are recognized to be driven by several needs (Hagendoorn 1995), such as the need for certainty and safety resulting from being in contact with culturally similar individuals (Hutnik 1991), the need for in-group cohesion and support (Sumner 1906), and the need for maintaining a positive social identity by assessing out-groups less favorably than the in-group (Tajfel 1982).

In-group partner preferences are present to a different extent for different groups. Here we can draw upon the theory of social dominance orientation to understand an additional mechanism of why majority and minority group members have different partner preferences. Pratto and colleagues (1994) propose the theory of social dominance orientation, which points to individuals' need to belong to a group that dominates over out-groups and the inclination to maintain a hierarchical arrangement favorable to the in-group. The implication of this theory for dating preferences is that dominant status group members will be more reluctant to cross racial



lines because being romantically linked to a lower status (i.e., minority) group member attracts a state of equality that disrupts the previous hierarchy. Lower status group members, conversely, would be more willing to date higher status persons since this would result in an advantageous ‘upgrading’ from an inferior to an equal status (Yancey 2009). Given that the majority’s (i.e., European Caucasian group) goal is to preserve the dominant hierarchical status that they hold due to their significant size in the population, their same-race partner preferences and tendency to dismiss other racial groups should be more pronounced. On the contrary, racial minority groups will be inclined towards advancing their status to the same level as that of the majority group and integrate into the host culture, resulting in attenuated preferences for meeting others exclusively within their own race.

The abovementioned explanation of the different theoretical mechanisms of how partner preferences are shaped, lead to the first hypothesis:

*Hypothesis 1:* Majority-status members will have higher levels of racial homophily and exclusion in partner preferences compared to all minority group members.

Previous research that has focused on social distances between ethnic and national groups has documented the existence of a ranking system of out-groups, as well as an agreement on the positions held by specific out-groups in this hierarchy (Hagendoorn 1995). Not only have the dominant groups perpetuated stereotypical and social distance rankings. Minority groups consent and replicate such hierarchies themselves, although to a lesser extent. By perpetuating a pattern of negative out-group evaluations, the dominant group benefits by reinforcing its high ranking position and derogating competing subordinate groups that might threaten the status-quo (Blumer 1958). Minority groups distance themselves from similarly positioned groups at the lower end of the scale in order to preserve a positive social identity (Hagendoorn 1995). Due to their demographically dominant status, Europeans (from Northern, followed by Southern and Eastern countries) rank first, whereas Asian, African and Middle East groups appear at the bottom of the hierarchy (Hagendoorn et al. 1998). Hispanic groups usually hold an intermediate position (e.g., Snellman & Ekkehammer 2005). Evidence for stable social distance rankings of ethnic/racial out-groups is found in the Netherlands (Hagendoorn & Sniderman 2001), Sweden (Snellman & Ekkehammer 2005) and the former Soviet Union (Hagendoorn et al. 1998). Based on these considerations, we hypothesize that:

*Hypothesis 2:* Exclusion is hierarchical, with European group and own group being the least excluded, Hispanics ranked in the middle, and Asian, African and Arabic group members as the most excluded at the bottom of the hierarchy.

*Individual-level determinants of racial homophily and exclusion in partner preferences*

It is essential to examine the occurrence of racial homophily and exclusion within the context of other individual attributes beyond racial group membership (Fu 2001). Another central factor that shapes the rigidity of racial divides and same-race partnering and restrictive preferences, in particular, is education. An extensive series of studies (Kalmijn 1998; Meng & Gregory 2005; Qian 1997; Qian & Lichter 2007) demonstrated that the higher educated are less restrictive in their racial partnering preferences, irrespective of their own racial group membership. The main argumentation is that higher educational attainment is associated with broad-mindedness and willingness to experiment in terms of dating, as well as perceiving identity in attributes other than race (McClintock 2010). In addition to having a more receptive attitude than their lower educated counterparts, they are less exposed to the influence of family and community of origin (Kalmijn 1998) because of higher chances of migrating for school and work. More time in educational training also attracts more opportunities for frequent interaction with people of various backgrounds, which increases familiarity and the ability to relate to out-group members (Cohen 1977). The structural effect of this exposure also means that the highly educated have more opportunities for getting into contact with potential partners of different races. As previously mentioned, the analysis of online dating allows us to disentangle the effect of opportunities in the dating market from the effect of genuine racial preferences.

In the case of racial minorities, there might be yet another mechanism that explains the differences in racial homophily and restrictive preferences between the lower and the higher educated, particularly when it comes to the exclusion of European users. Status exchange theory (Davis 1941, Merton 1941) proposes that mixed-race partnerships are an intrinsic exchange in which both partners trade status characteristics. Generally used with reference to the black–white racial divide, the theory predicts that highly educated blacks would have higher chances of having a white spouse than lower educated blacks, because they are able to barter their high level

of education with the high racial status of their white partner. Based on similar reasoning, lower educated whites would be more open to partnering with a black person, provided that they possess high educational endowments in exchange for their higher racial status. Empirical evidence for these theoretical claims has been found in multiple studies, which confirm status exchanges in marital unions between Hispanics and whites (Fu 2001, Qian 1997), or between blacks and whites (Gullickson 2006, Fu 2001). Therefore, highly-educated minority members are capable of matching with more appealing partners (i.e., belonging to the majority group) because they can compensate for their lower racial status with their educational status advantage (Fu 2001). This means that, when expressing their partner preferences in terms of race, minority members with high levels of education can be more confident in ‘demanding’ partners from the dominant racial group, which translates into less exclusion of Europeans. Finally, highly educated minority members are generally more prone towards dating out-group members given that higher education usually attracts a better assimilation into society, an increase in interracial contact and a decrease in in-group favoritism (Lieberson & Waters 1988).

Drawing from these theories, we can conclude that being highly educated negatively influences the extent that users prefer dating same-race individuals or exclude certain racial groups (either majority or minority). The following hypothesis thus states:

*Hypothesis 3:* Higher educated individuals will have lower levels of racial homophily and exclusion in partner preferences compared to those with lower educational levels.

#### *Other individual-level predictors of racial homophily in partner preferences*

Finally, in order to avoid confounding effects, we take into account a set of control variables previously identified as associated with partner racial preferences. This includes socio-demographic and family life-course characteristics, importance awarded to partner’s race, as well as self-perceived physical attractiveness. Individuals with higher levels of racial homophily and exclusion in partner selection tend to be female (Belot & Fidrmuc 2010; Fisman et al 2008; McClintock 2010; Yancey 2009), older (Yancey 2009), and belonging to Christian religious denominations (Yancey 2002). Moreover, we control for previous relationship experience,

having children from past relationships and the importance awarded to race and self-described physical attractiveness.

*Contextual-level determinants of racial homophily and exclusion in partner preferences*

Blau (1977, 1994) proposes that opportunities to initiate and construct relations with out-group members are the product of structural settings, which provides a structural interpretation of homophily and intergroup relations. Interpersonal choices are largely determined by the social configuration in which the individual is embedded. What appears as personal preference or interest may be in fact highly structurally driven. By virtue of its design, this study is more equipped to isolate the effect of preferences from the effect of structural opportunities by focusing on a dating market that provides numerous opportunities for inter-racial contact, as well as reducing the influence of third parties and contextual pressures. Nevertheless, homophilous preferences in terms of race and tendencies to exclude possibilities of contact with certain racial groups continue to be shaped by the structure of the online dater's resident environment and the influence that context has on anticipated opportunities for contact and openness for mixed-race partnering. The actual racial composition within one's immediate environment impacts an individual's estimations of the racial availability of mates. Individuals with an African background, for example, who reside in areas where their racial group is relatively small, are likely to anticipate that their chances of meeting a same-race partner online as proportionally lower and thus adjust their preferences. We contend that the main structural determinants known to affect crossing racial lines in traditional marriage markets (e.g., relative group size, race-specific sex ratios, and racial diversity) also influence expected opportunities for online interaction. Due to the considerable local variation in racial composition and marriage markets within countries, all contextual-level predictors are proposed at the regional as opposed to the national level.

The relative group size refers to the 'logic of numbers' (Kalmijn 1998: 402) as one of the main determinants of in-group choices in marriage markets. Individuals belonging to relatively smaller racial groups face lower chances of being romantically involved with people of the same background compared to the higher chances of larger racial group members who benefit from

more frequent opportunities for contact (Blau & Schwartz 1984; Kalmijn 1998). In online dating, members of large groups are more likely to anticipate greater chances of meeting members of their own group, meaning that they will be more likely to display higher levels of racial homophily and exclusion of specific racial groups. Members of smaller minority groups will in turn expect low opportunities for in-group contact and thus be less restrictive, which leads to the following hypothesis.

*Hypothesis 4:* Minority-status members whose group size (at the regional level) is larger will have higher levels of racial homophily and exclusion in partner preferences compared to minority-status members whose group size is smaller.

Moreover, it is not only the regional size of the group that has the potential to influence online daters' racial preferences, but also the group-specific sex ratio, i.e., the ratio of men to women in a given racial group. Several studies demonstrate that unbalanced sex ratios – due to the fact that international migration is mainly driven by the male population – predict the likelihood of crossing racial boundaries in marital unions among immigrant groups (e.g., Angrist 2002; Landale & Tolnay 1993; Lucassen & Laarman 2009). A high sex-ratio (i.e., more men than women within a group) would mean that there will not be enough potential female partners from one's own group to meet, which would result in a higher tendency for interracial preferences. A skewed gender distribution of one's own racial group prompts online daters to take into account the scarcity of available mates within their local area and in turn express less homophilous and less selective partner preferences. In sum, we hypothesize that:

*Hypothesis 5:* Minority-status members for whom the group-specific regional sex ratio is unbalanced will have *lower* levels of racial homophily and exclusion in partner preferences compared to minority-status members for whom the group-specific regional sex ratio is balanced.

As Europeans represent the dominant racial group in all regions of all countries under focus, ubiquitously displaying large group sizes and balanced sex ratios, the effect of these first two contextual variables will be studied with particular attention to minority racial groups.

Furthermore, we expect racial diversity and heterogeneity within regions to reduce the levels of racial homophily and exclusion of specific racial groups. Regions where there is a more

even spread of racial composition should result in increased opportunities for meeting potential partners belonging to other racial groups (Blau et al. 1984). According to contact theory (Allport 1954), frequent interactions with out-group members provides individuals with the tools to understand other cultural lifestyles, reducing tendencies to stereotype and discriminate. Many studies have found a robust association between racially or ethnically mixed regions and increased incidence of interracial unions, suggesting that melting pots attract familiarity which in turn increases openness for intergroup contact (e.g., Turks and Moroccans living in ethnically heterogeneous regions in Belgium (Lievens 1998); Blacks and Native Americans residing in racially diverse regions in the United States (Bratter & Zuberi 2001). Based on this theory, we have the following expectations.

*Hypothesis 6a:* Individuals living in regions with higher racial diversity will have *lower* levels of racial homophily and exclusion in partner preferences compared to those living in regions with lower racial diversity.

The contextual characteristic of racial diversity could, however, also have an adverse effect. Racially mixed regions could also be a source of social anxiety. Conflict theory (Blumer 1958; Coser 1956; Putnam 2007) suggests that increased diversity causes perceived inter-group competition over resources, which prompts a strong loyalty to one's own group, hinders interracial trust, and results in racial segregation. Although the effect is marginally significant, Fisman and colleagues (2008) find that exposure to other races influences racial preferences in speed dating. This leads us to consider a second, competing, hypothesis:

*Hypothesis 6b:* Individuals living in regions with higher racial diversity will have *higher* levels of racial homophily and exclusion in partner preferences compared to those living in regions with lower racial diversity.

Finally, using Kalmijn and van Tubergen's (2010) theoretical division of the two structural determinants of structures of opportunities and cultural factors, we propose that differences in racial homophily and exclusion of specific racial groups are also related to local-level variations in tolerant attitudes towards external groups. Jacobson and Heaton (2008) examine cross-cultural dissimilarities in patterns of interracial marriage and show that high rates of homogamous marital unions are associated with societies that display strong proscriptive

norms regarding inter-group marriage. Speed-dating research also indicates that aggregated attitudes against interracial marriage and neighborhood restrictive preferences in the individual's place of origin positively influence their level of racial homophily in partner preferences (Fisman et al 2008). We therefore include anti-immigrant attitudes as a measure of permissiveness towards groups different from one's own. An extensive body of literature mostly looking at Western European countries provides evidence for rising levels of anti-minority and anti-immigrant attitudes (e.g., McLaren 2003; Pichler 2010; Semyonov et al. 2006; Weldon 2006), which strongly influence inter-group contact and general social cohesion (Schneider 2008). A tense societal climate regarding immigration and the threat of out-groups extends to the realm of romantic relationships and most likely enhances people's tendencies to date same-race partners and to dismiss contact with people from other ethnic backgrounds. This leads to our final hypothesis.

*Hypothesis 7:* Individuals living in regions with more pronounced anti-immigrant attitudes have *higher* levels of racial homophily and exclusion in partner preferences compared to those living in regions with less pronounced anti-immigrant attitudes.

## DATA, MEASUREMENT AND ANALYTICAL METHODS

### *Data and sample*

We analyze anonymized data from a multinational online dating company of profile and preference information recorded in September 2011. The company is based in several European countries, including the 9 countries under focus in this study: Germany, The Netherlands, Austria, Switzerland, Sweden, Italy, Spain, France, and Poland. The sample size in each country ranges from 1,127 (for Italy) to 31,577 (for France), with a total sample of 100,817 heterosexual members. Although the samples are not nationally representative, comparisons with national statistics (available upon request) show that they mirror the gender and age composition of the general population in each country. In order to avoid potentially biased estimations due to their dominantly large group size, the European group has been under-sampled by extracting a random

sample of the European members that equals the size of the largest minority group. The website offers online matchmaking services targeted at long-term relationships and it provides the possibility of enrolling as either a non-premium (free) or a premium (paid) member. The non-premium membership includes registration, the possibility of filling in a personality test (i.e., a questionnaire which each user needs to complete in order to activate their profile) and the chance of browsing through the proposed profiles of other members, without being able to inspect their photos or to exchange e-mails. In order to gain access to pictures and to establish and react to contacts with other members, a monthly subscription fee is required (premium membership).

In addition to the personality test, the entry questionnaire also includes personal information about the individual (e.g., age, occupation, educational level, race, religion, city, marital status, height, self-perceived physical appeal, lifestyle habits etc.), importance awarded to several aspects (e.g., partner's race, partner's religiosity, partner's physical appearance etc.), as well as preferences for potential partners in terms of age, height, geographical location, fertility history and plans, educational level, income, lifestyle habits, race, and religion. The 'partner proposals' presented to the individual include information concerning basic socio-demographic details (i.e., the standardized personal information that each member reveals, as presented earlier), a detailed account of their personality profile, and self-descriptions, which contain freestyle answers to items such as 'what my partner should know about me', 'three things that are important to me' or 'what I look for in a relationship'. After becoming an active member, users can refine the list of suggested partners based on the aforementioned criteria. The data analyzed in this study focuses on the selection criteria that users impose in terms of race as main independent variables, as well as their socio-demographic data records, self-perceived physical appeal, and importance awarded to various aspects as either explanatory or control factors.

Finally, we use the postcode information to cluster individuals into different regional areas in order to link them to macro-level variables that measure their environment, such as group size, race-specific sex ratio, racial diversity, and anti-immigrant attitudes, which are taken from statistical offices or cross-national surveys, described below. The regional units correspond to the Eurostat's Nomenclature of Statistical Territorial Units classification scheme (NUTS). In order to comply with data confidentiality agreements, we were required to code regions at the



NUTS-1 level, which corresponds to large scale regions (ranging from 3 million to 7 million inhabitants). This resulted in 59 regions.

### *Measurement of variables*

#### *Individual-level variables*

*Dependent variables.* Following Robnett and Feliciano's (2011) study on racial exclusion patterns among Internet daters in four US cities, we constructed six dependent variables that are constructed according to racial homophily (i.e., excluding everybody but one's own race) and exclusion of specific racial groups. The accent is placed on exclusion rather than willingness to date given that expressing preferences for dating certain racial categories can mean that an individual is keeping options broad or avoiding a politically incorrect image towards one's self, while preferences against certain racial groups (i.e., exclusion) reflect clear intentions of not wanting to interact with members of those particular groups. Therefore, a focus on exclusion therefore depicts a more genuine and precise measure of racial preferences.

The first variable of *racial homophily* is dichotomous, taking on the value of 1 if the individual indicates a preference for racial homophily (i.e., is only willing to date a same-race partner) and 0 if otherwise. When describing their own race, individuals are asked to place themselves in one of the following seven categories: European, African, Asian, Arabic, Indian, Hispanic (Latin American), or other. In relation to the race(s) of their potential match, users can select between one or as many of the following eight possibilities: European, African, Asian, Arabic, Indian, Hispanic, other, or any (i.e., it does not matter). We combine the information provided by these two variables to identify users that only accept dating people that have the same race as their own. The Indian and Asian categories were recoded into a broader Asian category as the differentiation between the two groups is not explicit. The remaining five outcome variables defining *exclusion of specific racial groups* are also dichotomous. The value of 1 indicates whether the user excludes dating Europeans, Arabs, Africans, Hispanics, or Asians.

*Educational level.* Each of the nine countries under study has a particular categorization for education, which we harmonize and group following the International Standard Classification of Education (ISCED) code. We differentiated between three educational levels and created three

dummy variables, which range between: low (ISCED levels 0, 1 and 2, reference category), medium (ISCED 3 and 4) and high (ISCED 5 and 6).

The *control variables* include sex, measured as a dummy variable (male: reference group); age, which is recoded into a six-category variable (under 20 years old: reference category, between 21 to 30 years, between 31 to 40 years, between 41 to 50 years, between 51 to 60 years, and over 60 years old); religion, which distinguishes between Christian (reference group), Muslim, Buddhist, atheist, non-religious believer, and other denominations. The family life-course control measures refer to marital status and the number of resident children. Marital status is a categorical variable with the following four options: never married (reference category), divorced, separated, and widowed. The number of resident children is measured by asking users about the number of children living with them, and it varies between none (reference category), one child, two children, and three or more children. We also control for the importance given to match's race and self-described attractiveness, which are both measured on a seven-point scale ranging from 1 meaning 'extremely low' to 7 standing for 'extremely high'. The dating intentions are measured by looking at the user's type of membership, which can be either non-premium or premium. We assume that having a premium membership represents a stronger commitment to dating.

#### *Contextual-level variables*

For the first three independent variables at the regional level, we used data from the 2001 census provided by Eurostat (2010), which contained information on citizenship status at the NUTS-3 level (referring to micro regions), by gender. We aggregated these figures to the NUTS-1 level and recoded the citizenship categories into broad racial categories by choosing the dominant racial group corresponding to each nationality. For example, due to the prevalence of Arabic backgrounds in Northern Africa, foreign residents originating from these countries were clustered into one Arabic racial group, which also includes persons from Near and Middle East Asian. Foreign residents from other African countries were grouped into the African category, and the European, Australian and North American citizens were clustered into a broader European group, which corresponds to the White/Caucasian race. The population born in Latin America was coded as Hispanic, while residents coming from Asian republics of the former Soviet Union and other Asian countries were grouped under the Asian category. Finally, the

foreign population originating from Oceania or other forms (e.g., no nationality or unclear) were grouped as ‘other’. Based on these aggregate categories, we were able to construct our group size measures for each racial category at the regional level. Although the original census figures are slightly outdated and the coding scheme refers to nationality instead of ethnicity or race, we opted to use this measurement, since it provides a sufficient and unique amount of information about the racial composition of regions.

*Relative group size* is the percentage of the total population of the number of residents belonging to a certain racial group, measured for each region. The variable is recoded in three categories: smaller than 1.0%, between 1.0% and 1.9%, and between 2.0% and 5.0%.

*Race-specific sex ratio* is the natural log of the ratio of men to the number of women in a racial group, per region. As opposed to proportions, natural logs ensure the symmetry of the sex ratio measurement (Cready & Saenz 1997). The variable is recoded in two categories with values between -0.05 and 0.05 corresponding to balanced sex-ratios and the rest being categorized as skewed sex-ratios.

*Racial diversity* is measured by using the M6 index (Gibbs & Poston 1975) based on the number of racial categories and the number of persons in each category. For each region, the following formula is employed:

$$N_g \left[ 1 - \frac{(\sum_{i=1}^g |x_i - \bar{x}|) / 2}{\sum_{i=1}^g x_i} \right]$$

where  $N_g$  represents the number of racial groups and  $x$  is the sum of persons within each racial category. High scores on the M6 index represent high levels of racial diversity.

*Anti-immigrant attitudes* are measured by aggregating responses from the fifth round of the European Social Survey (ESS 2010<sup>3</sup>), using the responses to the questions ‘Would you say it is generally bad or good for [country]’s economy that people come to live here from other countries?’, ‘And, using this card, would you say that [country]’s cultural life is generally undermined or enriched by people coming to live here from different countries?’ and ‘Is [country] made a worse or a better place to live by people coming to live here from other

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<sup>3</sup> Due to the lack of information for Austria and Italy in the ESS (2010) data set, the same measures are taken from the data set corresponding to the second round of the ESS (2004).

countries?’ All three questions have 11-point answer scales ranging from 0 to 10 where low values refer to negative assessments of the consequences of immigration. After validating the consistency of items (i.e., Cronbach’s alpha values higher than 0.80), a mean score was computed based on the answers to the three questions. To simplify interpretation of results, the scores have been transposed so that high scores point toward higher anti-immigrant attitudes.

### *Methods of analyses*

We first engage in descriptive statistics to examine the key socio-demographic characteristics of users included in our sample. We then estimate multilevel logistic regression models using the *runmlwin* command (Leckie & Charlton 2011) in Stata. The models include random intercepts that allow for the existence of variation in racial homophily and exclusion across the 59 regions, net of individual characteristics. In this way we account for the hierarchical nature of our data and can test the effect of contextual factors.

As indicated previously, racial homophily and exclusion tendencies are shaped by both individual factors and contextual variables, or in other words”, by the ‘characteristics he or she brings to the marriage market’, as well as the ‘characteristics of the marriage market itself’ (Cready & Saenz 1997: 352). The existence of different levels of variation is the precise principle that underlies multilevel analysis (Snijders & Bosker 1999). The current analysis attempts to distinguish the variations at the individual and regional level, with the first step engaging in the estimation of empty models (see Table 3), which provide an initial insight into the variances at the regional level. Given that the likelihood ratio statistic provides strong evidence that the between-regions variance is non-zero for all six empty models, we proceed with the second stage of the process, which is the inclusion of individual-level explanatory and control variables. This is then followed by the introduction of regional-level explanatory variables. Given that we are only interested in testing the effect of group size and sex ratio with respect to minority racial groups, separate models are estimated for a sample including only minority members. All models are initially fitted using first order MQL parameter estimates, while final models are based on the more accurate second order PQL approximation.

## RESULTS

We first show descriptive statistics in relation to our sample and then turn to the testing and discussion of our hypotheses with reference to the multivariate results of multilevel logistic regression analyses.

### *Descriptive results*

Tables 2A and 2B present descriptive statistics for the variables used in the analyses of racial homophily and exclusion, by racial origin. The first part of Table 2A provides a raw assessment of how homophilous and restrictive towards specific racial groups online daters with different racial backgrounds are. Recall that users are requested to choose at least one racial group. European members (56.6%) specify that they are willing to date a same-race partner in a significantly higher proportion compared to all minority racial groups (19.3% for Arabs, 5.3% for Asians, 4.4% for Africans, 4.2% for Hispanics). Apart from being the most homophilous group, Europeans are also within the racial category that is the least excluded. Only 13% of all users would not be willing to date a European. In fact, almost all minority groups exclude contact with members sharing the same racial background to a higher extent than they exclude Europeans (for example, 38.9% of African members exclude the possibility of dating other Africans, but only 8.3% of them exclude Europeans). The unanimous pattern is that the most desirable racial group, after Europeans or their own, is represented by Hispanics. The least desirable groups are the African, Arabic and Asian ones. These initial descriptive results provide support for our second hypothesis, since the racial choices of non-European Internet daters form a patterned ranking that places European and same-race preferences on top, followed by a general openness towards the closest racial group to Europeans, represented by Hispanics. Aggregated measures of Hofstede's (2001) masculinity cultural dimension in European, Arabic, Hispanic, African, and Asian countries reveal that Hispanic nations have the most similar scores to the European ones. Europeans adhere to a similar pattern of excluding minorities, by being the least open towards Arabic and African groups, followed by Asian, and lastly, Hispanic members. The European online dating market for minority group members therefore resembles the marriage market in the U.S. by displaying a racial hierarchy or a 'caste system' of preferences (Fu 2001: 157).

In terms of the educational level of Internet daters, the highly educated are more prominent among the Asians (40.5%), Arabs (39.1%) and Africans (38.5%). The gender distribution is balanced only when it comes to European members. Women appear to be over-represented in the Hispanic and African groups, while men are more numerous among the Arabic and Asian groups. The mean age of online daters is 34.19 years old, with the youngest members among the Africans (mean age of 32.07) and Arabs (32.18). The distribution in terms of religious denominations varies across racial groups as well. Most European (47.2%), Hispanic (44.4%) or African (45.7%) users mention belonging to the Christian religion, with more than two thirds of the Arabic users specifying that they are Muslim, while Asian users seem to be the most heterogeneous. Little variation is observed in terms of previous relationship history, with 59.6% of all users mentioning not having been married before and 36.4% as being either divorced or separated. The largest proportion of Internet daters with at least one child living in the same residence is observed for the African racial group (33.5%).

We now turn to the descriptive statistics of contextual variables that are specific for minority groups (Table 2B). In terms of relative group sizes, 55.6% of Arabs belong to relatively large groups (i.e., between 2% to 5% shares of the total population at the regional level), while most of the other minority racial groups form smaller size regional communities (i.e., smaller than 2%). For all minority racial groups, the local sex ratios appear to be mostly unbalanced.

### *Multivariate results*

Tables 4A and 4B present the estimated coefficients and odds ratios in two multilevel logistic regression models for each of the six dependent variables. Model 1 tests the effect of both race and educational level on the occurrence of racial homophily and exclusion in partner preferences, while controlling for several individual-level factors. Model 2 adds the regional-level variables. Our first hypothesis proposed that European users display higher levels of racial homophily and exclusion compared to users belonging to racial minorities. The results in model 1 provide clear support for this expectation. Arabic, African, Asian, Hispanic, and other types of racial groups are significantly less likely to only prefer dating same-race partners and also less likely to exclude other minority racial groups. Adding contextual factors does not alter the

prominent effect of race on in-group partner preferences and exclusion of specific races. The second hypothesis was addressed in the previous section. Recall that in third hypothesis, we anticipated that the higher educated would have a lower level of racial homophily and exclusion compared to the lower educated. This theoretical expectation also is confirmed. The results of both Model 1 and 2 indicate that online daters with a medium or high level of education are significantly less likely to specify same-race partner preferences or to exclude specific racial groups. The effect of being highly educated is even more pronounced than the effect of having a medium level education. This suggests that climbing up the educational ladder attracts a proportional decrease in homophilous and restrictive tendencies in terms of race.

We now turn to presenting findings in relation to contextual factors (Tables 5A and 5B). The fourth hypothesis suggested that minority members belonging to larger groups would have higher levels of racial homophily and exclusion in partner preferences compared to minority-status members from smaller groups. We again find unanimous support for this expectation, since the larger the group, the more likely Internet daters are to prefer a same-race only partner, and to exclude Europeans, Hispanics, Arabs, Africans or Asians. For example, individuals living in areas where the size of their group falls between 2% and 5% of the population have a 153%  $((2.526 - 1) * 100)$  increase in the odds of preferring same-race partners, compared to regions where their own group is smaller than 1% of the population. Table 5B shows that members belonging to groups that have a size between 1% and 2% are more likely to exclude Arabs. Surprisingly, minority members living in areas where the size of their group is higher than 2% of the population appear to be less likely to exclude Arabs. However, a closer look at the data reveals that the majority of non-European members belonging to large groups (i.e., between 2% and 5%) are of Arabic origin, which helps to explain this finding.

The fifth hypothesis proposed that that skewed group-specific sex ratios are associated with lower levels of racial homophily and exclusion in partner preferences compared to balanced sex ratios. Findings show partial evidence in support of this proposition. Skewed sex ratios at the regional level significantly decrease homophily, as well as the exclusion of Hispanics and Africans. There are no significant effects with respect to the exclusion of Arabs or Asians. Contrary to our expectations, unbalanced local marriage markets actually increase the odds of excluding European members by 19.3%  $((1.193 - 1) * 100)$ . Additional analysis that includes

interaction terms of gender and skewed sex ratio and that also distinguishes between unbalanced sex ratios over-representing women and sex ratios over-representing men, reveals that this effect is mainly driven by female members living in regions that have an overrepresentation of men.

Hypothesis 6a and 6b suggested two opposing mechanisms for the effect of racial diversity on the levels of racial homophily and exclusion in partner preferences. We developed two competing hypotheses, arguing that individuals living in racially diverse regions would demonstrate either lower (6a) or higher (6b) levels of racial homophily and exclusion. The results are mixed, with more support for hypothesis 6a. The higher the level of racial diversity in the local environment, the lower the odds of racial homophily or exclusion of Europeans, Hispanics or Asians in partner preferences. There are, however, no significant effects with respect to the exclusion of Arabs or Africans.

In the last hypothesis we anticipated that attitudinal factors played a role in shaping partner racial preferences. More specifically, we argued that users living in regions with strong anti-immigrant attitudes have higher levels of racial homophily and exclusion. We found that the more pronounced the anti-immigrant attitudes at the regional level, the more likely Internet daters are to exclude all minority racial groups. The effect does not hold for racial homophily and exclusion of Europeans.

To summarize, all hypotheses proposed at the regional level receive nearly full support from the data, indicating that even though contextual factors do not have a clear-cut effect on racial preferences, they continue to influence the way individuals choose partners in online dating. Table 6 provides an overview of the main effects of both individual- and regional-level factors with respect to all six outcome variables. Overall, the individual- and contextual-level variables explained a great deal of the cross-region variation of homophily and exclusion. For instance, the unexplained variance of homophily for the full sample decreased by 49.6% when all variables were added, while the variance of excluding Arabs for the minorities' sample decreased by 53% compared to the empty model.



## DISCUSSION

Using online dating profile information, we tested whether a selection of both individual and contextual characteristics influences levels of racial homophily and exclusion of specific racial groups in online dating preferences across 59 regions in 9 European countries. At the individual level, our analyses confirmed results of earlier studies. We found that an individual's own racial background and education had a major influence on the choices that Internet daters specify in terms of preferred races of potential partners. Across all contexts, minority members are less likely to prefer same-race partners only or to exclude other minority racial groups, compared to the European majority, which is consistent with the predictions of social dominance theory. Moreover, exclusion patterns reveal the existence of a definite hierarchy of racial preferences, which places Europeans and one's own group on top, Hispanics on an intermediate position, while Arabs, Africans, and Asians are at the bottom of the ranking. Our findings show that partner preferences in online dating continue to be racially determined to a large extent despite common expectations that Internet dating might help to reduce ethnic and racial divisions in intimate relationships due to the benefits of a large mating market and the lessening of social pressures. Social distances are particularly perpetuated by Europeans, but also by racial minority groups, which in the need to distinguish themselves from similarly low-ranked groups paradoxically concede a biased hierarchy of out-groups. Education also proves to be a robust predictor of racial preferences, with consistent effects along all outcome variables. The highly educated are continuously more open to dating racially diverse partners.

When considering broader societal-level contextual factors, we found that racial diversity, race-specific group size and sex ratio, and negative attitudes towards immigrants influence Internet daters' selection criteria in terms of race. Alongside the individual characteristics of the daters themselves, the characteristics of the local marriage market continue to play a considerable role in shaping homophilous preferences and restrictive tendencies towards specific racial groups. The results support our proposition that the structural configuration of the individual's resident environment influences the anticipation of opportunities for contact in the online world and, through that, the willingness to interracially date. Therefore, Blau's theory of structurally determined interpersonal choices reverberates in online dating as well, regardless of the possibility of daters to express preferences that can go

beyond one's resident context. Minority members that live in regions where their own racial group is large enough in size can expect more opportunities for in-group contact. Therefore they are more inclined to express same-race preferences, as well as unwillingness to date members of other (either majority or minority) racial groups.

Although less prominent, the effect of unbalanced sex ratios reveals that minority members appear to take into account the lower chances of getting in contact with opposite-sex persons having the same racial background and therefore relax their selection criteria. Skewed marriage markets relate to a decrease in homophily and the exclusion of Hispanics and Africans. Racial heterogeneity at the regional level operates according to contact theory. Highly diverse regions are associated with lower levels of homophily and exclusion of certain racial groups, indicating that geographical proximity and familiarity with out-groups play a considerable role in reducing racial divides in personal relationships. Finally, the general attitudinal climate towards out-groups (represented by immigrants) likewise plays a considerable role in determining racial partnering choices. Negative attitudes towards immigrants at the regional level is related to a higher level of restrictive tendencies towards all minority racial groups, demonstrating that normative orientations still govern the online environment despite the absence of significant others that might condemn deviations from the norm.

Even though this study was able to examine the individual and contextual level effects on racial preferences for partners across multiple regions in 9 countries and go beyond existing research in several ways, it also has some limitations. First, we were unable to use information on the country of origin, or of the generation of immigration or family background of the individuals. Second, we also recognize that more refined racial categories (beyond European for instance) would be more desirable. Third, the census data based on which our racial composition measures were built are slightly outdated. Nevertheless, our analyses still manage to reveal a sizeable influence of structural factors on interracial online dating. Further research could supplement this analysis with more fine-grained information about specific regional contexts, integrating information from the local or community levels.

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**TABLE 1.** Foreign-born population statistics

	Foreign-born population (2011)	High educational attainment (2008)		Employment rate (2009)		People at risk of poverty or social exclusion (2010)	
		Native-born	Foreign-born	Native-born	Foreign-born	Native-born	Foreign-born
Austria	15.5	15.3	16.8	73.1	64.7	13.3	29.3
Germany	12	22.2	18.4	71.9	62.4	19.1	22.4
Switzerland	24.7	27.8	30.4	80.3	75.7	14.8	20.5
The Netherlands	11.2	27.8	24.8	78.6	66.6	12.8	26.3
France	11.2	25.1	22.8	64.9	57.8	16.9	29.5
Sweden	14.7	26.2	28.5	74.2	62.2	13.3	27.5
Spain	14.2	28.4	20.7	60.1	58.0	23.7	36.1
Italy	8.8	12.8	11.0	56.9	62.8	22.8	33.2
Poland	1.4	16.4	29.8	59.4	45.5	27.3	27.5

Source: Eurostat

**TABLE 2A.** Descriptive statistics for variables used in analysis of racial homophily and exclusion, by race ( $N = 100,817$  users, 59 regions)

	European	Hispanic	Arabic	African	Asian	Other	Total
<b>Dependent variables</b>							
Racial homophily	56.6	4.2	19.3	4.4	5.3	23.1	26.0
Excludes European	0.9	6.9	23.5	8.3	13.0	25.7	13.0
Excludes Hispanic	61.9	31.5	51.1	49.7	48.2	48.5	50.2
Excludes Arabic	69.5	62.2	16.1	54.4	57.7	52.8	55.1
Excludes African	68.6	64.3	55.8	38.9	61.3	54.3	58.8
Excludes Asian	64.1	58.2	52.9	51.4	33.6	50.3	54.3
<b>Individual-level independent variables</b>							
<b>Race</b>							
European							28
Arabic							14.1
African							11.6
Asian							10.4
Hispanic							8.2
Other							27.8
<b>Educational level</b>							
Low	12.0	9.2	17.0	18.6	16.5	25.7	17.1
Medium	54.8	55.5	44.0	42.9	43.0	48.6	49.7
High	33.2	35.3	39.1	38.5	40.5	25.7	33.2
<b>Individual-level control variables</b>							
<b>Sex</b>							
Men	50.3	36.9	55.5	47.1	52.8	43.3	46.9
Women	49.7	63.1	44.5	52.9	47.2	56.7	53.1
<b>Religion</b>							
Christian	47.2	44.4	3.3	45.7	22.2	37.0	36.7
Muslim	0.5	0.6	69.8	23.3	14.9	6.9	13.9
Buddhist	0.4	0.8	0.6	0.9	9.9	0.8	1.4
Atheist	24.9	12.5	8.7	6.8	20.0	18.3	17.1
Non-religious believer	23.1	35.9	13.1	15.9	21.2	19.8	21.9
Other	4.0	5.9	4.4	7.4	11.8	17.4	9.0
<b>Marital status</b>							
Never married	57.9	54.1	61.5	68.3	58.6	60.4	59.6
Divorced	22.9	19.9	20.4	14.0	23.0	19.9	20.4
Separated	14.8	22.4	15.5	15.1	13.6	15.1	16.0
Widowed	4.3	3.6	2.6	2.7	4.7	4.6	4.0
<b>Resident children</b>							
No children	74.7	71.7	73.6	66.5	73.9	68.0	71.4
One child	15.4	18.2	12.4	17.0	13.5	17.4	16.0
Two children	7.8	7.9	9.3	10.8	8.5	9.9	8.9



	2.2	2.2	4.7	5.7	4.1	4.7	3.7
Membership							
Non-premium	90.9	96.4	98.0	95.6	95.1	95.7	94.7
Premium	9.1	3.6	2.0	4.4	4.9	4.3	5.3
Age (range: 18-95)	Mean	S.d.	Mean	S.d.	Mean	S.d.	Mean
Importance race (range: 1-7)	35.93	12.32	32.18	9.38	34.14	11.26	34.19
Self-described attractiveness (range: 1-7)	3.72	1.69	3.42	1.73	3.66	1.58	3.58
	4.89	1.29	4.63	1.54	4.75	1.51	4.84
<b>Contextual-level independent variables</b>							
Racial diversity - centered (range: -0.1-0.3)							Mean
Anti-immigrant attitudes - centered (range: -1.2-1.4)							S.d.
<b>Total N</b>	<b>28,218</b>	<b>14,223</b>	<b>11,704</b>	<b>10,449</b>	<b>8,225</b>	<b>27,998</b>	<b>100,817</b>

Notes: SD = standard deviation.

Source: Database of heterosexual members of a European dating site, September 2011.

**TABLE 2B.** Descriptive statistics for minority-specific contextual variables used in analysis of racial homophily and exclusion, by race ( $N = 72,599$  minority users, 59 regions)

	Hispanic	Arabic	African	Asian	Other	Total
<b>Contextual-level independent variables</b>						
Relative group size						
<1.0	45.0	18.5	66.0	80.0	8.2	6.2
1.0 to 1.9	35.8	25.9	34.0	20.0	0.7	21.2
2.0 to 5.0	19.2	55.6	0.0	0.0	11.0	17.0
Group-specific sex ratio						
Balanced	9.3	0.0	8.9	20.4	2.7	15.7
Skewed	90.7	100.0	91.1	79.6	73.4	84.3
<b>Total N</b>	<b>14,223</b>	<b>11,704</b>	<b>10,449</b>	<b>8,225</b>	<b>27,998</b>	<b>72,599</b>

Notes: SD = standard deviation.

Source: Database of heterosexual members of non-European racial background enrolled in a European dating site, September 2011.

**TABLE 3A.** Estimates for the empty models ( $N = 100,817$  users, 59 regions)

	<i>Homophily</i>		<i>Exclude European</i>		<i>Exclude Hispanic</i>		<i>Exclude Arabic</i>		<i>Exclude African</i>		<i>Exclude Asian</i>	
<b>Fixed effect</b>	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.
Intercept	-0.904	0.068	-1.889	0.063	0.052	0.034	0.302	0.039	0.399	0.030	0.171	0.035
<b>Random Effect</b>	Variance	S.E.	Variance	S.E.	Variance	S.E.	Variance	S.E.	Variance	S.E.	Variance	S.E.
<i>Regional-level variance:</i>												
$\tau_0^2 = \text{var}(U_0)$	0.258	0.050	0.214	0.042	0.060	0.012	0.079	0.016	0.046	0.010	0.065	0.013

*Source:* Database of heterosexual members of a European dating site, September 2011.

**TABLE 3B.** Estimates for the empty models ( $N = 72,599$  minority users, 59 regions)

	<i>Homophily</i>		<i>Exclude European</i>		<i>Exclude Hispanic</i>		<i>Exclude Arabic</i>		<i>Exclude African</i>		<i>Exclude Asian</i>	
<b>Fixed effect</b>	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.
Intercept	-1.640	0.088	-1.355	0.090	-0.145	0.033	0.069	0.043	0.214	0.034	-0.015	0.040
<b>Random Effect</b>	Variance	S.E.	Variance	S.E.	Variance	S.E.	Variance	S.E.	Variance	S.E.	Variance	S.E.
<i>Regional-level variance:</i>												
$\tau_0^2 = \text{var}(U_0)$	0.429	0.084	0.448	0.087	0.052	0.011	0.098	0.020	0.055	0.012	0.081	0.017

*Source:* Database of heterosexual members of non-European racial background enrolled in a European dating site, September 2011.

**TABLE 4A.** Multilevel analysis of individual- and contextual-level effects on racial homophily, exclusion of Europeans, and exclusion of Hispanics ( $N = 100,817$  users, 59 regions)

	<i>Racial homophily</i>						<i>Exclude European</i>						<i>Exclude Hispanic</i>					
	<b>Model 1</b>		<b>Model 2</b>		<b>Model 1</b>		<b>Model 2</b>		<b>Model 1</b>		<b>Model 2</b>		<b>Model 1</b>		<b>Model 2</b>			
	$b$ (SE)	$e^b$	$b$ (SE)	$e^b$	$b$ (SE)	$e^b$	$b$ (SE)	$e^b$	$b$ (SE)	$e^b$	$b$ (SE)	$e^b$	$b$ (SE)	$e^b$	$b$ (SE)	$e^b$		
<b>Intercept</b>	-1.085 (0.077)	0.338***	-1.122 (0.073)	0.325***	-5.514 (0.116)	0.004***	-5.558 (0.113)	0.004***	-1.551 (0.060)	-1.551 (0.060)	0.212***	-1.583 (0.058)	0.205***					
<b>Individual-level factors</b>																		
Race: European																		
Hispanic	-3.714 (0.049)	0.024***	-3.715 (0.049)	0.024***	2.451 (0.076)	11.596***	2.452 (0.076)	11.617***	-1.626 (0.029)	-1.626 (0.029)	0.197***	-1.627 (0.029)	0.197***					
Arabic	-1.948 (0.043)	0.143***	-1.949 (0.043)	0.142***	3.667 (0.074)	39.140***	3.669 (0.074)	39.214***	-0.407 (0.033)	-0.407 (0.033)	0.665***	-0.408 (0.033)	0.665***					
African	-3.513 (0.054)	0.030***	-3.515 (0.054)	0.030***	2.660 (0.076)	14.292***	2.663 (0.076)	14.344***	-0.475 (0.029)	-0.475 (0.029)	0.622***	-0.476 (0.029)	0.621***					
Asian	-3.228 (0.054)	0.040***	-3.229 (0.055)	0.040***	3.157 (0.074)	23.504***	3.160 (0.074)	23.561***	-0.424 (0.030)	-0.424 (0.030)	0.654***	-0.424 (0.030)	0.654***					
Other	-1.702 (0.023)	0.182***	-1.703 (0.023)	0.182***	3.802 (0.065)	44.775***	3.804 (0.066)	44.887***	-0.609 (0.020)	-0.609 (0.020)	0.544***	-0.609 (0.020)	0.544***					
Educational level: Low																		
Medium	-0.417 (0.025)	0.659***	-0.416 (0.025)	0.659***	-0.486 (0.026)	0.615***	-0.485 (0.026)	0.616***	-0.298 (0.021)	-0.298 (0.021)	0.742***	-0.296 (0.021)	0.744***					
High	-0.819 (0.028)	0.441***	-0.818 (0.028)	0.442***	-0.921 (0.032)	0.398***	-0.919 (0.032)	0.399***	-0.598 (0.023)	-0.598 (0.023)	0.550***	-0.597 (0.023)	0.551***					
<b>Contextual-level factors</b>																		
Racial diversity																		
Anti-immigrant attitudes																		
<b>Contextual-level variance:</b>																		
$\tau_0^2 = \text{var}(U_{0j})$	0.168 (0.033)	0.130 (0.026)	0.130 (0.026)	0.328 (0.065)	0.276 (0.055)	0.086 (0.018)	0.086 (0.018)	0.122***	-0.789 (0.386)	-0.789 (0.386)	0.454**	0.454**	0.454**					
Anti-immigrant attitudes																		
<b>Contextual-level variance:</b>																		
$\tau_0^2 = \text{var}(U_{0j})$																		

*Notes:* Standard errors are in parentheses. Significance: \*\*\* p<0.01; \*\* p<0.05; \* p<0.1. The models controls for the following characteristics of users: sex, age, religion, marital status, number of resident children, self-described attractiveness, as well as for the importance awarded to match's race.  
*Source:* As for Table 3A.

**TABLE 4B.** Multilevel analysis of individual- and contextual-level effects on exclusion of Arabs, exclusion of Africans, and exclusion of Asians ( $N = 100,817$  users, 59 regions)

	Exclude Arabic			Exclude African			Exclude Asian			
	Model 1		Model 2	Model 1		Model 2	Model 1		Model 2	
	$b$ (SE)	$e^b$ (SE)	$b$ (SE)	$e^b$ (SE)	$b$ (SE)	$e^b$ (SE)	$b$ (SE)	$e^b$ (SE)	$b$ (SE)	
<b>Intercept</b>	-1.163 (0.056)	0.313*** (0.054)	-1.188 (0.054)	0.305*** (0.056)	-1.425 (0.056)	0.241*** (0.054)	-1.450 (0.054)	0.235*** (0.060)	-1.685 (0.058)	0.191*** (0.058)
<b>Individual-level factors</b>										
Race: European										
Hispanic	-0.594 (0.029)	0.552*** (0.029)	-0.592 (0.029)	0.553*** (0.029)	-0.436 (0.029)	0.646*** (0.029)	-0.435 (0.029)	0.648*** (0.029)	-0.527 (0.029)	0.590*** (0.029)
Arabic	-2.226 (0.038)	0.108*** (0.038)	-2.228 (0.038)	0.108*** (0.038)	-0.378 (0.033)	0.685*** (0.033)	-0.378 (0.033)	0.685*** (0.033)	-0.325 (0.033)	0.723*** (0.033)
African	-0.424 (0.030)	0.654*** (0.030)	-0.425 (0.030)	0.654*** (0.030)	-1.398 (0.030)	0.247*** (0.030)	-1.400 (0.030)	0.247*** (0.030)	-0.512 (0.030)	0.600*** (0.030)
Asian	-0.295 (0.031)	0.744*** (0.031)	-0.295 (0.031)	0.745*** (0.031)	-0.187 (0.031)	0.830*** (0.031)	-0.187 (0.031)	0.830*** (0.031)	-1.319 (0.032)	0.268*** (0.032)
Other	-0.739 (0.021)	0.477*** (0.021)	-0.739 (0.021)	0.477*** (0.021)	-0.656 (0.021)	0.519*** (0.021)	-0.656 (0.021)	0.519*** (0.021)	-0.650 (0.021)	0.522*** (0.021)
Educational level: Low										
Medium	-0.245 (0.022)	0.783*** (0.022)	-0.243 (0.022)	0.784*** (0.022)	-0.191 (0.021)	0.826*** (0.021)	-0.189 (0.021)	0.828*** (0.021)	-0.274 (0.021)	0.759*** (0.021)
High	-0.482 (0.024)	0.618*** (0.024)	-0.479 (0.024)	0.619*** (0.024)	-0.369 (0.023)	0.692*** (0.023)	-0.366 (0.023)	0.693*** (0.023)	-0.510 (0.023)	0.601*** (0.023)
<b>Contextual-level factors</b>										
Racial diversity			-0.436 (0.295)	0.647 (0.008)			-0.355 (0.301)	0.701 (0.008)		-0.793 (0.377)
Anti-immigrant attitudes			0.151 (0.048)	1.163*** (0.048)			0.160 (0.049)	1.174*** (0.049)		0.143 (0.061)
<i>Contextual-level variance:</i>										
$\tau_0^2 = \text{var}(U_{0i})$	0.049 (0.011)	0.036 (0.008)	0.052 (0.011)	0.038 (0.008)	0.081 (0.017)	0.062 (0.013)	0.081 (0.017)	0.062 (0.013)	0.062 (0.013)	0.062 (0.013)

*Notes:* Standard errors are in parentheses. Significance: \*\*\*  $p < 0.01$ ; \*\*  $p < 0.05$ ; \*  $p < 0.1$ . The models control for the following characteristics of users: sex, age, religion, marital status, number of resident children, self-described attractiveness, as well as for the importance awarded to match's race.  
*Source:* As for Table 3A.

**TABLE 5A.** Multilevel analysis of individual- and contextual-level effects on racial homophily, exclusion of Europeans, and exclusion of Hispanics ( $N = 72,599$  minority users, 59 regions)

	Racial homophily				Exclude European				Exclude Hispanic			
	Model 1		Model 2		Model 1		Model 2		Model 1		Model 2	
	$b$ (SE)	$e^b$ (SE)	$b$ (SE)	$e^b$ (SE)	$b$ (SE)	$e^b$ (SE)	$b$ (SE)	$e^b$ (SE)	$b$ (SE)	$e^b$ (SE)	$b$ (SE)	$e^b$ (SE)
<b>Intercept</b>	-3.808 (0.107)	0.022*** (0.111)	-4.106 (0.111)	0.016*** (0.111)	-3.089 (0.106)	0.046*** (0.113)	-3.347 (0.113)	0.035*** (0.069)	-2.965 (0.069)	0.052*** (0.072)	-3.002 (0.072)	0.050*** (0.072)
<b>Individual-level factors</b>	Ref.											
Race: Hispanic	Ref.											
Arabic	1.591 (0.063)	4.909*** (0.069)	1.403 (0.069)	4.068*** (0.069)	1.236 (0.054)	3.443*** (0.057)	1.116 (0.057)	3.053*** (0.039)	1.194 (0.039)	3.299*** (0.039)	1.145 (0.042)	3.143*** (0.042)
African	0.105 (0.071)	1.111 (0.075)	0.382 (0.075)	1.465*** (0.075)	0.219 (0.057)	1.244*** (0.057)	0.279 (0.058)	1.321*** (0.036)	1.134 (0.036)	3.107*** (0.037)	1.173 (0.037)	3.232*** (0.037)
Asian	0.370 (0.073)	1.448*** (0.077)	0.672 (0.077)	1.958*** (0.077)	0.717 (0.056)	2.049*** (0.056)	0.797 (0.058)	2.220*** (0.038)	1.188 (0.038)	3.281*** (0.039)	1.220 (0.039)	3.387*** (0.039)
Other	1.787 (0.053)	5.973*** (0.060)	2.079 (0.060)	7.995*** (0.060)	1.347 (0.044)	3.845*** (0.044)	1.405 (0.047)	4.074*** (0.032)	1.011 (0.030)	2.748*** (0.030)	1.066 (0.032)	2.903*** (0.032)
Educational level: Low	Ref.											
Medium	-0.472 (0.029)	0.624*** (0.029)	-0.494 (0.029)	0.610*** (0.029)	-0.488 (0.027)	0.614*** (0.027)	-0.489 (0.027)	0.613*** (0.023)	-0.301 (0.023)	0.740*** (0.023)	-0.305 (0.023)	0.737*** (0.023)
High	-0.959 (0.036)	0.383*** (0.036)	-0.958 (0.036)	0.384*** (0.036)	-0.920 (0.032)	0.398*** (0.032)	-0.915 (0.032)	0.400*** (0.025)	-0.567 (0.025)	0.567*** (0.025)	-0.564 (0.025)	0.569*** (0.025)
<b>Contextual-level factors</b>	Ref.											
Racial diversity	-2.921 (0.515)	0.054*** (0.515)	-2.921 (0.515)	0.054*** (0.515)	-2.415 (0.783)	0.089*** (0.783)	-2.415 (0.783)	0.089*** (0.783)	-2.415 (0.783)	0.089*** (0.783)	-2.415 (0.783)	0.089*** (0.783)
Anti-immigrant attitudes	0.055 (0.083)	1.056 (0.083)	0.055 (0.083)	1.056 (0.083)	0.038 (0.125)	1.038 (0.125)	0.038 (0.125)	1.038 (0.125)	0.038 (0.125)	1.038 (0.125)	0.167 (0.056)	1.182*** (0.056)
Relative group size: <1.0	Ref.											
1.0 to 1.9	0.481 (0.049)	1.618*** (0.049)	0.481 (0.049)	1.618*** (0.049)	0.036 (0.041)	1.037 (0.041)	0.036 (0.041)	1.037 (0.041)	0.036 (0.041)	1.037 (0.041)	0.158 (0.029)	1.171*** (0.029)
2.0 to 5.0	0.927 (0.058)	2.526*** (0.058)	0.927 (0.058)	2.526*** (0.058)	0.318 (0.049)	1.374*** (0.049)	0.318 (0.049)	1.374*** (0.049)	0.318 (0.049)	1.374*** (0.049)	0.194 (0.039)	1.214*** (0.039)
Group-specific sex ratio: balanced	Ref.											
Skewed	-0.116 (0.054)	0.891** (0.054)	-0.116 (0.054)	0.891** (0.054)	0.176 (0.045)	1.193*** (0.045)	0.176 (0.045)	1.193*** (0.045)	0.176 (0.045)	1.193*** (0.045)	-0.074 (0.033)	0.928** (0.033)
<b>Contextual-level variance:</b>	Ref.											
$\tau_0^2 = \text{var}(U_{0j})$	0.265 (0.054)	0.109 (0.024)	0.265 (0.054)	0.109 (0.024)	0.342 (0.068)	0.279 (0.056)	0.342 (0.068)	0.279 (0.056)	0.342 (0.068)	0.081 (0.017)	0.048 (0.011)	0.048 (0.011)

Notes: Standard errors are in parentheses. Significance: \*\*\* p<0.01; \*\* p<0.05; \* p<0.1. The models controls for the following characteristics of users: sex, age, religion, marital status, number of resident children, self-described attractiveness, as well as for the importance awarded to match's race.  
Source: As for Table 3B.

**TABLE 5B.** Multilevel analysis of individual- and contextual-level effects on exclusion of Arabs, exclusion of Africans, and exclusion of Asians ( $N = 72,599$  minority users, 59 regions)

	Exclude Arabic			Exclude African			Exclude Asian					
	Model 1		Model 2	Model 1		Model 2	Model 1		Model 2			
	$b$ (SE)	$e^b$ (SE)	$b$ (SE)	$e^b$ (SE)	$b$ (SE)	$e^b$ (SE)	$b$ (SE)	$e^b$ (SE)	$b$ (SE)			
<b>Intercept</b>	-1.489 (0.065)	0.226*** (0.072)	-1.479 (0.072)	0.228***	-1.682 (0.064)	0.186***	-1.616 (0.070)	0.199***	-1.987 (0.067)	0.137***	-2.100 (0.073)	0.122***
<b>Individual-level factors</b>												
Race: Hispanic												
Arabic	-1.543 (0.042)	0.214*** (0.046)	-1.478 (0.046)	0.228***	0.081 (0.038)	1.084**	0.032 (0.041)	1.032	0.210 (0.038)	1.233***	0.113 (0.041)	1.120***
African	0.187 (0.035)	1.206*** (0.036)	0.163 (0.036)	1.178***	-0.894 (0.035)	0.409***	-0.869 (0.036)	0.419***	0.037 (0.035)	1.038	0.070 (0.035)	1.072**
Asian	0.312 (0.037)	1.367*** (0.038)	0.292 (0.038)	1.339***	0.266 (0.037)	1.304***	0.271 (0.038)	1.311***	-0.749 (0.038)	0.473***	-0.711 (0.038)	0.491***
Other	-0.119 (0.029)	0.888*** (0.031)	-0.112 (0.031)	0.894***	-0.179 (0.029)	0.837***	-0.177 (0.031)	0.837***	-0.085 (0.029)	0.919***	-0.052 (0.031)	0.950*
Educational level: Low												
Medium	-0.258 (0.024)	0.772*** (0.024)	-0.256 (0.024)	0.774***	-0.194 (0.024)	0.824***	-0.197 (0.024)	0.821***	-0.271 (0.024)	0.762***	-0.273 (0.024)	0.761***
High	-0.455 (0.027)	0.635*** (0.027)	-0.453 (0.027)	0.636***	-0.322 (0.026)	0.725***	-0.320 (0.026)	0.726***	-0.472 (0.026)	0.624***	-0.468 (0.026)	0.626***
<b>Contextual-level factors</b>												
Racial diversity												
Anti-immigrant attitudes												
Relative group size: <1.0												
1.0 to 1.9												
2.0 to 5.0												
Group-specific sex ratio: balanced												
Skewed												
Contextual-level variance:												
$\tau_0^2 = \text{var}(U_{0j})$	0.055 (0.012)	0.046 (0.011)	0.053 (0.012)	0.035 (0.008)	0.078 (0.017)	0.055 (0.012)	0.035 (0.008)	0.078 (0.017)	0.055 (0.012)	0.055 (0.012)	0.055 (0.012)	0.055 (0.012)

Notes: Standard errors are in parentheses. Significance: \*\*\*  $p < 0.01$ ; \*\*  $p < 0.05$ ; \*  $p < 0.1$ . The models controls for the following characteristics of users: sex, age, religion, marital status, number of resident children, self-described attractiveness, as well as for the importance awarded to match's race.

Source: As for Table 3B.

**TABLE 6.** Summary of main effects

	<i>Homophily</i>	<i>Exclude European</i>	<i>Exclude Hispanic</i>	<i>Exclude Arabic</i>	<i>Exclude African</i>	<i>Exclude Asian</i>
<b>Individual-level factors</b>						
Race	Compared to Europeans, all minority racial groups are significantly less likely to have homophilous preferences or to exclude other minorities. Among minority racial groups, Arab users are the most likely to have homophilous preferences.					
Educational level	Compared to the lower educated, the medium and the higher educated are significantly less likely to have homophilous preferences or to exclude other racial groups.					
<b>Contextual-level factors</b>						
Relative group size	The larger the group, the more likely to be homophilous.	The larger the group, the more likely to exclude Europeans.	The larger the group, the more likely to exclude Hispanics.	The larger the group, the more likely to exclude Arabs. However, the effect works in reverse for groups larger than 2.0.	The larger the group, the more likely to exclude Africans.	The larger the group, the more likely to exclude Asians.
Group-specific sex ratio	Skewed marriage markets decrease homophily.	Skewed marriage markets increase the exclusion of Europeans.	Skewed marriage markets decrease the exclusion of Hispanics.	No significant effect.	Skewed marriage markets decrease the exclusion of Africans.	No significant effect.
Racial diversity	The more diversity, the less homophily.	The more diversity, the less exclusion of Europeans.	The more diversity, the less exclusion of Hispanics.	No significant effect.	No significant effect.	The more diversity, the less exclusion of Asians.
Anti-immigrant attitudes	No significant effect.	No significant effect.	The stronger the attitudes, the more exclusion of Hispanics.	The stronger the attitudes, the more exclusion of Arabs.	The stronger the attitudes, the more exclusion of Africans.	The stronger the attitudes, the more exclusion of Asians.