

# Muslims in France: identifying a discriminatory equilibrium

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**Abstract** We analyze the assimilation patterns of Muslim immigrants in Western countries with a unique identification strategy. Survey and experimental data collected in France in 2009 suggest that Muslims and rooted French are locked in a suboptimal equilibrium whereby (i) rooted French exhibit taste-based discrimination against those they are able to identify as Muslims and (ii) Muslims perceive French institutions as systematically discriminatory against them. This equilibrium is sustained because Muslims, perceiving discrimination as institutionalized, are reluctant to assimilate and rooted French, who are able to identify Muslims as such due to their lower assimilation, reveal their distaste for Muslims.

**Keywords** Assimilation · Muslim and Christian immigrants · Discrimination · France

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## 1 Introduction

Debate rages in European societies as to whether Muslim immigrants can ever integrate (Caldwell 2009). The Islamicist-inspired bombings in Spain (2004) and London (2005), the murder of Theo van Gogh in the Netherlands in 2004 for his depiction of Muslim sexuality, and the riots in heavily Muslim ghettos of Paris (2005) and Stockholm (2013) all contribute to portray Muslims as posing a threat to Europe. One element of this threat is cultural, raising the question of whether Muslim immigrants and their descendants will assimilate into a common European culture. We therefore ask whether Muslims qua Muslims in Europe indeed show lower assimilation<sup>1</sup> and, if so, what are the forces that sustain this deficit? These questions carry important implications for social cohesion in Europe.

Evidence about the assimilation patterns of Muslim immigrants in Western countries is mixed. Using the UK Fourth National Survey of Ethnic Minorities, Bisin et al. (2008, 2011a) find that attachment to the culture of origin is higher for Muslims than for non-Muslims. For non-Muslims, this attachment attenuates with time spent in the UK; but for Muslims, attachment is unrelated to time (see Dustmann (1996), Shields and Price (2002), Riphahn (2003), and van Ours and Veenman (2003) for similar conclusions). Yet, these results are at odds with those of Manning and Roy (2010) who, using the UK Labour Force Survey in 2001, analyze respondents' probability of answering "British" when asked to define their identity. They show that newly arrived immigrants almost never think of themselves as British and that no difference exists between Muslims and non-Muslims. Moreover, they find that the probability of reporting a British identity increases with the time spent in the UK, at a similar rate for Muslims and for non-Muslims (see Constant et al. (2009), Aleksynska (2011), and Georgiadis and Manning (2011) for similar results showing no Muslim effect).

These mixed results may partly derive from the difficulty of isolating a religion (Islam) effect on assimilation patterns, due to possible confounds such as race, ethnicity, or nationality. Indeed, Muslim immigrants typically migrate from *Muslim* countries, i.e., countries with few non-Muslim counterparts. This is the case, for example, of North-African immigrants in France, Turkish immigrants in Germany, and Pakistani and Bangladeshi immigrants in the UK. These confounds make it difficult to obtain a clean comparison for any European state, holding constant the country of origin, between the assimilation patterns of Muslim and non-Muslim immigrants.

The objective of this paper is twofold. First, we want to compare the assimilation patterns, on average and over time, of Muslim and non-Muslim immigrants without running into identification problems. We focus on France, which is home to the largest Muslim community in Western Europe both in absolute numbers (an estimated 4.7 million in 2010) and as a percentage of its population (an estimated 7.5 % in 2010) according to the Pew Research Center Report (2011). To isolate a Muslim effect, we cannot study the principal Muslim immigrant group in France, viz. North

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<sup>1</sup>Following Constant et al. (2009) or Gorinas (2014), we measure the degree of assimilation by the level of identification with ancestral homeland and with the host country.

Africans, as there is no matched set of North-African Christians to whom North-African Muslims could be compared. We focus instead on two ethnolinguistic groups originating in Senegal, the Joolas and the Serers. These ethnolinguistic groups are divided by religion, with one portion of them being Muslim and another portion being Christian. With the exception of religion, Senegalese Muslims (hereafter SM) and Senegalese Christians (hereafter SX) from these two ethnolinguistic groups are similar. They share the same culture and migrated to France at the same time (in the early 1970s), due to the same push factor (extensive drought conditions). Appendix 1 develops evidence that families from the Joola and Serer communities who converted to Christianity in the nineteenth century were not different from those who converted to Islam during the same period. Moreover, it shows that SM and SX individuals who were the first to migrate to France after WWII were similar across key characteristics: level of education and occupation in Senegal as well as time of arrival to France.

To compare the assimilation patterns, on average and over time, of SM and SX, we rely on a survey that we conducted in 2009 among a set of second- and third-generation immigrants to France stemming from these two groups. Our results reveal that Muslim immigrants show significantly lower assimilation (i.e., higher attachment to their culture of origin and lower identification with the host culture and society) than do their Christian counterparts. Furthermore, we find that assimilation levels between SM and SX do not converge over the time elapsed since the arrival of the first migrant to France.<sup>2</sup>

What accounts for these results? Understanding the mechanism(s) behind the persistence of Muslims' lower assimilation in France constitutes the second objective of this paper. To do so, we rely on a field experiment<sup>3</sup> we conducted in France in 2009. This experiment involves behavioral games that bring together SM and SX players with rooted French players (i.e., those citizens with four grandparents born inside metropolitan France) whom we refer to as FFF (i.e., French for at least three generations). Our games are designed to illuminate how SM and FFF behave toward each other when unconditional altruism and trust (i.e., belief about others' unconditional altruism) are at stake (as compared to the way SX and FFF behave toward each other). Our experiment reveals that SM are less cooperative (they show lower unconditional altruism and trust)—notably with rooted French players—than are SX, a result that is consistent with our survey finding that SM have assimilated less in France than have SX. Moreover, our games show that the persistence of Muslims' lower assimilation is consistent with Muslims and rooted French being locked in a suboptimal equilibrium whereby (i) rooted French exhibit taste-based discrimination, that is, they show lower unconditional altruism (but not lower trust), toward those they are able to identify

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<sup>2</sup>For three of the 18 items measuring assimilation, we even find that these patterns diverge: SM lower assimilation decreases, while SX higher assimilation increases with the time spent in France.

<sup>3</sup>Technically, and relying on the taxonomy created by Harrison and List (2004), we have conducted a “framed field experiment” since, as we shall describe, we rely on a nonstandard subject pool, and these subjects receive an information set from the real world (the names of their game partners) that they can use in their game participation. We also ran a follow-up experiment in 2010 that also relied on a nonstandard subject pool that received an information set from the real world. Henceforth, for economy of expression, we refer to both interventions as “field experiments.”

as Muslims (due to the fact that these Muslims maintain recognizable Muslim first names); (ii) Muslims perceive French institutions as systematically discriminatory against them (and therefore assimilate less, although Muslims' lower assimilation may not only be due to rooted French discrimination).

Our findings are consistent with research in identity economics showing that if the cost of assimilation is sufficiently high (possibly due to taste-based discrimination by the dominant group), it becomes rational for members of the minority to eschew assimilation (see Laitin (1995), Akerlof and Kranton (2000), Fang and Loury (2005), and Bisin et al. (2011c)). Consistent with these findings is the evidence on assimilation behavior after an exogenous shock to everyday relations. For example, after the 9/11 attacks in the USA, hostility toward Muslims by non-Muslim Americans increased, and—relatedly—Muslim identification with the USA decreased (Davila and Mora (2005) and Gould and Klor (2012)). Note that taste-based discrimination by the dominant group could induce the adoption by the minority of an in-group norm of punishment of assimilators that further increases the cost of assimilation. In racial relations in the USA, in-group policing in which initial assimilators are subject to the epithet of “acting white” deters other African Americans from assimilating (see Fryer and Torelli (2010) for empirical evidence of this phenomenon and Fordham and Ogbu 1986, Fordham (1996), McWhorter (2000), Austen-Smith and Fryer (2005), and Eguia (2012) for its rational account).

The paper proceeds as follows. In Section 2, we introduce our survey data and the regression framework we use to analyze them. In Section 3, we present our survey results. Section 4 describes the field experiment. Section 5 presents our experimental results. Section 6 checks for robustness. Section 7 summarizes our major conclusions and discusses their policy implications for the assimilation of Muslim immigrants in France.

## 2 Survey data and regression framework

In this section, we present our survey, the questions we use to compare SM and SX assimilation patterns in France, and the regression framework that allows us to analyze this difference, on average and over time.

### 2.1 The survey

Our survey of 511 Serers and Joolas in France, both Christians and Muslims, was administered from April to June 2009 by the professional survey firm *Conseils-Sondages-Analyses (CSA)*. The survey relied on a nonrandom sample of 332 respondents initially contacted by linking Serer and Joola surnames with cell numbers,<sup>4</sup> and interviewed by telephone, and 179 respondents interviewed face to face through a chain referral sampling procedure.

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<sup>4</sup>To avoid bias, we did not rely on landlines, as they would tap only the wealthiest and, least typical, of the immigrant population.

The following four eligibility criteria were used: the respondent had to (1) be 18 to 40 years of age, (2) be born in France, (3) have at least one parent or grandparent born outside of France, and (4) have at least one Serer- or Joola-speaking grandparent.

Quotas were used to ensure better sample representativeness. Respondents represent 1.2 % of the eligible population base. We define as SM (SX) individuals who reported to be Muslim (Christian) and to belong to a family of Muslim (Christian) tradition. Overall, 466 respondents (91 % of the whole sample) are classified as either SM or SX—339 (or 73 %) are classified as SM and 127 (27 %) as SX.<sup>5</sup>

## 2.2 Measuring assimilation patterns

We rely on two categories of questions to measure the assimilation patterns of SM and SX. The first category, meant to capture a respondent's strength of identification with her ancestry, measures attachment to the respondent's country (Senegal) or continent (Africa) of origin. The second category captures a respondent's strength of identification with a now-secularized French culture and society.<sup>6</sup>

Attachment to the country or continent of origin is based on nine questions capturing (i) whether the respondent has ever been to Africa, (ii) whether the respondent sends remittances to Africa, (iii) the degree of sympathy the respondent has toward Senegalese living in Senegal, (iv) whether the grandparents of the respondent's best friend originate from Senegal or other African countries, (v) whether the association the respondent belongs to is related to Senegal or to Africa,<sup>7</sup> (vi) whether the respondent believes she shares much in common with people of the same country of origin as her family, (vii) whether the respondent wants to be buried in Senegal or in Africa, (viii) whether the respondent owns a home in Africa, and (ix) whether the respondent disapproves of a Senegalese student who chooses not to renounce a scholarship in a top French university to take care of a sick mother in Senegal.

Respondent identification with French culture and society is based on seven questions capturing (i) the degree of sympathy the respondent has toward French people, (ii) whether the respondent believes that immigrants should do whatever is possible to avoid conflict with the hosting society, (iii) whether the grandparents of the respondent's best friend originate from France, (iv) whether the respondent shows political preferences that can be positioned on a typical left-wing/right-wing scale,<sup>8</sup> (v) whether the respondent considers herself to share much in common with French people, (vi) whether the respondent wants to be buried in France, and (vii) whether

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<sup>5</sup>The sample remains disproportionately Muslim, and this is not surprising given that Senegal is more than 90 % Muslim. Our identification of two Senegalese ethnic groups with substantial numbers of Christians is key, given the predominance of Islam in Senegal.

<sup>6</sup>Assimilation into French culture can be measured in part by the reduction in the level in which religion infuses other aspects of life. Indeed, in the 2006 *World Values Survey* for France, 13 % say that religion is very important in their lives; by contrast, in the 2008 *Afrobarometer* survey for Senegal, 95.8 % say that religion is very important in their lives. Relying on our definition of assimilation, those who claim that religion is less important in their lives are thus assimilating into French norms.

<sup>7</sup>Note that there is no difference in the probability of participating in an association between SM and SX.

<sup>8</sup>Politics in Senegal do not follow a typical left-wing/right-wing scale the way they do in France. Instead, the most common political dimensions in Senegal are region, Sufi order, and cousinage (see Smith (2010)).

the respondent approves of a scenario whereby a man of Senegalese origin hides from his white son's friends so that they may believe the son is rooted French.

The strength of the respondent's identification with the host culture and society is also captured by the respondent's degree of secularization. This degree of secularization is based on six questions measuring: (i) the importance of god in the respondent's life, (ii) whether the respondent would disapprove of her child marrying a religious other, (iii) the degree of sympathy the respondent has toward people sharing the same religion, (iv) whether the best friend of the respondent is of the same religion, (v) whether the association the respondent belongs to is related to religion, and (vi) whether the respondent believes she shares much in common with people of the same religion.

### 2.3 The regression framework

To isolate whether SM and SX assimilation patterns differ on average, we estimate Eq. 1:

$$y = a + b.SM + c.Time + \mathbf{d}'\mathbf{X} + \epsilon, \quad (1)$$

where  $y$  is the respondent's answer to one of the questions above. The dummy SM is equal to 1 if the respondent is SM and to 0 if the respondent is SX. Therefore, coefficient  $b$  captures the difference between the answer provided by SM respondents and the answer provided by SX respondents. The variable Time is continuous and captures the number of years elapsed since arrival of the first migrant in the respondent's family. We also control for  $\mathbf{X}$ , a vector of socioeconomic characteristics of the respondent. This vector contains information on characteristics that are either pretreatment (i.e., they concern features of the household before migration of the first migrant to France) or exogenous. The pretreatment control is the education of the first migrant. The exogenous controls are the gender and the age of the respondent. We do not include post-treatment (i.e., post-migration) controls since those would capture part of the "Muslim" effect and therefore bias the coefficient of the dummy SM.

To compare the assimilation patterns of SM and SX over time, we estimate Eq. 2:

$$y = a + b.SM + c.SM.Time + d.Time + e.SM.Age + \mathbf{f}'\mathbf{X} + \epsilon. \quad (2)$$

The variables SM, Time, and  $\mathbf{X}$  are defined as in Eq. 1. Coefficient  $d$  captures the impact of Time on SX assimilation.<sup>9</sup> The sum of coefficients  $c$  and  $d$  captures the impact of Time on SM assimilation.<sup>10</sup> Consequently, coefficient  $c$  (the coefficient of the interaction term SM.Time) provides the difference between the evolution of SM and SX assimilation patterns over time.

<sup>9</sup>Alternatively, coefficient  $d$  could capture the fact that the first migrants in SX families systematically differ with regard to assimilation, depending on when they arrived to France. We rule out this possibility in the robustness checks.

<sup>10</sup>Alternatively, the sum of coefficients  $c$  and  $d$  could capture the fact that the first migrants in SM families systematically differ with regard to assimilation, depending on when they arrived to France. We rule out this possibility in the robustness checks.

Note that one expects a positive correlation between the age of the respondent and the number of years elapsed since the arrival of the first migrant in the respondent's family. This intuition is confirmed by our data (this correlation is equal to 0.39 and significant at the 1 % confidence level). Therefore, we also control in Eq. 2 for the interaction term  $SM.Age$  where the variable  $Age$  represents the age of the respondent, in order to ensure that coefficient  $c$  does not partially capture an age effect.<sup>11</sup>

### 3 Survey results

In this section, we show (by estimating Eq. 1) that SM and SX assimilation patterns differ on average, with SM assimilation into French culture and society significantly lower than SX assimilation into French culture and society. We then show (by estimating Eq. 2) that there is no convergence between SM and SX, namely that SM lower assimilation persists over time.

#### 3.1 Do SM and SX assimilation patterns differ on average?

The fourth column in Tables 1, 2, and 3 provides results from our estimation of coefficient  $b$  in Eq. 1 on the three sets of questions measuring the assimilation patterns of migrants: attachment to Senegal and Africa (Table 1), identification with France (Table 2), and secularization (Table 3). This coefficient captures the difference in assimilation between SM respondents and SX respondents.

The fourth column in Table 1 presents ordinary least squares (OLS) estimates for the coefficient of the dummy SM in Eq. 1 over the set of questions that capture the attachment of the respondent to Senegal and/or Africa. This coefficient is always positive. Moreover, it is almost always significant at least at the 90 % confidence level. The exceptions are displayed in rows 3 and 9, which capture, respectively, the degree of sympathy the respondent has toward Senegalese living in Senegal and whether the respondent disapproves of a Senegalese student who chooses not to renounce a scholarship in a top French university to take care of a sick mother in Senegal. Still, across seven of our nine indicators, our results clearly indicate that, on average, SM respondents show significantly stronger attachment to Senegal and Africa as compared to their Christian counterparts.<sup>12</sup>

The fourth column in Table 2 presents OLS estimates for the coefficient of the dummy SM in Eq. 1 over the set of questions that capture identification with the French culture and society, excluding secularization. This coefficient is always negative. Moreover, it is always significant at least at the 90 % confidence level. Our

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<sup>11</sup>We thank an anonymous referee for bringing this issue to our attention.

<sup>12</sup>Controlling for the variable  $Time$ , as well as for the respondent's socioeconomic characteristics, substantially reduces the number of observations due to missing data for these controls. However, the significance level for the dummy SM does not change if we impute missing data (results available upon request).

**Table 1** Comparing average SM/SX attachment to the country/continent of origin

	SX (a)	SM (b)	Raw diff. (b) - (a)	Regression-adjusted diff. (b) - (a)
(1) Visit: whether the respondent has ever been to Africa	0.850 (N = 127)	0.920 (N = 339)	0.070** (N = 466)	0.105** (N = 295)
(2) Remit: whether the respondent sends remittances to Africa	0.520 (N = 127)	0.584 (N = 339)	0.064 (N = 466)	0.102* (N = 295)
(3) Sympathy: sympathy of the respondent toward Senegalese living in Senegal (from 1 to 10)	8.268 (N = 127)	8.298 (N = 329)	0.030 (N = 456)	0.048 (N = 292)
(4) Best friend: whether the grandparents of the respondent's best friend originate from Africa	0.504 (N = 127)	0.634 (N = 328)	0.130** (N = 455)	0.188*** (N = 290)
(5) Association: whether the association the respondent belongs to is related to Africa	0.286 (N = 42)	0.425 (N = 134)	0.139** (N = 176)	0.265*** (N = 127)
(6) Commonalities: commonalities the respondent believes she shares with people from Senegal (from 1 to 4)	2.969 (N = 127)	3.175 (N = 338)	0.206** (N = 465)	0.217** (N = 295)
(7) Burial: whether the respondent wants to be buried in Africa	0.437 (N = 103)	0.767 (N = 287)	0.330*** (N = 390)	0.386*** (N = 250)
(8) Home: whether the respondent owns a home in Africa	0.795 (N = 127)	0.891 (N = 339)	0.096** (N = 466)	0.134** (N = 295)
(9) Sick mother = disapproval of a Senegalese student who does not renounce a scholarship in a top French university to take care of a sick mother in Senegal (from 1 to 3)	2.276 (N = 127)	2.361 (N = 332)	0.085 (N = 459)	0.096 (N = 292)

Columns 1 and 2 report the mean value for SX and SM, respectively. Column 3 reports the difference between the mean values in columns 1 and 2. Column 4 reports the OLS estimate of coefficient *b* in Eq. 1, when standard errors are robust

\*  $p = 0.1$ ; \*\*  $p = 0.05$ ; \*\*\*  $p = 0.01$



**Table 2** Comparing average SM/SX identification with the French culture and society

	SX (a)	SM (b)	Raw diff. (b) - (a)	Regression-adjusted diff. (b) - (a)
(1) Sympathy of the respondent toward French people (from 1 to 10)	7.619 (N = 126)	7.404 (N = 329)	-0.215 (N = 455)	-0.673*** (N = 291)
(2) No conflict: whether the respondent believes immigrants should do whatever possible to avoid conflict with the hosting society	0.593 (N = 123)	0.500 (N = 326)	-0.093* (N = 449)	-0.135** (N = 286)
(3) Best friend: whether the grandparents of the respondent's best friend originate from France	0.394 (N = 127)	0.201 (N = 328)	-0.193*** (N = 455)	-0.262*** (N = 290)
(4) Left-Right: whether the respondent's political preferences can be positioned on a typical left-wing/right-wing scale	0.752 (N = 117)	0.615 (N = 312)	-0.137*** (N = 429)	-0.176*** (N = 276)
(5) Commonalities: commonalities the respondent believes she shares with French people (from 1 to 4)	2.888 (N = 125)	2.713 (N = 335)	-0.175** (N = 460)	-0.173* (N = 292)
(6) Burial: whether the respondent wants to be buried in France	0.485 (N = 103)	0.160 (N = 287)	-0.325*** (N = 390)	-0.357*** (N = 250)
(7) Hide father: approval of a man of Senegalese origin who hides from his white son's friends so that they may believe the son is a rooted French (from 1 to 3)	1.325 (N = 126)	1.203 (N = 335)	-0.122*** (N = 461)	-0.223*** (N = 294)

Columns 1 and 2 report the mean value for SX and SM, respectively. Column 3 reports the difference between the mean values in columns 1 and 2. Column 4 reports the OLS estimate of coefficient *b* in Eq. 1, when standard errors are robust

\*  $p = 0.1$ ; \*\*  $p = 0.05$ ; \*\*\*  $p = 0.01$

**Table 3** Comparing average SM/SX secularization

	SX (a)	SM (b)	Raw diff. (b) - (a)	Regression-adjusted diff. (b) - (a)
(1) God: importance of god in the respondent's life (from 1 to 10)	7.592 (N = 125)	9.006 (N = 330)	1.414*** (N = 455)	1.456*** (N = 291)
(2) Exogamy: disapproval of one's child if he/she married a religious other (from 1 to 3)	1.880 (N = 125)	2.075 (N = 335)	0.195*** (N = 460)	0.174** (N = 293)
(3) Sympathy: sympathy of the respondent toward people sharing the same religion (from 1 to 10)	8.073 (N = 124)	8.360 (N = 331)	0.287 (N = 455)	0.331 (N = 291)
(4) Best friend: whether the respondent's best friend is of the same religion	0.589 (N = 124)	0.675 (N = 320)	0.086* (N = 444)	0.107* (N = 287)
(5) Association: whether the association the respondent belongs to is related to religion	0.071 (N = 42)	0.127 (N = 134)	0.056 (N = 176)	0.048 (N = 127)
(6) Commonalities: commonalities the respondent believes she shares with people of the same religion (from 1 to 4)	2.912 (N = 125)	3.190 (N = 336)	0.278*** (N = 461)	0.272** (N = 291)

Columns 1 and 2 report the mean value for SX and SM, respectively. Column 3 reports the difference between the mean values in columns 1 and 2. Column 4 reports the OLS estimate of coefficient *b* in Eq. 1, when standard errors are robust  
*p* = 0.1; \*\**p* = 0.05; \*\*\**p* = 0.01

results clearly indicate that, on average, the identification of SM respondents with the host culture and society is significantly lower than the one observed among SX.<sup>13</sup>

The fourth column of Table 3 presents OLS estimates for the coefficient of the dummy SM in Eq. 1 over the set of questions that capture secularization.<sup>14</sup> This coefficient is always positive. Moreover, it is almost always significant at least at the 90 % confidence level. The exceptions are displayed in rows 3 and 5, which capture respectively the degree of sympathy the respondent has toward people sharing the same religion, as well as whether the association the respondent belongs to is related to religion. Across four of our six indicators, our results clearly indicate that, on average, SM respondents display significantly less secularization as compared to their Christian counterparts.<sup>15</sup> In sum, our results reveal that Muslim immigrants show significantly lower assimilation (i.e., higher attachment to their culture of origin and lower identification with the host culture and society, with notably lower secularization) than do their Christian counterparts.

### 3.2 How does the difference in assimilation patterns between SM and SX evolve over time?

In Table 4, we estimate coefficient  $c$  in Eq. 2, that is, whether assimilation patterns of SM and SX change over time. We restrict our attention to assimilation outcomes that saw a significant SM effect in Table 1 through Table 3. Our results show that the coefficient of the interaction term SM.Time is almost never significant, suggesting that SM respondents do not catch up with matched SX respondents over time. Moreover, in the three instances (out of 18 dependent variables) where the coefficient of the interaction term SM.Time reaches statistical significance, the effect indicates divergence, not convergence, in SM and SX assimilation over time. We elaborate on these results below.

In Table 4, panel A presents OLS estimates for coefficient  $c$  in Eq. 2 over the set of questions that capture respondent attachment to Senegal and Africa. This coefficient is not significant in column 1 or in columns 3 through 6, indicating that higher SM attachment and lower SX attachment to their country/continent of origin do not change over time.<sup>16</sup> Note, however, that this coefficient is positive and significant in columns 2 and 7 (whether the respondent sends remittances and whether the respondent owns a home in Africa), indicating a divergence between SM and SX

<sup>13</sup>The significance level for the dummy SM does not change if we impute missing data, with the exception of row 2 (whether the respondent believes immigrants should do whatever possible to avoid conflict with the hosting society) where the dummy SM loses significance (results available upon request).

<sup>14</sup>Given the coding of our measures of secularization, a positive coefficient indicates less secularization.

<sup>15</sup>The significance level for the dummy SM does not change if we impute missing data, with the exception of row 3 (the degree of sympathy of the respondent toward people sharing the same religion) where the dummy SM becomes significant (results available upon request).

<sup>16</sup>These results hold when we impute missing data, with the exception of column 6 where the positive coefficient of the interaction term SM.Time becomes significant (i.e., SM and SX attachment to Senegal and Africa diverges over time). More precisely, the desire to be buried in Senegal or in Africa increases over time for SM, while it decreases over time for SX (results available upon request).

**Table 4** Comparing the assimilation pattern over time of SM and SX. OLS analysis

Panel A: attachment to the country/continent of origin		Remit	Visit	Best Friend	Association	Commonalities	Burial	Home
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	
SM	0.249 (0.265)	-0.084 (0.340)	-0.073 (0.341)	-0.384 (0.343)	-0.118 (0.552)	0.563* (0.321)	-0.032 (0.312)	
SM.Time	0.004 (0.005)	0.013* (0.007)	0.009 (0.008)	-0.006 (0.009)	0.009 (0.014)	0.012 (0.008)	0.011* (0.006)	
R <sup>2</sup>	0.068	0.115	0.057	0.170	0.020	0.166	0.053	
Observations	295	295	290	127	295	250	295	
Panel B: identification with the French culture and society		No conflict	Left-right	Commonalities	Burial	Hide father		
	(1)	(2)	(4)	(5)	(6)	(7)		
SM	-1.163 (1.138)	-0.362 (0.358)	-0.298 (0.280)	-0.303 (0.293)	-1.007* (0.513)	-0.407 (0.347)	-0.022 (0.374)	
SM.Time	-0.033 (0.030)	0.004 (0.009)	-0.002 (0.003)	0.008 (0.007)	-0.005 (0.014)	-0.005 (0.008)	-0.009 (0.010)	
R <sup>2</sup>	0.064	0.023	0.100	0.038	0.043	0.145	0.047	
Observations	291	286	290	276	292	250	294	
Panel C: secularization		God	Exogamy	Best Friend	Commonalities			
	(1)	(2)	(3)	(4)	(5)			
SM	0.602 (1.533)	0.815* (0.417)	0.815* (0.417)	-0.349 (0.322)	0.057 (0.561)			
SM.Time	0.081** (0.034)	0.004 (0.009)	0.004 (0.009)	0.007 (0.007)	-0.013 (0.013)			
R <sup>2</sup>	0.147	0.081	0.081	0.028	0.040			
Observations	291	293	293	287	291			

The table reports the OLS estimate of coefficient  $c$  in Eq. 2, when standard errors are robust. The dependent variables in panel A are defined in Table 1. The dependent variables in panel B are defined in Table 2. The dependent variables in panel C are defined in Table 3

\* $p = 0.1$ ; \*\* $p = 0.05$

over time. More specifically, SM are more likely—while SX are less likely—to send remittances and to own a home in Africa over time.

In Table 4, panel B presents OLS estimates for coefficient  $c$  in Eq. 2 over the set of questions that capture identification with French host culture and society excluding secularization. This coefficient is never significant, indicating that SM lower identification and SX higher identification with French culture and society do not converge over time.<sup>17</sup>

In Table 4, panel C presents OLS estimates for coefficient  $c$  in Eq. 2 over the set of questions that capture secularization. This coefficient is not significant in columns 2 through 4, indicating that higher SM attachment and lower SX attachment to their religion of origin persist over time. Note that this coefficient is positive and significant in column 1, indicating a divergence between SM and SX over time regarding the importance they attach to god. More specifically, this importance increases over time for SM, while it decreases over time for SX.<sup>18</sup> Overall, our analysis shows that SM and SX assimilation patterns do not converge, and in some cases diverge, over time.

Note that selection in the first migrant type would lead us to measure only a biased causal effect of the duration of stay on SM and SX assimilation. More precisely, the first migrants in the families of our SM and SX respondents might systematically differ with regard to patterns of assimilation, depending on when they arrived to France. If so, then the persistent divergence in assimilation levels between SM and SX over time could be due not only to the impact of time spent in France, but also to differences in assimilation levels at the time of initial migration. We address this issue in the robustness checks and find no empirical support for selection among the first migrants.

### 3.3 Discussion of our identification strategy

Our results reveal that Muslim immigrants show significantly lower assimilation (i.e., higher attachment to their culture of origin and lower identification with the host culture and society, with notably lower secularization) than do their Christian counterparts. Moreover, they show that this difference does not decrease with the time immigrants spend in France. Given our identification strategy, ours is the first analysis to identify a specific Muslim effect on immigrant assimilation in France.

One may wonder, however, whether our results are not merely driven by differences that exist between SM and SX in Senegal, rather than by differences between SM and SX experiences in France.<sup>19</sup> Notably, SX are a minority, while SM are a majority in Senegal. Thus, it could be that SM are assimilating in France just fine, but that SX had such a difficult time in Senegal that their assimilation in France is superior to that of the SM. The success of Jews from Russia to the USA or Maronites from Lebanon to Europe is consistent with this interpretation, although the

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<sup>17</sup>These results hold when we impute missing data (results available upon request).

<sup>18</sup>These results hold when we impute missing data (results available upon request).

<sup>19</sup>We thank an anonymous referee for bringing this issue to our attention.

selection issue (in which oppressed minorities with ambition are more likely to emigrate than majority group members with similar ambition) prevents us from drawing any causal inference from these examples. Yet, continued religious harmony in Senegal (Mecham 2006) as well as similar economic outcomes between SM and SX in Senegal before migration (see Appendix 1) suggests that SX are not an oppressed minority there.

Still, the simple fact of belonging to a minority in the country of origin may sharpen one's adaptation skills even if this minority is not oppressed, by forcing one to adapt to the majority culture. The ideal identification strategy would therefore have consisted in studying immigrants in France from a country in which the two religions are evenly matched. Yet, we have not found a sizeable immigrant community in France that fits this description and which has been established for a sufficiently long time to allow us to study the evolution of its assimilation pattern. It is worth noting, however, that Adida et al. (2013) provide evidence suggesting that our results are not simply driven by a "minority effect." Relying on the European Social Survey, Adida et al. compare the integration pattern in Western European countries of Muslim and Christian immigrants from Bosnia and Herzegovina, the only country worldwide where the share of Christians and Muslims is almost equal.<sup>20</sup> Even in this context—where Christians are not a religious minority in their country of origin—Christians report significantly less discrimination in Western European host countries than do their Muslim counterparts.

## 4 Experimental setup

The second objective of this paper is to understand the mechanisms underlying the persistence of lower assimilation of Senegalese Muslims in France. To do so, we rely on field experiments that we conducted in France in 2009 (the same year we collected our survey data) and in 2010. The 2009 field experiment brings together rooted French (FFF), SM and SX in the context of behavioral games. In this section, we first present our 2009 subject pool. We then describe our 2009 games, designed to allow us to examine how SM and FFF (relative to SX and FFF) behave toward each other with regard to unconditional altruism and trust (i.e., belief about others' unconditional altruism). Finally, we explain, based on the 2010 field experiment, how we identify that FFF condition their behavior specifically on the Muslimness of our players, rather than on some other factor, i.e. the foreignness of players' names.

### 4.1 The 2009 subject pool

In March 2009, we set up a series of experimental games among FFF, SM, and SX. For those games, we recruited 27 Senegalese players: 16 self-identified as Muslims

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<sup>20</sup> According to the 2009 Report on International Religious Freedom by the US Department of State, 97 % of the population in Bosnia and Herzegovina is either Christian or Muslim. Muslims stand for 46.5 % of this population (while Christians account for 53.5 %).

(SM) and 11 as Christians (SX).<sup>21</sup> We relied upon three separate networks to recruit these Senegalese players. Two of the networks came from the ethnographers who were conducting family histories for our wider research project and who were asked to recruit subjects by merely telling them they had heard about experiments with a chance to earn a lot of money. No mention was to be made about Senegalese specificity or religion. The third network came from a Senegalese night watchman (not from the Joola or Serer communities) who worked at a student dorm. He was given a quota for the SM and SX and paid for each recruit who showed up for registration and participated in the games. Here again, no mention was to be made about Senegalese specificity or religion. Table 5 presents the results of a difference of means test comparing the socioeconomic characteristics of our SM and SX participants. SM and SX do not differ on critical characteristics such as gender, age, education, or household income. The only characteristic on which they differ is religiosity, with SX being significantly more religious than SM. This introduces a bias we treat in our regressions by controlling for the socioeconomic characteristics of SM and SX players and notably for their religiosity.<sup>22</sup>

It is important to emphasize that African Muslims are less spontaneously associated with Islam in the French collective imagination because they know little to no Arabic and interact indiscriminately with African Muslims and African non-Muslims (Diop 1988). Any evidence of FFF discrimination against SM should thus be interpreted as a lower bound on the magnitude of FFF anti-Muslim discrimination: levels of discrimination against Maghrebis, the Muslims who are at the center of public debates about the role of Islam in France, would almost certainly be higher (had there been a way to identify a Muslim effect from a Maghrebi immigrant sample in France) than those we find for Senegalese Muslims.

To complement our game sessions, we also recruited 53 non-Senegalese players. The ethnoreligious breakdown of these 53 non-Senegalese players was as follows: 29 players, among whom 21 were FFF, were of European background; 12 players were of sub-Saharan African background; and 12 players were of North African background.

We recruited these players in the ethnically diverse setting of the 19th district of Paris.<sup>23</sup> For our experiments to be unbiased, we could not give players the impression that we wanted to know if they were conditioning their moves on the religious backgrounds of our Senegalese players and therefore needed to conduct the experiments in a setting in which the Senegalese players would not appear to be exceptional. The 19th district, with its high levels of national, ethnic, and religious diversity, offered a

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<sup>21</sup>Our subjects are coded by religious self-identification or, when that information is missing, ascribed religious heritage based on the advice of an ethnographer with expertise on Senegalese culture, who served on our research team.

<sup>22</sup>Note that this bias, if anything, runs against us finding FFF discrimination against SM since SM participants are more moderate in their religious practices.

<sup>23</sup>According to the 1999 French census, the percentage of individuals living in this district who are born in France is 63.5 (against 82.4 for all of Paris). A good picture of the diversity in the 19th district is offered in the French film “Entre les murs” (“The Class” in its English language version, a film directed by Laurent Cantet, 2008) that received the Palme d’Or at the 2008 Cannes Film Festival.

**Table 5** Socioeconomic characteristics of SM and SX participants in our 2009 experiments. Difference of means analysis

Variable	SM ( <i>a</i> )	SX ( <i>b</i> )	Difference ( <i>b</i> – <i>a</i> )
	0.50	0.55	+0.05
Female	( <i>N</i> = 16)	( <i>N</i> = 11)	<i>p</i> = 0.83
	33.19	31.45	–1.74
Age	( <i>N</i> = 16)	( <i>N</i> = 11)	<i>p</i> = 0.59
	7.33	7.63	+0.30
Education	( <i>N</i> = 15)	( <i>N</i> = 8)	<i>p</i> = 0.83
	3.79	4.00	+0.21
Household income	( <i>N</i> = 14)	( <i>N</i> = 9)	<i>p</i> = 0.85
	2.60	4.90	+2.30
Religiosity	( <i>N</i> = 15)	( <i>N</i> = 10)	<i>p</i> = 0.00
	0.43	0.36	–0.07
Knows players from previous game sessions	( <i>N</i> = 16)	( <i>N</i> = 11)	<i>p</i> = 0.71

The table reports arithmetic means for the subsamples of SM and SX players and two-tailed *t* tests assuming unequal variances. “Female” takes the value 1 if the participant is female and 0 otherwise. “Age” is equal to the age of the participant. “Education” ranges from 1 (less than primary school completed) to 10 (higher than college degree completed). “Household income” ranges from 1 (less than 500 euros monthly) to 11 (more than 7,500 euros monthly). “Religiosity” ranges from 1 (never attends religious services) to 7 (attends religious services several times a week). “Knows players from previous sessions” takes the value 1 if the participant knows players who participated in previous game sessions and 0 otherwise.

solution that worked: in the exit surveys for the experiments, only one subject speculated that religion had anything to do with the purposes of the games,<sup>24</sup> and only one Senegalese player out of a total 27 verbally wondered if there was something odd about having other players in the room from his Senegalese language group.

We used a stratified (by population density) but not always fully random recruitment procedure centered on the 21 metro stations of the 19th district. In a fully random protocol, we assigned a weight to each metro station based on the density of the area in which it is located, with the higher density stations getting more cards in our random draw. Each recruitment team drew a metro station for each recruitment day, and then a number from 1 to 10 to determine which passerby to invite as a game recruit, but because we wanted to ensure a large number of interactions between our SX/SM sample and FFF, we deviated from this protocol to assure ourselves a sufficient number of FFF players. When potential subjects who looked as if they were FFF walked by, recruiters were instructed to ignore the sequence of selection and to ask them to participate in our experiment. Passersby who were willing to hear our appeal were told that they could win up to 148 euros for about two and a half hours of

<sup>24</sup>In the exit questionnaire, we asked: “Que pensez-vous que notre équipe aura appris sur vous à travers vos décisions aujourd’hui?” [What do you think our team will have learned about you from the decisions you made today?]



game participation,<sup>25</sup> games which were designed to investigate “how people from Ile-de-France [Parisian region] make decisions about money.”

Turn-downs were about 30 %, introducing some bias that likely leads to an over-representation of individuals favorable to diversity among our sample (relative to a random sample of game participants). Indeed, those individuals who agreed to participate in our experiments were told that they would interact with others from the Ile-de-France region, a region commonly known to be ethnically and religiously diverse. We can test this intuition for FFF players. To do so, we compare the average political ideology of our FFF sample to that of a random sample of rooted French from the 2009 European Social Survey (“ESS” henceforth). We use a question that measures where respondents stand on a left-wing/right-wing scale, capturing a tendency to support social change versus a tendency to preserve traditional values. One’s position on a left-wing/right-wing scale therefore reveals, among other things, attitudes toward diversity. In order to obtain a comparable group of rooted French respondents in our experiment and in the ESS, we selected a subsample of ESS respondents who were born in France and whose parents were born in France. Unfortunately, the ESS does not provide information about the birthplace of the respondents’ grandparents. We thus cannot exclude ESS respondents with one or more grandparents born abroad: our sample of rooted French respondents from the ESS is thus, if anything, more open to diversity than would be a sample of rooted French respondents with four grandparents born in metropolitan France (the definition of FFF for our experimental games). This bias thus runs against us finding any difference between our FFF players and the rooted French respondents in the ESS, since we hypothesize that the latter are more open to diversity than a random sample of FFF. Table 6 presents the results of a difference of means analysis between our FFF and the ESS rooted French. It shows that our FFF sample is, on average, more left wing than the random sample of rooted French respondents in the 2009 ESS (significant at the 99 % confidence level). These results are confirmed by an OLS analysis reported in Table 7. In this table, the variable “European Social Survey” takes the value 1 if the individual is a respondent in the 2009 ESS and 0 if she is a participant in our 2009 experiment. The coefficient for this variable is always positive and highly significant, whether one controls for the gender (column 2), age (column 3), education (column 4), or household income (column 5) of the individual. We therefore have confirmation that FFF participants in our 2009 experiments are more open to diversity compared to a representative sample of FFF in France that same year. As a consequence, our results suffer from a bias that again leads to an underestimation of anti-Muslim discrimination on the part of FFF.

#### 4.2 The 2009 games

The 2009 field experiment comprised two phases: a registration phase, during which we collected demographic and behavioral data that we later used for the composition

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<sup>25</sup>This stands for roughly 8.5 times the hourly minimum wage in France in 2009.

**Table 6** Position of FFF respondents to the 2009 ESS and of FFF participants in our 2009 experiments on a left-wing/right-wing scale. Difference of means analysis

FFF respondents to the 2009 ESS (a)	FFF participants in our 2009 experiment (b)	Diff (b - a)
1.94 (N = 64)	1.42 (N = 19)	-0.52* p = 0.01

The table reports a difference of means analysis. The variable of interest captures the position of respondents on a left-wing/right-wing scale. It ranges from 1 to 3, where 1 means "more leftist than rightist," 2 means "in-between," and 3 means "more rightist than leftist"

\*  $p = 0.01$

of the player sets;<sup>26</sup> and a game phase, during which subjects played a series of experimental games. We supervised eight sessions of games of 10 players each held in a rented private language school in the 19th district in Paris, over the course of two weekends, on Friday evenings after work and on Sunday. Three of the sessions were all male, three of the sessions were all female, and two of the sessions were mixed gender.

When subjects arrived at a game session, they were given a code number. They were then told that since they would be interacting with strangers for the next few hours, interactions would be more personal if they wrote their first names on a label and pasted that label on their chests. All subjects complied without question or concern. The only information players had about each other was therefore their looks, their manners, their dress, and their first names. None wore any clothes or jewelry revealing religious affiliation, with the exception of one non-Senegalese player, who wore a headscarf signaling a Muslim identity. After check-in was completed, they were brought to an open room with the other players, given magazines to read, and monitored in a way that discouraged any conversation or interaction.

#### 4.2.1 The sequencing of the games

The session was comprised of five experimental games which were all designed to examine how SM and FFF interact with one another (relative to SX and FFF): (i) a

<sup>26</sup>At registration, we collected demographic data from participants, potentially priming them about identity issues, and thereby biasing our results. This is unlikely, however, given that at least 2 weeks separated the registration and game phases. Moreover, as explained in the text, what we told the players about our games and where we held the sessions served to downplay any suggestion that religious identities had any role in our intervention. The success of this strategy was revealed in our exit questionnaires, which asked participants what they thought our team had learned about them throughout the games: only one respondent out of a total 80 mentioned religion.

**Table 7** Position of FFF respondents to the 2009 ESS and of FFF participants in our 2009 experiment on a left-wing/right-wing scale. OLS analysis

	Dep. var.: position on a left-wing/right-wing scale				
	(1)	(2)	(3)	(4)	(5)
(1) European Social Survey	0.516** (0.177)	0.522** (0.176)	0.517** (0.179)	0.473* (0.191)	0.447* (0.198)
(2) Female		0.063 (0.183)	0.054 (0.202)	0.046 (0.203)	-0.007 (0.211)
(3) Age			0.001 (0.006)	-0.001 (0.006)	0.000 (0.007)
(4) Education				-0.093 (0.105)	-0.050 (0.111)
(5) Household income					-0.130 (0.089)
$R^2$	0.065	0.066	0.066	0.074	0.110
Observations	83	83	83	83	75

The table reports OLS estimates. The unit of observation is the respondent. The dependent variable ranges from 1 to 3, where 1 means “more leftist than rightist,” 2 means “in-between,” and 3 means “more rightist than leftist.” “European Social Survey” takes the value 1 if the individual is a respondent to the 2009 ESS, and 0 if she is a participant in our 2009 experiments. “Female” takes the value 1 if the individual is female and 0 otherwise. “Age” is equal to the age of the individual. “Education” ranges from 1 (less than lower secondary completed) to 4 (post secondary completed). “Household income” ranges from 1 (first quintile) to 5 (fifth quintile). Standard errors are robust

\* $p = 0.05$ ; \*\* $p = 0.01$

simultaneous trust game, (ii) a speed-chatting game, (iii) a voting game, (iv) a dictator game, and (v) a strategic dictator game.<sup>27</sup>

In the following, we describe and present evidence from the first of those games, the simultaneous trust game, which was the only game to take place before the socialization of players with one another (via the speed-chatting game). We also briefly refer to the results stemming from the other games (described in Appendix 2) to show that they are consistent with those obtained from the simultaneous trust game.

Note that the sequencing of our games raises a potential concern with contamination effects of previous games on players’ behavior during the subsequent games, especially if players learned about other players’ game decisions once they were allowed to interact and communicate freely (during the speed-chatting game).

<sup>27</sup>Throughout the session, and out of sight from the players, monitors kept a full account of all answers and earnings for each player. At the end of the session, as players answered an exit survey, the winnings for each player were placed in sealed envelopes for them to take home. Full protocols (in French, but with English translations) are available upon request. Here, we review only what is necessary for interpreting the results presented in the subsequent section. We take this opportunity to thank our six recruiters and monitors for their incredible hard work, intellectual contributions throughout, and dedication to the project: Mathieu Couttenier, Jacinto Cuvi Escobar, Karine Marazyan, Etienne Smith, Josselin Thuilliez, and Séverine Toussaert.

Such contamination is highly unlikely, however. During our initial presentation of the experiments to the players, we emphasized that all game decisions would remain anonymous and private at all times. Moreover, in our instructions for the speed-chatting game, we stressed that players were to get to know—in French “faire connaissance avec”—their speed-chatting partners, meaning that players were instructed to find out information about who their partners were outside of the lab, not what their partners did during the game. Finally, we instructed all players to keep notes of their speed-chatting conversations. In these notes, there is no evidence that game-behavior information was exchanged during the speed-chatting game.

#### 4.2.2 *The simultaneous trust game*

The 2009 simultaneous trust game was the first game participants played in our experimental setup. In this game, subjects sat quietly in a waiting room (they were supervised such that they could not communicate with one another) and were called to a table in pairs. For each pair, one player was assigned the role of “sender” and the other “receiver.” The pairs were created to ensure that all FFF in a session played the simultaneous trust game twice with each Senegalese player in that session, once for each role. The sender was allotted 3 euros in her account and could send any amount  $\{0, 1, 2, 3\}$  to the receiver (an amount that was known by the players to be tripled) by marking this amount on a sheet that the receiver would never see. The receiver simultaneously marked on a sheet the sender would never see what percentage  $\{0, 1/3, 2/3, 1\}$ <sup>28</sup> of the amount received would be sent back to the sender.<sup>29</sup> After each play, the senders and the receivers returned to the waiting room, not knowing if they would be called again or in what role.

The amount sent by the sender in the trust game is commonly considered by experimental economists as a sign of trust that Cox (2004) defines as being “inherently a matter of the beliefs that one agent has about the behavior of another” (Cox (2004), 263). In other words, the amount sent by the sender in the trust game captures the sender’s belief that the receiver will be generous to her. However, the amount sent by the sender has also been shown to partially capture unconditional altruism, that is, the sender’s willingness to be generous to the receiver irrespective of what the receiver

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<sup>28</sup>In order to avoid the equal split option from becoming a focal point in this game (Schelling 1960), we did not offer it.

<sup>29</sup>The novelty of our simultaneous trust game with respect to the original trust game introduced by Berg et al. (1995) is in the simultaneity of the decisions made by the sender and by the receiver. We preferred the simultaneous trust game over the original trust game for several reasons. Our objective was to treat each trust game played by our subjects as a one-shot game in order to mimic everyday life random encounters between strangers. It was therefore critical to avoid any reputation effect that would have occurred if the receivers learned how much particular senders had sent in previous games. This procedure also brings a touch of realism since most interactions in real life happen under incomplete information. In this respect, removing sequentiality in the decision process looks less artificial. Furthermore, since our protocol introduced a socialization phase after the simultaneous trust game, in which players would get to know each other, we did not want their conversations to be biased by knowledge of their partners’ actions during the simultaneous trust game.

does (Fershtman and Gneezy 2001; Camerer 2003; Cox 2004; Ashraf et al. 2006).<sup>30</sup> As for the amount sent back by the receiver in the simultaneous trust game, it is most plausibly interpreted as a signal of unconditional altruism and/or belief-based reciprocal altruism (i.e., an altruistic behavior based on the receiver's belief that the sender is being kind to her, keeping in mind that the actions of the sender and of the receiver are simultaneous).<sup>31</sup>

Put differently, the simultaneous trust game offers the advantage of capturing the two common types of discrimination, taste-based and statistical discrimination, on the side of both the sender and the receiver. More precisely, differences in unconditional altruism by the sender and/or the receiver should reveal taste-based discrimination. According to Becker (1957), taste-based discrimination indeed results from the "special disutility" which a player attaches to contact with another player (see Arrow 1998). By contrast, differences in trust on the side of the sender and/or differences in belief-based reciprocal altruism on the side of the receiver should reveal statistical discrimination. Following Arrow (1972), statistical discrimination would indeed result from the negative belief which a player holds about the ability of another player to be kind to her.<sup>32</sup> Although our simultaneous trust game, in itself, cannot distinguish between taste-based versus statistical discrimination, we exploit information from our other games to identify which one is at stake in our players' decisions.

#### 4.3 Disentangling FFF response to SM Muslimness from FFF response to SM foreignness

Since SX and SM players were indistinguishable to FFF players in terms of dress and appearance, the only observable signals differentiating our Senegalese players were their first names, which were written on a label pasted on their chests. The names of our SM and SX players are listed in Table 8. As should be apparent, all the SX had names that are from the Christian Bible (and which are common French names), but none of the Muslim players did. From the point of view of the FFF, therefore, the SX had *French* names. However, the SM all had *foreign* names, some of them sounding *Muslim*, others sounding more *African*. This raises a question: did SM and SX first names adequately signal their religious affiliation, or might they have signaled something else, such as foreignness? It is critical to test whether FFF behavior toward SM is a response to SM Muslimness or to SM foreignness.

To distinguish between these two possibilities, we recruited 50 FFF players from the 19th district in 2010 to participate, among other things, in a field experiment

<sup>30</sup>A third possible confound of positive transfers by the sender in the trust game is risk aversion, yet risk aversion has not been shown to be a serious confounding factor. For instance, Eckel and Wilson (2004) do not find behavioral risk measures to be significantly correlated with the decision to send in the trust game. They conclude that "subjects do not see trust as a problem of risk" (Eckel and Wilson (2004), 464).

<sup>31</sup>See Trivers (1971) on the role that reciprocal altruism plays in cooperation.

<sup>32</sup>Originally, Arrow introduced statistical discrimination to account for employers discriminating racially when they believe that the unobserved determinants of performance are correlated with race, which is observable (Arrow (1998), 96).

**Table 8** First names of the 2009 SM and SX players

First names of SM players	First names of SX players
Amadou	Cecile
Amie	Christine
Astou	Daniel
Awa	Ephigenie
Cire	Gaston
Fatoumata	Helene
Ibou	Louis
Ibrahima	Mamadou Jean
Kals	Nina
Khady	Robert Antoine
Mamadou Lamine	Therese
Moustapha	
Ndeye	
Ousmane	
Sidy	
Sire	
Tamsir	
Yacine	

asking subjects to guess the ethnic and religious affiliations of names. We contracted the professional survey firm CSA to recruit respondents with addresses in the 19th district, and they did so relying on the phone directory. The sample was nonrandom, since it depended on the agreement of individuals who were called to participate in the experiment, but through quotas on neighborhood (*quartier*), gender, and age, we guarded against systematic bias with respect to critical observable characteristics.<sup>33</sup> Respondents were invited to register if and only if they reported that all four grandparents were born within France's continental boundaries, thereby qualifying as rooted French. The average age of players was 40, ranging from 20 to 59. Twenty-seven were female, and 23 were male. The games took place in an office building in the nearby 18th district and were administered by computer, in groups of five. Each player sat in front of a computer without interacting with any of the other four players who were all sitting in front of their monitors.

The 50 FFF participants in our 2010 experiments played a Names Game allowing us to address whether the FFF in our 2009 experiments were responding more to the religion of their fellow players' first names or to their foreignness. FFF players

<sup>33</sup>Recall that we find that our sample of rooted French players in 2009 is more left-wing in political ideology than is the ESS sample of rooted French, suggesting that our sample is more open to diversity than the average rooted French. We do not have a 2010 ESS to conduct such an analysis for our 2010 sample of rooted French players. However, our 2010 sample of rooted French players was recruited from the same district as our 2009 sample and was introduced to the games in the exact same manner. It is therefore likely that the direction of the bias in 2010 is the same as the one we found in 2009.



**Fig. 1** Sample screenshot for the 2010 Names Game

were presented, sequentially, a series of names among which the names of our 2009 SM and SX players. For purposes of expediency, a random half of FFF players were shown half of SM and SX players’ first names; the other half were shown the rest. For each name, FFF players were asked to guess the religious heritage of the person in question (Christian, Muslim, Buddhist, Jewish, Hindu, Animist). Figure 1 illustrates a sample screenshot of the Names Game. The 2010 Names Game informs us that SX were unambiguously identified as Christians, consistent with the fact that they had names that are from the Christian Bible (and which are common French names). However, SM were not unambiguously characterized as Muslims. More precisely, the Names Game allowed us to compute, for each SM first name, the percentage of FFF who identified it as a “Muslim” name. Based on this information, we created two subgroups among SM: SMM (“Senegalese Muslims with Muslim names”) were those whose first names were guessed as “Muslim” by more than 50 % of the FFF answering that question, and SMA (“Senegalese Muslims with African names”) were the remaining SM. Table 9 shows that only those with first names of Arabic origin were considered as Muslims (SMM).<sup>34</sup> By contrast, the remaining SM (SMA) were considered as Christians or affiliated to more traditional religions like Animism.<sup>35</sup>

**5 Are SM and FFF locked in a suboptimal equilibrium?**

In the following, we first show that our games reveal a pattern—viz. SM are less cooperative than are SX throughout our experimental games—that is consistent with the lower assimilation levels we have identified for SM (relative to SX) in our survey. We then suggest that this lower assimilation (and its persistence, as documented in our survey data) is consistent with Muslims and rooted French being locked in a suboptimal equilibrium whereby (i) rooted French exhibit taste-based discrimination

<sup>34</sup>Only two of the 11 SM with first names of Arabic origin were not characterized as “Muslim” by a majority of FFF (these first names are Ibou and Sidy). Similarly, only one of the seven SM with first names not of Arabic origin were characterized as “Muslim” by a majority of FFF (this first name is Ndeye).

<sup>35</sup>And indeed, although the bulk of Serers and Joolas have converted to Islam or Christianity, many of them continue to follow traditional beliefs (see Berg and Ruth (2009)).

**Table 9** Categorization of 2009 SM players' first names as SMM or SMA by our 2010 FFF players

First names of SMM players	First names of SMA players
Amadou	Amie
Awa	Astou
Fatoumata	Cire
Ibrahima	Ibou
Khady	Kals
Mamadou Lamine	Sidy
Moustapha	Sire
Ndeye	Tamsir
Ousmane	
Yacine	

against those they are able to identify as Muslims (due to the fact that these Muslims keep recognizable Muslim first names instead of adopting French-sounding names), and (ii) Muslims perceive French institutions as systematically discriminatory against them (and therefore assimilate less, many retaining Muslim first names). To be sure, Muslims' lower assimilation may not only be due to rooted French discrimination. More precisely, no active discrimination by rooted French is necessary to explain that, upon arrival to France, SM show lower assimilation than do SX. Due to their religion, SX are indeed culturally closer to a Christian-heritage host country like France than are SM. Assimilating in France should therefore be an easier process for SX than for SM. However, if this is the story, then convergence between SM and SX assimilation should occur over time. The fact that this is not the case suggests that an additional barrier, possibly the discrimination of SM by rooted French, is at stake.

### 5.1 Experimental evidence of assimilation patterns among SM and SX

Our survey results clearly indicate that SM are more attached to their country of origin and less attached to the host culture and society than are SX in France, and that this difference persists over time. If our games are consistent with this pattern, we expect SM players to be less cooperative (i.e., to show lower unconditional altruism and trust) toward their game partners in France than are SX.

To test this implication, we use data from the simultaneous trust game to estimate Eq. 3:

$$y = a + b.(FFF \rightarrow SM) + c.(SX \rightarrow All) + d.(SM \rightarrow All) + \mathbf{e}' \cdot \mathbf{X} + \mathbf{f}' \cdot \mathbf{Z} + \mathbf{g}' \cdot \mathbf{\Pi} + \epsilon. \quad (3)$$

The dependent variable  $y$  refers to the amount sent by the sender to the receiver if we focus on the sender's behavior and to the amount sent back by the receiver to the sender if we focus on the receiver's behavior. The dummy  $(FFF \rightarrow SM)$  is equal to 1



if player 1 is FFF and player 2 is SM and to 0 otherwise.<sup>36</sup> The dummy (SM  $\rightarrow$  All) is equal to 1 if player 1 is SM and player 2 is any of the players with which player 1 was matched, and to 0 otherwise. The dummy (SX  $\rightarrow$  All) is equal to 1 if player 1 is SX and player 2 is any of the players with which player 1 was matched, and to 0 otherwise. The reference category is the dummy (FFF  $\rightarrow$  SX) that is equal to 1 if player 1 is FFF and player 2 is SX and to 0 otherwise. Consequently, the difference between coefficients  $d$  and  $c$  captures the difference between the behavior of SM player 1 and the behavior of SX player 1 toward their game partners. Put differently, this difference allows us to test whether SM hold back in their donations as the sender or receiver as compared to SX. Moreover, coefficient  $b$  captures the difference between the behavior of FFF player 1 toward SM player 2 and the behavior of FFF player 1 toward SX player 2. We rely on this information when we tackle the next section dedicated to whether FFF players 1 discriminate against SM players 2 (as compared to SX players 2). Equation 3 also controls for the socioeconomic characteristics of players 1 and 2 (gender, age, household income, education, religiosity, and whether the player knows players who participated in previous game sessions) that are denoted by  $\mathbf{X}$  and  $\mathbf{Z}$ , respectively. Finally, we introduce  $\mathbf{\Pi}$ , a vector of session fixed effects. Note that standard errors are clustered at the player 1 level, since different game decisions by the same player 1 cannot be considered independent of one another.

That SM senders are significantly less cooperative toward all game partners is shown on Table 10. Columns 1, 3, 5, and 7 present OLS estimates from four model specifications of Eq. 3, restricting our attention to the amount sent in the simultaneous trust game. In column 1, we control for the ethnic identity of the sender and of the receiver only. In column 3, we add session fixed effects. In column 5, we include the sociodemographic characteristics of the sender and of the receiver. Since this inclusion generates a reduction in the sample size from 178 to 134 observations due to missing values for the income, education, and religiosity of some of the senders and receivers, we run a multiple imputation analysis in column 7. The last Wald test at the bottom of Table 10 shows that the difference between coefficients  $d$  (in row (5)) and  $c$  (in row (4)) is significant in the most complete specifications presented in columns 5 and 7.<sup>37</sup>

Results are the same, as revealed in Table 11 (columns 1, 3, 5, and 7), when we restrict our attention to the amount sent back in the simultaneous trust game. Here, with OLS estimates from four model specifications of Eq. 3, controls are introduced stepwise, as in Table 10. Again, since the inclusion of the sociodemographic characteristics of the sender and receiver generates a reduction in the sample size from 166 to 129 observations due to missing values, we run a multiple imputation analysis in column 7. The last Wald test at the bottom of Table 11 again shows

<sup>36</sup>Player 1 is the sender when we analyze the amount sent and the receiver when we analyze the amount sent back. Player 2 is the receiver when we analyze the amount sent and the sender when we analyze the amount sent back. In Eq. 3, we not only focus on the behavior of SM and SX toward their game partners, but also on the behavior of FFF toward SM and SX. This is because we rely on Eq. 3 in the following section to test whether FFF discriminate against SM in the simultaneous trust game.

<sup>37</sup>We ignore columns 2, 4, 6, and 8 for now, which are analyzed in Section 5.2.1

**Table 10** Amount sent by the sender in the 2009 simultaneous trust game. OLS analysis

	Dep. var.: amount sent by the sender							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) FFF → SM	-0.071		-0.166		-0.352		-0.232	
(2) FFF → SMM		-0.062		-0.220		-0.543		-0.326
(3) FFF → SMA		-0.083		-0.098		-0.117		-0.108
(4) SX → All	-0.675***	-0.675***	-0.614***	-0.614***	-1.011***	-0.988***	-0.670**	-0.656**
(5) SM → All	-0.801***	-0.801***	-0.853***	-0.855***	-1.437***	-1.443***	-1.071***	-1.066***
SES of the sender								
(6) Female					-0.516	-0.526*	-0.413*	-0.402*
(7) Age					0.001	0.003	0.002	0.003
(8) Household income					0.029	0.033	0.033	0.035
(9) Education					-0.020	-0.024	-0.030	-0.031
(10) Religiosity					-0.058	-0.060	-0.053	-0.055
(11) Knows players from previous sessions					0.824***	0.856***	0.632***	0.641***
SES of the receiver								
(12) Female					-0.038	-0.031	-0.106	-0.113
(13) Age					0.005	0.003	0.004	0.003
(14) Household income					0.026	0.028	0.018	0.020
(15) Education					-0.035	-0.036	-0.030	-0.030
(16) Religiosity					-0.034	-0.034	-0.030	-0.029
(17) Knows players from previous sessions					0.019	0.001	-0.014	-0.024

**Table 10** (continued)

	Dep. var.: amount sent by the sender							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>p</i> value of the test: (1) = 0	0.60		0.26		0.11		0.27	
<i>p</i> value of the test: (2) = 0		0.77		0.37		0.11		0.26
<i>p</i> value of the test: (3) = 0		0.64		0.61		0.62		0.66
<i>p</i> value of the test: (4) = (5)	0.66	0.66	0.22	0.22	0.02	0.01	0.02	0.02
Session fixed effects	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Multiple imputation analysis	No	No	No	No	No	No	Yes	Yes
<i>R</i> <sup>2</sup>	0.117	0.117	0.293	0.294	0.474	0.479	0.382	0.384
Observations	178	178	178	178	134	134	178	178

The table reports OLS estimates. The unit of observation is a dyad formed of FFF and SM or SX players. The dependent variable ranges from 0 (the sender sends nothing to the receiver) to 3 (the sender sends her total endowment to the receiver). “FFF → SM” takes the value 1 if the sender is FFF and the receiver is SM, and 0 otherwise. “FFF → SMM” takes the value 1 if the sender is FFF and the receiver is SMM, and 0 otherwise. “FFF → SMA” takes the value 1 if the sender is FFF and the receiver is SMA, and 0 otherwise. “SM → All” takes the value 1 if the sender is SM and the receiver is any game partner, and 0 otherwise. “SX → All” takes the value 1 if the sender is SX and the receiver is any game partner, and 0 otherwise. The omitted category is the dummy “FFF → SX” that takes the value 1 if the sender is FFF and the receiver is SX, and 0 otherwise. “Female” takes the value 1 if the player is female and 0 otherwise. “Age” is equal to the age of the player. “Education” ranges from 1 (less than primary school completed) to 10 (higher than college degree completed). “Household income” ranges from 1 (less than 500 euros monthly) to 11 (more than 7,500 euros monthly). “Religiosity” ranges from 1 (never attends religious services) to 7 (attends religious services several times a week). “Knows players from previous sessions” takes the value 1 if the player knows players who participated in previous game sessions and 0 otherwise. Standard errors (not reported here due to space constraints) are clustered at the sender level

\**p* = 0.1; \*\**p* = 0.05; \*\*\**p* = 0.01

that the difference between coefficients  $d$  (in row (5)) and  $c$  (in row (4)) is significant in the most complete specifications presented in columns 5 and 7, showing that SM receivers send back significantly less to their game partners than do SX receivers. In sum, the results from the 2009 simultaneous trust game, revealing that SM are outliers among our 19th district players, are consistent with those of our survey, which indicate that SM are less assimilated in France than are SX. It is important to emphasize that we observe the same pattern in the games that followed the socialization phase (via the speed-chatting game): SM allocate significantly less as leaders in a voting game (where elected group leaders distributed a 30-euro prize between themselves and their arbitrarily designated electors) than do SX, and SM give significantly less as donors in the subsequent dictator game than do SX (see Appendix 2).

## 5.2 Do FFF discriminate against SM and why?

In this section, we uncover one reason why SM assimilate less than do SX in France. Specifically, we investigate FFF discrimination against SM and whether such discrimination is taste-based, statistical, or both.

### 5.2.1 Do FFF discriminate against SM?

We analyze the potential discriminatory behavior of our players in the simultaneous trust game by relying on Eqs. 3 and 4 which introduce the distinction between SM with recognizable Muslim names (i.e., SMM) and SM without recognizable Muslim names (i.e., SMA):

$$\begin{aligned}
 y = & a + b.(FFF \rightarrow SMM) + c.(FFF \rightarrow SMA) \\
 & + d.(SX \rightarrow All) + e.(SM \rightarrow All) \\
 & + \mathbf{f}' \cdot \mathbf{X} + \mathbf{g}' \cdot \mathbf{Z} + \mathbf{h}' \cdot \mathbf{\Pi} + \epsilon.
 \end{aligned} \tag{4}$$

The dummy (FFF  $\rightarrow$  SMM) is equal to 1 if player 1 is FFF and player 2 is SMM and to 0 otherwise. The dummy (FFF  $\rightarrow$  SMA) is equal to 1 if player 1 is FFF and player 2 is SMA and to 0 otherwise. The reference category is again the dummy (FFF  $\rightarrow$  SX), equal to 1 if player 1 is FFF and player 2 is SX and to 0 otherwise. As a consequence, coefficient  $b$  captures the difference between the behavior of FFF player 1 toward SMM player 2 and the behavior of FFF player 1 toward SX player 2. In other words, it tells us whether rooted French discriminate against Muslims with recognizable Muslim names relative to otherwise-matched Christians. Coefficient  $c$  captures the difference between the behavior of FFF player 1 toward SMA player 2 and the behavior of FFF player 1 toward SX player 2. In other words, it tells us whether rooted French discriminate against Muslims without recognizable Muslim names relative to otherwise-matched Christians. Put differently, coefficients  $b$  and  $c$  allow us to test whether FFF player 1's discrimination against SM player 2 (if it exists) is a reaction to SM

**Table 11** Amount sent back by the receiver in the 2009 simultaneous trust game. OLS analysis

	Dep. var.: amount sent back by the receiver							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) FFF → SM	-0.092*		-0.076		-0.243***		-0.149*	
(2) FFF → SMM		-0.152*		-0.161		-0.331**		-0.251**
(3) FFF → SMA		-0.001		0.052		-0.125		0.022
(4) SX → All	-0.031	-0.031	-0.023	-0.021	-0.076	-0.070	0.032	0.050
(5) SM → All	-0.117	-0.117	-0.097	-0.099	-0.275**	-0.282**	-0.128	-0.121
SES of the receiver								
(6) Female					0.025	0.011	0.115	0.115
(7) Age					0.001	0.002	0.002	0.003
(8) Household income					-0.010	-0.009	-0.004	-0.002
(9) Education					0.016	0.014	-0.003	-0.004
(10) Religiosity					-0.027	-0.027	-0.042	-0.044*
(11) Knows players from previous sessions					0.069	0.081	0.107	0.113
SES of the sender								
(12) Female					-0.093	-0.096	-0.039	-0.049
(13) Age					0.002	0.002	0.001	0.000
(14) Household income					0.006	0.008	0.006	0.008
(15) Education					-0.022	-0.024	-0.027*	-0.028*
(16) Religiosity					-0.044**	-0.044**	-0.033*	-0.031
(17) Knows players from previous sessions					0.152*	0.135	0.084	0.061

**Table 11** (continued)

	Dep. var.: amount sent back by the receiver							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>p</i> value of the test: (1) = 0	0.08		0.24		0.01		0.07	
<i>p</i> value of the test: (2) = 0		0.06		0.11		0.01		0.02
<i>p</i> value of the test: (3) = 0		0.99		0.56		0.22		0.84
<i>p</i> value of the test: (4) = (5)	0.37	0.37	0.36	0.34	0.09	0.07	0.10	0.08
Session fixed effects	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Multiple imputation analysis	No	No	No	No	No	No	Yes	Yes
<i>R</i> <sup>2</sup>	0.021	0.030	0.128	0.143	0.244	0.257	0.194	0.216
Observations	166	166	166	166	129	129	166	166

The table reports OLS estimates. The unit of observation is a dyad formed of FFF and SM or SX players. The dependent variable ranges from 0 (the receiver sends back nothing to the sender) to 1 (the receiver sends back her total endowment to the sender). “FFF → SM” takes the value 1 if the receiver is FFF and the sender is SM, and 0 otherwise. “FFF → SMM” takes the value 1 if the receiver is FFF and the sender is SMM, and 0 otherwise. “FFF → SMA” takes the value 1 if the receiver is FFF and the sender is SMA, and 0 otherwise. “SM → All” takes the value 1 if the receiver is SM and the sender is any game partner, and 0 otherwise. “SX → FFF” takes the value 1 if the receiver is SX and the sender is any game partner, and 0 otherwise. The omitted category is the dummy “FFF → SX” that takes the value 1 if the receiver is FFF and the sender is SX, and 0 otherwise. “Female” takes the value 1 if the player is female and 0 otherwise. “Age” is equal to the age of the player. “Education” ranges from 1 (less than primary school completed) to 10 (higher than college degree completed). “Household income” ranges from 1 (less than 500 euros monthly) to 11 (more than 7,500 euros monthly). “Religiosity” ranges from 1 (never attends religious services) to 7 (attends religious services several times a week). “Knows players from previous sessions” takes the value 1 if the player knows players who participated in previous game sessions and 0 otherwise. Standard errors (not reported here due to space constraints) are clustered at the receiver level

\**p* = 0.1; \*\**p* = 0.05; \*\*\**p* = 0.01

players 2's Muslimness or foreignness. Vectors  $\mathbf{X}$ ,  $\mathbf{Z}$  and  $\mathbf{\Pi}$  are defined as in Eq. 3.

Table 10 presents OLS estimates for Eq. 3 (models 1, 3, 5, and 7) and Eq. 4 (models 2, 4, 6, and 8), restricting our attention only to senders. The coefficient in row (1), columns 1, 3, 5, and 7, shows that the amount sent by FFF senders to SM receivers is lower than the amount sent by FFF senders to SX receivers, although never significantly so (see the  $p$  value of the Wald test “(1)=0” at the bottom of Table 10). The coefficients in rows (2) and (3), columns 2, 4, 6, and 8, allow us to extend this conclusion to the cases where we distinguish between SMM and SMA receivers (see the  $p$  value of the Wald test “(2)=0” and “(3)=0” at the bottom of Table 10). The OLS analysis therefore cannot disconfirm the null hypothesis that FFF send equally to SX and SM, even those with recognizable Muslim names.

What happens when FFF act as receivers in the simultaneous trust game? Table 11 presents OLS estimates for Eq. 3 (models 1, 3, 5, and 7) and Eq. 4 (models 2, 4, 6, and 8), restricting our attention only to receivers. The coefficient in row (1), columns 1, 3, 5, and 7, shows that the amount sent back by FFF receivers to SM senders is lower (and significantly so in the most complete specifications) than the amount sent back by FFF receivers to SX senders. Moreover, the coefficients in rows (2) and (3), columns 2, 4, 6, and 8 reveal that the significantly lower amount sent back by FFF receivers to SM senders is driven by FFF discrimination against SMM, not by FFF discrimination against SMA (see the  $p$  value of the Wald test “(2)=0” and “(3)=0” at the bottom of Table 11). The OLS analysis therefore uncovers that FFF receivers discriminate against SM and more precisely against SMM. It is important to stress that the nonsignificant difference between the amounts sent back by FFF receivers to SMA and SX senders is not due to the low number of observations associated with those interactions. A difference of means analysis (not shown, but available upon request) indeed reveals that FFF receivers return *exactly the same* proportion of the amount they receive to SMA and SX senders (i.e., 48 % on average). By contrast, FFF receivers return only an average 33 % of the amount they receive to SMM senders.

Although the results from the 2009 simultaneous trust game reveal FFF anti-Muslim discrimination, it is important to emphasize that a different pattern is observed in the games following the socialization afforded by the speed-chatting game: FFF voters are not less likely to vote for a SM than for a SX leader, FFF leaders do not allocate less to SM than to SX voters, and FFF dictators do not give less to SM than to SX recipients (see Appendix 2). Put differently, we find that FFF a priori discriminate against SM (and more precisely against those they are able to identify as Muslims), but that they stop doing so after a basic conversation with their SM game partners. This finding is consistent with intergroup contact theory which predicts that contact opportunities with the minority attenuate prejudice by the dominant group against members of the minority (Allport 1954). Note, however, that such support for intergroup contact theory is only partial and no longer holds once the number of SM and SX in the game session increases. More precisely, Adida et al. (2012) analyze the 2009 dictator game. This game is the only one that brings together all players in a single room, hence providing an opportunity to test the effect of increasing numbers of SM and SX in the room on FFF donations

to SM and SX recipients. According to intergroup contact theory, an increase in the relative size of the minority provides contact opportunities with the minority during the socialization phase and should hence reduce prejudice toward this minority. Yet, group threat theory predicts an effect that runs in the opposite direction. According to this theory, an increase in the relative size of the minority generates hostile attitudes by the dominant group toward the minority because of the perception by the dominant group of a symbolic threat to one's cultural integrity (Blalock 1967). Adida et al. (2012) report findings that are consistent with group threat theory: FFF anti-Muslim discrimination is reactivated when the proportion of SM rises. The discrimination-reducing effect of socialization therefore appears particularly weak.

### 5.2.2 *What accounts for FFF anti-Muslim discrimination?*

Discrimination of FFF receivers against SM senders in the simultaneous trust game may reflect anti-Muslim taste-based discrimination, that is, lower unconditional altruism toward SM senders (as compared to SX senders). It may also reflect statistical discrimination, that is, lower reciprocal altruism toward SM senders due to the more pessimistic beliefs of FFF about SM senders' generosity toward them.

In our follow-up 2010 experiment among 50 FFF players from the 19th district of Paris, we explicitly test the statistical discrimination hypothesis, i.e., whether FFF receivers are more pessimistic about SM senders' donation behavior toward players like them (FFF) in the 2009 simultaneous trust game. To do so, we analyze whether FFF hold different first-order beliefs about SM and SX, that is, whether they are more pessimistic about SM versus SX unconditional altruism toward FFF. We also examine whether FFF hold different second-order beliefs about SM and SX, that is, whether they expect SM beliefs about FFF unconditional altruism toward SM to be more pessimistic than SX beliefs about FFF unconditional altruism toward SX. The 2010 strategic dictator game, described in Appendix 3, allows us to test whether FFF hold different first-order beliefs about SM and about SX. Our results, also reported in Appendix 3, show that FFF guesses about SM unconditional altruism toward FFF recipients do not differ from FFF guesses about SX unconditional altruism toward FFF recipients. To test whether FFF hold different second-order beliefs about SM and SX, we rely on the 2010 double strategic dictator game. This game is described in Appendix 4. Our results, also reported in Appendix 4, show that FFF do not expect SM beliefs about FFF unconditional altruism toward SM to be more pessimistic than SX beliefs about FFF unconditional altruism toward SX. In other words, these results suggest that the difference between the amount sent back by FFF receiver to SM sender and the amount sent back by FFF receiver to SX sender reveals differences in FFF unconditional altruism toward SM and SX, not differences in FFF beliefs about SM and SX behavior.

An alternative interpretation of FFF discrimination of SM in the simultaneous trust game is that it reflects, not taste-based discrimination, but discrimination based on the belief that SX are poorer than SM and therefore need more money. In our 2010 experiment, we explicitly test whether FFF hold different beliefs



about the income levels of our 2009 SM and SX players. Our test and results are reported in Appendix 5, and show that FFF expect no difference in the monthly income of SM and SX recipients. We can thus rule out this alternative interpretation.

Overall, our results show that FFF discriminate against Muslims they are able to identify as Muslims.<sup>38</sup> Moreover, our experimental evidence suggests that this discrimination is taste-based.<sup>39</sup> Note that one may be surprised that rooted French mistakenly believe that SM and SX are equally cooperative. Indeed, their everyday real-world interactions with SM and SX should allow them to update their beliefs based on what they observe. However, this presupposes that FFF are actually interacting with SM: this would require us to believe that interactions between FFF and SM are sufficiently frequent to permit updating, an assumption belied by the levels of social isolation faced by most immigrant communities in France.<sup>40</sup>

### 5.3 Do SM distrust their hosts more than do SX?

We have shown that FFF discriminate against Muslims they identify as such. We now ask whether Muslims distrust their hosts, that is, rooted French and French institutions, more than do SX (i.e., whether SM beliefs about rooted French and French institutions' attitudes toward SM are more negative than SX beliefs about rooted French and French institutions' attitudes toward SX). If so, their nonassimilation can be best understood as part of an equilibrium. To address this question, we turn to the 2009 strategic dictator game<sup>41</sup> and then the CSA survey to measure SM (relative to SX) distrust toward rooted French and French institutions, respectively.

<sup>38</sup>Our finding contradicts the claim by Jacquemet and Yannelis (2012) according to which anti-minority discrimination by the dominant group in Western countries does not reflect discrimination against any specific minority, but rather discrimination against all groups which sound foreign (what they call "ethnic homophily").

<sup>39</sup>The fact that FFF do not treat SM and SX differently when FFF are senders but that they do discriminate against SM when FFF are receivers brings additional support to the fact that FFF exhibit taste-based, not statistical, discrimination. Indeed, the amount sent in the trust game, whether simultaneous or not, is commonly considered by experimental economists as a signal of trust (hence the name given to this game). In this context, if FFF exhibit taste-based discrimination, it is not surprising that they do not discriminate against SM when they behave as senders, but that they do discriminate when they behave as receivers. Besides belief-based reciprocal altruism, the amount sent back in the simultaneous trust game indeed captures unconditional altruism.

<sup>40</sup>See Algan et al. (2012) who show that even in the HLM sector where immigrant communities and rooted French live close to each other, housing surveys show very low levels of social interaction between them.

<sup>41</sup>Note that relying on this game runs against us finding any difference between SM and SX beliefs about FFF behavior toward SM and SX, respectively. As already mentioned, the 2009 strategic dictator game and its companion, the 2009 dictator game, took place after the speed-chatting game, once we can no longer identify anti-Muslim discrimination on the part of FFF, yet our results show that this phenomenon is not anticipated (or fully anticipated at least) by Muslims since the 2009 strategic dictator game reveals differences between SM and SX beliefs about FFF behavior toward SM and SX, respectively.

### 5.3.1 Do SM distrust rooted French more than do SX? Results from the 2009 strategic dictator game

The strategic dictator game (see Appendix 2 for the protocol) helps us determine the beliefs of our 2009 players about FFF unconditional altruism toward the various recipients in the 2009 dictator game. Namely, our analysis of this game—in which players are rewarded for correctly guessing the actual donations in the dictator game of an FFF player, to SM and SX faces—allows us to test whether (i) SM distrust FFF more than do SX, meaning that SM expectations about FFF unconditional altruism toward SM are significantly lower than SX expectations about FFF unconditional altruism toward SX, and (ii) SM expect FFF to be less generous toward SM than toward SX (i.e., to discriminate against SM).

We test both hypotheses by estimating Eq. 5 over a set of triads composed of SM or SX guessers, FFF dictators, and SM or SX recipients:

$$y = a + b.(SM \rightsquigarrow FFF \rightarrow SM) + c.(SM \rightsquigarrow FFF \rightarrow SX) + \mathbf{d}' \cdot \mathbf{X} + e.Face + \mathbf{f}' \cdot \mathbf{\Pi} + \epsilon, \quad (5)$$

where  $y$  refers to the guesses about FFF dictators' donations. The dummy  $(SM \rightsquigarrow FFF \rightarrow SM)$  is equal to 1 if the guesser is SM and the recipient is SM and to 0 otherwise. The dummy  $(SM \rightsquigarrow FFF \rightarrow SX)$  is equal to 1 if the guesser is SM and the recipient is SX and to 0 otherwise. The reference category is the dummy  $(SX \rightsquigarrow FFF \rightarrow SX)$  that is equal to 1 if the guesser is SX and the recipient is SX and to 0 otherwise. As a consequence, coefficient  $b$  captures the difference between SM expectations about FFF dictators' donations to SM recipients and SX expectations about FFF dictators' donations to SX recipients. In other words, coefficient  $b$  allows us to test whether SM distrust rooted French more than do SX (i.e., whether SM beliefs about FFF unconditional altruism toward SM is lower than SX beliefs about FFF unconditional altruism toward SX). Moreover, the difference between coefficient  $b$  and coefficient  $c$  captures the difference between SM expectations about FFF dictator donations to SM recipients and SM expectations about FFF dictator donations to SX recipients. In other words, this difference allows us to test whether SM expect FFF anti-Muslim discrimination, that is, whether SM expect FFF to be less generous toward SM than toward SX.  $\mathbf{X}$  is a vector of controls for a series of socioeconomic characteristics of the guesser (gender, age, household income, education, religiosity, and whether the player knows players who participated in previous game sessions). Additionally, in order to run a within-face analysis, we introduce the Face dummy that is equal to 1 if the recipient is the Senegalese woman (and 0 if the recipient is the Senegalese man). Finally, we introduce  $\mathbf{\Pi}$ , a vector of session fixed effects. Note that standard errors are clustered at the guesser level since guesses from the same guesser cannot be considered independent of one another.

Table 12 presents OLS estimates from four model specifications of Eq. 5. In column 1, we control for the ethnic identity of the guesser and of the recipient only. In column 2, we add recipient face fixed effects as well as session fixed effects. In column 3, we include the sociodemographic characteristics of the guesser. Since this

**Table 12** SM and SX guesses in the 2009 strategic dictator game. OLS analysis

	Dep. var.: guesses about dictators' donations			
	(1)	(2)	(3)	(4)
(1) SM $\rightsquigarrow$ FFF $\rightarrow$ SM	-0.636*	-0.678**	-1.062*	-0.729
	(0.368)	(0.326)	(0.552)	(0.497)
(2) SM $\rightsquigarrow$ FFF $\rightarrow$ SX	-0.303	-0.336	-0.765	-0.381
	(0.377)	(0.295)	(0.516)	(0.450)
(3) Female			0.129	0.954
			(0.820)	(0.655)
(4) Age			-0.006	-0.018
			(0.024)	(0.020)
(5) Household income			0.114**	0.091
			(0.051)	(0.054)
(6) Education			-0.057	-0.079
			(0.073)	(0.074)
(7) Religiosity			0.036	-0.085
			(0.126)	(0.089)
(8) Knows players from previous sessions			-0.183	-0.095
			(0.516)	(0.313)
<i>p</i> value of the test: (1) = 0	0.09	0.05	0.07	0.16
<i>p</i> value of the test: (1) = (2)	0.20	0.24	0.45	0.29
Session fixed effects	No	Yes	Yes	Yes
Recipient face fixed effects	No	Yes	Yes	Yes
Multiple Imputation Analysis	No	No	No	Yes
<i>R</i> <sup>2</sup>	0.072	0.497	0.649	0.623
Observations	41	41	34	41

The table reports OLS estimates. The unit of observation is a triad formed of SM or SX guessers, FFF dictators and SM or SX recipients. The dependent variable ranges from 0 (the guesser guesses that the FFF dictator gives 0 euro to the recipient) to 5 (the guesser guesses that the FFF dictator gives 5 euros to the recipient). “SM  $\rightsquigarrow$  FFF  $\rightarrow$  SM” takes the value 1 if the guesser is SM and the recipient is SM, and 0 otherwise. “SM  $\rightsquigarrow$  FFF  $\rightarrow$  SX” takes the value 1 if the guesser is SM and the recipient is SX, and 0 otherwise. The omitted category is the dummy “SX  $\rightsquigarrow$  FFF  $\rightarrow$  SX” that takes the value 1 if the guesser is SX and the recipient is SX, and 0 otherwise. “Female” takes the value 1 if the guesser is female and 0 otherwise. “Age” is equal to the age of the guesser. “Education” ranges from 1 (less than primary school completed) to 10 (higher than college degree completed). “Household income” ranges from 1 (less than 500 euros monthly) to 11 (more than 7,500 euros monthly). “Religiosity” ranges from 1 (never attends religious services) to 7 (attends religious services several times a week). “Knows players from previous sessions” takes the value 1 if the guesser knows players who participated in previous game sessions and 0 otherwise. Standard errors are clustered at the guesser level

\**p* = 0.1; \*\**p* = 0.05

inclusion generates a reduction in the sample size from 41 to 34 observations due to missing values, we run a multiple imputation analysis in column 4.

The coefficient in row (1) in columns 1, 2, and 3 is negative and significant at least at the 90 % confidence level, confirming that SM expectations about FFF

unconditional altruism toward SM are significantly lower than SX expectations about FFF unconditional altruism toward SX.<sup>42</sup> In other words, our results reveal that SM distrust FFF more than do SX. However, the last Wald test at the bottom of Table 12 (which is never significant in all four columns) shows that SM higher distrust toward FFF is not accompanied by SM expectations of FFF discrimination against them. More precisely, SM do not expect FFF to be less generous toward SM than toward SX. They simply expect, more than do SX, lower FFF unconditional altruism toward both SM and SX.

This last result is consistent with the lessons we were able to draw from ethnographic interviews for our project. These interviews were conducted in 2009 and covered the assimilation patterns of 19 SM and 22 SX in the greater Paris region (Ile-de-France), Lyon, Nantes, and Bordeaux.<sup>43</sup> Although SM respondents were more likely to report a sense of being unwanted in France as compared to SX respondents, only one of the SM respondents considered religion as the reason for such discrimination. By contrast, race was highlighted by a majority of SM, as well as by a majority of SX, as the reason underlying discrimination in France.

One should note that the difficulty of SM to figure out on which ground they are discriminated against by FFF is easily understandable: as already emphasized when we motivated our identification strategy, research on discrimination itself has so far been unable to disentangle a religious effect from other possible confounds such as race. However, if SM do not manage to clearly identify the cause of FFF discrimination in face-to-face interactions, one expects them to show better ability in correctly updating their beliefs when FFF behavior is mediated by French institutions (labor market, schooling system, administration, etc). Two nonmutually exclusive explanations could account for this discrepancy in SM ability to detect FFF discrimination. First, FFF are likely to avoid interpersonal interactions with Muslims, precisely because, as we have shown, they attach disutility (distaste) to contact with Muslims: Muslims therefore lack opportunities to correctly update their beliefs. Second, FFF may be susceptible to acting in a socially desirable way in a context where their actions are observable (which is not the case in our field experiment, where all player decisions were anonymous and private). By contrast, FFF cannot avoid dealing with Muslims—and thus discriminating against them—through French institutions. This is all the more true since, behind the veil of institutions, FFF individual actions are not observable and, thus, not prone to social desirability bias. The following section puts this intuition to test.

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<sup>42</sup>Although this result holds both in a difference of means analysis (not shown here) and in the first three columns of Table 12, it loses significance in column 4 when the multiple imputation analysis is run (but the  $p$  value of 0.16 associated with the coefficient in row (1) is close to statistical significance). This weakening of the significance is likely due to the fact that multiple imputation typically generates high standard errors when the number of observations is low (Eq. 6 is estimated on 41 observations only).

<sup>43</sup>The project employed two ethnographers to run these interviews: Etienne Smith (then a Ph.D. candidate in political science at Sciences-Po, who had conducted extensive field research in Senegal, and speaks Wolof, the *lingua franca* of Senegal, a language spoken by nearly all of our respondents) and Mahnaz Shirali (a Ph.D. in Sociology at the Ecole des Hautes Etudes en Sciences Sociales who has published extensively on Muslim youth and gender in France and Iran).

### 5.3.2 Do SM distrust French institutions more than do SX? Results from the CSA survey

Seven questions in the CSA survey allow us to capture the respondent's distrust toward French institutions, and specifically (i) the schooling system, (ii) the police, (iii) the parliament, (iv) the administration, (v) the judicial system, (vi) the trade unions, and (vii) private firms. We analyze SM and SX answers to those questions by estimating Eq. 1. Results are reported in Table 13. We observe that the coefficient of the dummy SM is always positive. Moreover, with the exception of column 2 (distrust toward the police), it is always significant at least at the 95 % confidence level. These findings clearly indicate that distrust toward French institutions is significantly higher among SM than among SX respondents, despite the fact that survey questions are prone to elicit socially desirable answers.<sup>44</sup> These results are fully consistent with those stemming from the 2009 strategic dictator game according to which SM distrust FFF more than do SX.

Does the CSA survey allow us to go one step further by showing that SM expect French institutions to be more discriminatory toward SM than toward SX (a result that did not emerge among the face-to-face interactions of the 2009 strategic dictator game)? Six questions in the CSA survey measure whether the respondent considers that the following French institutions treat individuals on an equal basis: the police, the immigration authorities, the prefecture, the judicial system, the schooling system, and the Pôle Emploi (the French national employment agency). Results are reported in Table 14. We observe that the coefficient of the dummy SM is always negative and significant: SM are less likely than SX to agree that these various French institutions treat individuals on an equal basis.<sup>45</sup>

Overall, our findings reveal that SM distrust their hosts (both rooted French and French institutions) more than do SX, but this distrust, as our survey instrument suggests, is fully recognized as such only in the context of evaluating French institutions. Combined with our result that rooted French exhibit taste-based discrimination against those they are able to identify as Muslims, these findings are best summarized in terms of a discriminatory equilibrium between rooted French and Muslims: Muslims, who perceive discrimination as institutionalized, are reluctant to assimilate, and rooted French, who are able to identify Muslims as such due to their lower assimilation, reveal their distaste for Muslims by acting less altruistically towards them.

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<sup>44</sup>The significance level for the dummy SM does not change if we impute missing data, with the exception of column 3 (i.e., distrust toward the parliament) and column 5 (i.e., distrust toward the judicial system) where the dummy SM loses significance (results available upon request).

<sup>45</sup>The significance level for the dummy SM does not change if we impute missing data, with the exception of column 1 (i.e., agreement with the fact that the police treats individuals on an equal basis) and column 2 (i.e., agreement with the fact that immigration authorities treat individuals on an equal basis) where the dummy SM loses significance (results available upon request).

**Table 13** Comparing SM and SX distrust toward French institutions. OLS analysis

		Dep. var.: distrust toward French institutions						
		Schooling system	Police	Parliament	Administration	Judicial system	Trade unions	Private firms
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) SM		0.380*** (0.088)	0.166 (0.123)	0.313** (0.123)	0.426*** (0.105)	0.357*** (0.119)	0.209** (0.106)	0.277** (0.108)
(2) Time		0.007* (0.004)	0.004 (0.007)	0.008 (0.007)	0.003 (0.006)	0.005 (0.006)	0.007 (0.005)	0.011* (0.006)
(3) Education		-0.016 (0.025)	-0.017 (0.033)	-0.035 (0.032)	-0.036 (0.029)	-0.066** (0.031)	-0.008 (0.030)	-0.025 (0.030)
(4) Female		0.101 (0.085)	-0.136 (0.114)	-0.087 (0.112)	-0.003 (0.103)	-0.193* (0.109)	-0.173 (0.105)	-0.027 (0.104)
(5) Age		-0.004 (0.007)	-0.009 (0.010)	0.005 (0.009)	0.003 (0.009)	-0.002 (0.010)	-0.005 (0.009)	0.014 (0.009)
R <sup>2</sup>		0.073	0.018	0.043	0.060	0.067	0.031	0.062
Observations		295	295	293	295	295	289	291

The table reports OLS estimates. The unit of observation is the respondent. The dependent variables in columns 1, 2, 3, 4, 5, 6, and 7 capture distrust toward the schooling system, the police, the parliament, the administration, the judicial system, the trade unions, and private firms, respectively. Each dependent variable ranges from 1 to 4 where 1 stands for “fully trusts” and 4 stands for “fully distrusts.” “SM” takes the value 1 if the respondent is SM and 0 if the respondent is SX. The variable “Time” is continuous and captures the number of years elapsed since arrival of the first migrant in the respondent’s family. “Education” captures the education of the first migrant. It ranges from 1 (no education) to 6 (higher education). “Female” takes the value 1 if the respondent is female and 0 if the respondent is male. “Age” is equal to the age of the respondent. Standard errors are robust

\* $p = 0.1$ ; \*\* $p = 0.05$ ; \*\*\* $p = 0.01$

**Table 14** Comparing SM and SX agreement with “French institutions treat individuals on an equal basis.” OLS analysis

Dep. var.: agreement with “French institutions treat individuals on an equal basis”						
	Police (1)	Immigration authorities (2)	Prefecture (3)	Judicial system (4)	Schooling system (5)	Pôle Emploi (6)
(1) SM	-0.218* (0.125)	-0.265** (0.131)	-0.445*** (0.135)	-0.318*** (0.120)	-0.432*** (0.111)	-0.263*** (0.125)
(2) Time	-0.005 (0.006)	0.001 (0.007)	0.005 (0.007)	-0.008 (0.007)	-0.007 (0.006)	0.004 (0.007)
(3) Education	0.039 (0.032)	0.017 (0.033)	0.024 (0.037)	0.045 (0.033)	0.063* (0.033)	0.018 (0.033)
(4) Female	0.025 (0.107)	-0.222* (0.115)	-0.152 (0.123)	0.001 (0.117)	-0.086 (0.112)	-0.083 (0.120)
(5) Age	0.011 (0.009)	0.007 (0.010)	-0.013 (0.010)	0.009 (0.010)	0.004 (0.010)	-0.014 (0.010)
R <sup>2</sup>	0.027	0.033	0.047	0.041	0.070	0.023
Observations	293	286	289	293	292	274

The table reports OLS estimates. The unit of observation is the respondent. The dependent variables capture whether the respondent considers that the following French institutions treat individuals on an equal basis: the police (column 1), the immigration authorities (column 2), the prefecture (column 3), the judicial system (column 4), the schooling system (column 5), and the Pôle Emploi (column 6). Each dependent variable ranges from 1 to 4 where 1 stands for “fully disagrees” and 4 stands for “fully agrees.” “SM” takes the value 1 if the respondent is SM and 0 if the respondent is SX. The variable “Time” is continuous and captures the number of years elapsed since arrival of the first migrant in the respondent’s family. “Education” captures the education of the first migrant. It ranges from 1 (no education) to 6 (higher education). “Female” takes the value 1 if the respondent is female and 0 if the respondent is male. “Age” is equal to the age of the respondent. Standard errors are robust

\* $p = 0.1$ ; \*\* $p = 0.05$ ; \*\*\* $p = 0.01$

## 6 Robustness checks

Three factors could challenge our results. First, in the CSA survey, the initial migrant to France may systematically differ in his or her assimilation potential, depending on when she/he arrived to France. If this is the case, then the conclusion that SM lower assimilation and SX higher assimilation follow parallel trends over time (they do not converge) may not only capture the impact of the time spent in France on SM and SX assimilation, but also the fact that the initial level of assimilation upon arrival to France differs across these two groups, depending on when the first migrants in those groups settled in France. To ensure that this bias is not at work, it is therefore necessary to confirm that the gap between the assimilation of the first migrants who arrived earlier and those who arrived later does not differ across SM and SX families. Second, one may worry that SM lower cooperation toward their game partners merely captures the fact that SM and SX are characterized by different gender norms. Adida et al. (2014) indeed show that SM men are significantly less generous toward women in general than are SX men, while SM women are significantly less generous toward women of their in-group than are SX women. We therefore need to test whether our results hold when we exclude cases where the first-mover is male and the second-mover is female, as well as cases where the first and second-movers are both SM or SX females.<sup>46</sup> Third, our result that FFF receivers discriminate against SM senders in the simultaneous trust game may be biased by the influence of facial traits. In an original trust game, Eckel and Wilson (2006) indeed show that attractive receivers are viewed as more trustworthy: they are trusted at higher rates by the sender and as a consequence receive more from her. We must therefore test whether FFF anti-Muslim discrimination is robust to controls for the beauty, friendliness, and trustworthiness FFF could infer from the facial traits of our 2009 players.

### 6.1 Do the first migrants who arrived earlier and those who arrived later systematically differ in terms of assimilation across SM and SX families?

To measure the assimilation of the first migrant to France, we focus on respondents' answers to three questions in the CSA survey: (i) whether the first male migrant married a non-French (African) woman, (ii) whether the first migrant married someone of the same religion, and (iii) whether all the parents and grandparents of the respondent married someone of African background. In the following, we first investigate whether the results obtained based on these questions are consistent with our finding according to which SM show, on average, lower assimilation than do SX. We then tackle the critical issue of whether SM and SX first migrants systematically differ in terms of assimilation upon arrival in France, depending on when they arrived.

Table 15, models (1), (3), and (5) test Eq. 1 applied to the three survey measures above. The positive and significant coefficient of the dummy SM in all three columns confirms that SM first migrants are significantly more attached to their continent

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<sup>46</sup>In our simultaneous trust game, the first mover is the sender; in the voting game, it is the leader; and in our dictator game, it is the dictator.



**Table 15** Comparing the assimilation in France of SM and SX first migrants. OLS analysis

Dep. var.: Assimilation of SM and SX first migrants						
	Ist mig. married a non-French (1)	Ist mig. married a non-French (2)	Ist mig. married a co-rel. (3)	Ist mig. married a co-rel. (4)	All ancestors married an African (5)	All ancestors married an African (6)
(1) SM	0.108** (0.045)	-0.106 (0.256)	0.098* (0.052)	-0.029 (0.307)	0.117** (0.050)	0.418* (0.250)
(2) SM.Time		0.000 (0.006)		-0.002 (0.007)		-0.005 (0.006)
(3) Time	0.000 (0.002)	0.000 (0.006)	-0.002 (0.002)	-0.000 (0.007)	-0.003 (0.003)	0.001 (0.005)
(4) SM.Age		0.007 (0.008)		0.007 (0.009)		-0.004 (0.009)
(5) Education	-0.031*** (0.010)	-0.031*** (0.010)	-0.019 (0.013)	-0.019 (0.013)	-0.006 (0.012)	-0.005 (0.012)
(6) Female	0.031 (0.032)	0.031 (0.033)	0.067 (0.045)	0.065 (0.045)	-0.004 (0.040)	-0.005 (0.039)
(7) Age	-0.007** (0.003)	-0.012* (0.007)	-0.004 (0.004)	-0.009 (0.008)	-0.000 (0.004)	0.002 (0.008)
R <sup>2</sup>	0.109	0.116	0.046	0.048	0.037	0.043
Observations	246	246	279	279	286	286

The table reports OLS estimates. The unit of observation is the respondent. The dependent variable in columns 1 and 2 is a dummy that captures whether the first male migrants married a non-French woman. The dependent variable in columns 3 and 4 is a dummy that captures whether the first migrant married someone of the same religion. The dependent variable in columns 5 and 6 is a dummy that captures whether all the parents and grandparents of the respondent married someone of African background. "SM" takes the value 1 if the respondent is SM and 0 if the respondent is SX. The variable "Time" is continuous and captures the number of years elapsed since arrival of the first migrant in the respondent's family. "Education" captures the education of the first migrant. It ranges from 1 (no education) to 6 (higher education). "Female" takes the value 1 if the respondent is female and 0 if the respondent is male. "Age" is equal to the age of the respondent. Standard errors are robust

\* $p = 0.1$ ; \*\* $p = 0.05$ ; \*\*\* $p = 0.01$



**Fig. 2** Sample screenshot of the 2010 Beauty game

of origin and significantly less secularized than are SX first migrants, holding their time of arrival at its average.<sup>47</sup> These results are fully consistent with our finding according to which SM show, on average, lower assimilation than do SX.

Does the gap between the assimilation of the first migrants who arrived earlier and those who arrived later differ across SM and SX families? Table 15, models (2), (4), and (6) estimate Eq. 2 applied to the three survey measures above. The coefficient of the interaction term *SM.Time* is never significant, indicating that the difference in assimilation of first migrants between SM and SX families does not depend on the time of arrival of these first migrants.<sup>48</sup> Our main survey-based result according to which SM lower assimilation and SX higher assimilation follow parallel trends over time is therefore only due to the impact of the time spent in France, not to the additional impact of differences in assimilation between SM and SX first migrants that would depend on when they settled in France.

## 6.2 Does lower SM cooperation toward their game partners simply reflect SM gender norms?

Adida et al. (2014) show that SM men are significantly less generous toward women in general than are SX men, while SM women are significantly less generous toward women of their in-group than are SX women. We therefore need to test whether our results hold when we exclude cases where the first-mover is male and the second-mover is female, as well as cases where the first and second-movers are both SM or SX females. Our results (not shown, but available upon request) confirm that SM cooperate significantly less in the 2009 simultaneous trust game (although we lose significance regarding the amount sent back), voting game and dictator game when

<sup>47</sup>These results hold if we run a multiple imputation analysis.

<sup>48</sup>These results hold if we run a multiple imputation analysis.

**Table 16** Amount sent back by the receiver in the 2009 simultaneous trust game, controlling for the beauty, friendliness, and trustworthiness of the 2009 SM, SX, and FFF players

	Dep. var.: amount sent back by the receiver	
	(1)	(2)
(1) FFF → SM	-0.207*	
	(0.097)	
(2) FFF → SMM		-0.298*
		(0.118)
(3) FFF → SMA		-0.031
		(0.126)
(4) SX → All	0.103	0.136
	(0.131)	(0.129)
(5) SM → All	-0.136	-0.120
	(0.099)	(0.101)
Facial traits of the receiver		
(6) Beauty	-0.009	-0.014
	(0.097)	(0.099)
(7) Friendliness	0.088	0.086
	(0.261)	(0.250)
(8) Trustworthiness	0.037	0.048
	(0.231)	(0.224)
Facial traits of the sender		
(9) Beauty	0.072	0.040
	(0.080)	(0.084)
(10) Friendliness	-0.155	-0.170
	(0.241)	(0.247)
(11) Trustworthiness	0.091	0.131
	(0.237)	(0.246)
<i>p</i> value of the test: (1) = 0	0.04	
<i>p</i> value of the test: (2) = 0		0.02
<i>p</i> value of the test: (3) = 0		0.81
<i>p</i> value of the test: (4) = (5)	0.04	0.02
Sender/receiver SES controls	Yes	Yes
Session fixed effects	Yes	Yes
Multiple imputation analysis	Yes	Yes
<i>R</i> <sup>2</sup>	0.258	0.280
Observations	141	141

The table reports OLS estimates. The unit of observation is a dyad formed of FFF and SM or SX players. The dependent variable ranges from 0 (the receiver sends back nothing to the sender) to 1 (the receiver sends back her total endowment to the sender). “FFF → SM” takes the value 1 if the receiver is FFF and the sender is SM, and 0 otherwise. “FFF → SMM” takes the value 1 if the receiver is FFF and the sender is SMM, and 0 otherwise. “FFF → SMA” takes the value 1 if the receiver is FFF and the sender is SMA, and 0 otherwise. “SM → All” takes the value 1 if the receiver is SM and the sender is SM, SX or FFF, and 0 otherwise. “SX → FFF” takes the value 1 if the receiver is SX and the sender is SM, SX, or FFF, and 0 otherwise. The omitted category is the dummy “FFF → SX” that takes the value 1 if the receiver is FFF and the sender is SX, and 0 otherwise. “Beauty” ranges from 1 to 6 where 1 stands for “very ugly” and 6 stands for “very beautiful.” “Friendliness” ranges from 1 to 6 where 1 stands for “very unfriendly” and 6 stands for “very friendly.” “Trustworthiness” ranges from 1 to 6 where 1 stands for “very untrustworthy” and 6 stands for “very trustworthy.” Controls for the SES of the sender and of the receiver include their gender, age, household income, education, religiosity, and whether they know players from previous sessions. Standard errors are clustered at the sender level \**p* = 0.05

such cases are excluded. Put differently, lower SM cooperation toward their game partners is not driven by the fact that SM and SX gender norms differ.

### 6.3 Is FFF behavior in the simultaneous trust game robust to controlling for the facial traits of their game partners?

To control for the influence of facial traits in the simultaneous trust game, we asked FFF participants in our 2010 experiments to examine pictures of our 2009 players and evaluate their beauty, friendliness, and trustworthiness. More precisely, in this Beauty game, FFF players were shown, sequentially, a series of photographs of our Senegalese and FFF participants in our 2009 experiments.<sup>49</sup> For each photograph, FFF players were asked to choose, for each of three pairs of adjectives (pretty/ugly; friendly/unfriendly; trustworthy/untrustworthy) which one best corresponded to the photographed player. Six options were available for each pair. For instance, for the pair (friendly/unfriendly), the player could select “very friendly,” “friendly,” “somewhat friendly,” “somewhat unfriendly,” “unfriendly,” and “very unfriendly.” Figure 2 illustrates a sample screenshot of the 2010 Beauty game.

We assign to each Senegalese and FFF player from our 2009 experiments the average beauty, friendliness, and trustworthiness scores assigned to them by our 2010 FFF players. We add these controls in our OLS estimation of Eqs. 3 and 4 for the amount sent back by the receiver.

Table 16 reports the OLS estimates with imputation of missing values (note that the controls for the facial traits of the 2009 SM, SX, and FFF players do not have any missing values). The significant negative coefficient of the dummy (FFF → SM) in column 1 confirms that FFF receivers send back significantly less to SM senders than to SX senders, even when we control for the facial traits of the sender and of the receiver. Moreover, the significant coefficient of the dummy (FFF → SMM) and the nonsignificant coefficient of the dummy (FFF → SMA) in column 2 indicate that this result holds only for SM recipients with recognizable Muslim names (SMM).

## 7 Conclusion

This paper relies on a unique identification strategy to compare the assimilation patterns, on average and over time, of Muslim and Christian immigrants in France and, furthermore, to identify the mechanism driving those differences. Survey-based results reveal that Muslim immigrants show significantly lower assimilation (i.e., higher attachment to their culture of origin and lower identification with the host culture and society) than do their Christian counterparts and that this difference persists regardless of the time immigrants spend in France. Experimental results indicate that the persistence of lower Muslim assimilation is consistent with Muslims and rooted

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<sup>49</sup>For expediency, a random half of the 2010 FFF players were shown half of our 2009 Senegalese and FFF players; the other random half were shown the other half of our 2009 Senegalese and FFF players.

French being locked in a suboptimal equilibrium whereby (i) rooted French exhibit taste-based discrimination against those they are able to identify as Muslims (due to the fact for instance that these Muslims keep recognizable Muslim first names instead of adopting French-sounding names) and (ii) Muslims perceive French institutions as systematically discriminatory against them. This equilibrium is sustained because Muslims, perceiving discrimination as institutionalized, are reluctant to assimilate, and rooted French, who are able to identify Muslims as Muslims due to their lower assimilation, reveal their distaste for Muslims by acting less altruistically toward them.

Our finding that rooted French and SM are locked in a suboptimal equilibrium offers a potential explanation for the economic handicap faced by Muslims in France today<sup>50</sup> and highlights the need for an equilibrium shift. Indeed, taste-based discrimination against Muslims has both direct and indirect negative effects on their prospects of economic success in France. With the direct effect, taste-based discrimination should lead Muslims to perform worse than their non-Muslim counterparts in markets that are critical for successful economic integration of immigrants, such as the labor, housing, or marriage markets.<sup>51</sup> With the indirect effect, the discriminated minority assimilates less because of discrimination. This lower assimilation is expected to further strengthen the direct negative effect of anti-Muslim taste-based discrimination by potentially fueling rooted French statistical discrimination against Muslims.<sup>52</sup>

It is in the nature of equilibria that no party has an incentive to unilaterally change its behavior. This helps explain the ineffectiveness of many prejudice-reducing policies uncovered in Paluck and Green's extensive review of the literature (2009). What follows from our discussion is the necessity to take a two-pronged approach toward discrimination reduction. On the one hand, it would be useful to highlight to the rooted French that their behavior belies their republican ideals. How can this be done? Pope et al. (2011) have recently shown the benefits of broadcasting research findings on discrimination, especially in an institutional environment committed to fair play. These authors refer to the considerable media attention given to a working

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<sup>50</sup> Adida et al. (2010) identify that Senegalese Muslim households in France earn, on average, 400 euros less than their Christian counterparts each month (the equivalent of 14 % of the average monthly household income for France in 2009). See Constant and Zimmermann (2008) and Bisin et al. (2011b) for further evidence on the relationship between low assimilation and poor economic performance in Europe.

<sup>51</sup> Adida et al. (2010) confirm that significant anti-Muslim discrimination prevails in the French labor market. They compare the rate of interview callbacks received by two French applicants of Senegalese background showing the same educational and work experience but differing on religion, with a similar experimental design as in Bertrand and Mullainathan (2004). They confirm that the Muslim applicant faces high prejudice in France in 2009: she is 2.5 times less likely to receive a callback for an interview than is her Christian counterpart.

<sup>52</sup> Our experimental results clearly show that rooted French players do not expect SM to be less cooperative than SX. However, rooted French more exposed to contact with minorities, like recruiters, may hold correct beliefs. Relying on 400 interviews with human resources managers in large French firms, Bouzar and Bouzar (2010) indeed show that H.R. personnel report partly conditioning their hiring decisions (this is at least a post facto rationalization of such decisions) on their beliefs about what Muslims will do to the esprit de corps of their work teams. Perception of Muslims' higher attachment to their religion and culture of origin is listed among the factors underlying their preferences for non-Muslims over Muslims.

paper by Price and Wolfers in 2007 (but published in 2010) documenting that personal fouls are relatively more likely to be called against NBA basketball players when they are officiated by an opposite-race refereeing crew. Pope et al. (2011) show that this media coverage durably erased racial bias by referees. Their finding suggests that making public academic research on discrimination, like the one provided in this paper, could bring about meaningful change in religious discriminatory behavior, especially among the French, who aspire in their republican ideology to treat all citizens equally. On the other hand, Muslims can collectively reveal a commitment to assimilate. One route would be to encourage them to do as many aspiring immigrant groups do around the world, that is, to give French-sounding first names to their children. While the rooted French (if distaste remains) are then likely to seek other clues for Muslim identity, this might serve the Muslim community well as a transitional tactic to induce an equilibrium shift. When it comes to social norms, equilibrium shifts are not trivial to induce (see Mackie 1996), but this paper suggests that this is the challenge France faces in light of a harmful and potentially dangerous discriminatory equilibrium.

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## References

- Adida CL, Laitin DD, Valfort M-A (2010) Identifying barriers to Muslim integration in France. *Proc Natl Acad Sci* 107(52):384–390
- Adida CL, Laitin DD, Valfort M-A (2014) Gender norms, Muslim immigrants, and economic integration in France. *Econ Polit* 26(1):79–95
- Adida CL, Laitin DD, Valfort M-A (2012) One Muslim is enough! Evidence from a field experiment in France. Working paper
- Adida CL, Laitin DD, Valfort M-A (2013) Region of origin or religion? Understanding why immigrants from Muslim-majority countries are discriminated against in Western Europe. Working paper
- Akerlof GA, Kranton RE (2000) Economics and identity. *Q J Econ* 115(3):715–753
- Aleksynska M (2011) Civic participation of immigrants in Europe: assimilation, origin, and destination country effects. *Eur J Polit Econ* 27(3):566–585
- Algan Y, Hémet C, Laitin DD (2012) Diversity and local public goods: a natural experiment with exogenous residential allocation. Working paper
- Allport G (1954) *The nature of prejudice*. Doubleday, New York
- Arrow KJ (1972) Some mathematical models of race discrimination in the labor market. In: Pascal AH (ed) *Racial discrimination in economic life*. D.C. Heath, Lexington, pp 187–204
- Arrow KJ (1998) What has economics to say about racial discrimination. *J Econ Perspect* 12(2):91–100
- Asante MK (2009) Serer. In: Asante MK, Mazama A (eds) *Encyclopedia of African religion*. Sage, Thousand Oaks
- Ashraf N, Bohnet I, Piankov N (2006) Decomposing trust and trustworthiness. *Exp Econ* 9(3):193–208
- Austen-Smith D, Fryer RG (2005) An economic analysis of acting White. *Q J Econ* 120(2):551–583

- Axelrod R (1984) *The evolution of cooperation*. Basic Books, New York
- Becker G (1957) *The economics of discrimination*. University of Chicago Press, Chicago
- Berg EL, Ruth W (2009) *Cultures of the world: Senegal*. Benchmark Books, New York
- Berg J, Dickhaut J, McCabe K (1995) Trust, reciprocity and social history. *Games Econ Behav* 10(1):122–142
- Bertrand M, Mullainathan S (2004) Are Emily and Greg more employable than Lakisha and Jamal? *Am Econ Rev* 94(4):991–1013
- Bisin A, Patacchini E, Verdier TA, Zenou Y (2008) Are Muslim immigrants different in terms of cultural integration? *J Eur Econ Assoc* 6(2-3):445–456
- Bisin A, Patacchini E, Verdier TA, Zenou Y (2011a) Errata corrige are Muslim immigrants different in terms of cultural integration? *J Eur Econ Assoc* 9(5):1012–1019
- Bisin A, Patacchini E, Verdier TA, Zenou Y (2011b) Immigrants and the labour market. *Econ Policy* 26(65):57–92
- Bisin A, Patacchini E, Verdier TA, Zenou Y (2011c) Formation and persistence of oppositional identities. *Eur Econ Rev* 55(8):1046–1071
- Blalock HM (1967) *Toward a theory of minority-group relations*. Capricorn Books, New York
- Bouzar D, Bouzar L (2009) *Allah a-t-il sa place dans l'entreprise?* Albin Michel, Paris
- Caldwell C (2009) *Reflections on the revolution in Europe: immigration, Islam, and the West*. Doubleday, New York
- Camerer CF (2003) *Behavioral game theory*. Princeton University Press, Princeton
- Canot-Brown W (2009) Jola. In: Asante MK, Mazama A (eds) *Encyclopedia of African religion*. Sage, Thousand Oaks
- Constant AF, Zimmermann KF (2008) Measuring ethnic identity and its impact on economic behavior. *J Eur Econ Assoc* 6(2-3):424–433
- Constant AF, Gataullina L, Zimmermann KF (2009) Ethnosing immigrants. *J Econ Behav Org* 69(3):274–287
- Cox JC (2004) How to identify trust and reciprocity. *Games Econ Behav* 46(2):260–281
- Davila A, Mora M (2005) Changes in the earnings of Arab men in the US between 2000 and 2002. *J Popul Econ* 18(4):587–601
- Dustmann C (1996) The social assimilation of immigrants. *J Popul Econ* 9(1):37–54
- Diop AM (1988) Stéréotypes et stratégies. In: Leveau R, Kepel G (eds) *Les Musulmans dans la société française*. Presses de la Fondation Nationale des Sciences Politiques, Paris, pp 77–98
- Eckel CC, Wilson RK (2004) Is trust a risky decision? *J Econ Behav Org* 55(4):447–465
- Eckel CC, Wilson RK (2006) Judging a book by its cover: beauty and expectations in the trust game. *Polit Res Q* 59(2):189–202
- Eguia JX (2012) *Discrimination and assimilation*. Working paper
- Fang H, Loury GC (2005) Dysfunctional identities can be rational. *Am Econ Rev* 95(2):104–111
- Fershtman C, Gneezy U (2001) Discrimination in a segmented society: an experimental approach. *Q J Econ* 116(1):351–377
- Fordham S, Ogbu JU (1986) Black students' school successes: coping with the burden of acting white. *Urban Rev* 18(3):176–206
- Fordham S (1996) *Blacked out: dilemmas of race, identity and the success at capital high*. University of Chicago Press
- Fryer RG (2009) An empirical analysis of acting white. *J Public Econ* 94(56):380–396
- Gastellu J-M (1981) *L'égalitarisme économique des Serer du Sénégal*. ORSTOM, Paris
- Georgiadis A, Manning A (2011) Change and continuity among minority communities in Britain. *J Popul Econ* 24(2):541–568
- Gorinas C (2014) Ethnic identity, majority norms, and the native-immigrant employment gap. *J Popul Econ* 27(1):225–250
- Gould ED, Klor EF (2012) The long-run effect of 9/11: terrorism, backlash, and assimilation of Muslim immigrants in the West. Working paper
- Harrison GW, List JA (2004) Field experiments. *J Econ Lit* 42(4):1009–1055
- Hertwig R, Ortmann A (2001) Experimental practices in economics: a methodological challenge for psychologists? *Behav Brain Sci* 24(3):383–403
- Jacquemet N, Yannellis C (2012) Indiscriminate discrimination: a correspondence test for ethnic homophily in the Chicago labor market. *Labour Econ* 19(6):824–832

- Jamison J, Karlan D, Schechter L (2008) To deceive or not to deceive: the effect of deception on behavior in future laboratory experiments. *J Econ Behav Org* 68(3-4):477–488
- Kahneman D, Knetsch JL, Thaler RH (1986) Fairness and the assumptions of economics. *J Bus* 59(4):285–300
- Laitin DD (1995) Marginality: a microperspective. *Ration Soc* 7(1):31–57
- Linares O (1992) Power, prayer and production: the Jola of Casamance, Senegal. Cambridge University Press, Cambridge
- Mackie G (1996) Ending footbinding and infibulation: a convention account. *Am Soc Rev* 61(6):999–1017
- Manning A, Roy S (2010) Culture clash or culture club? National identity in Britain. *Econ J* 120(542):F72–F100
- McWhorter JH (2000) *Losing the race: self-sabotage in black America*. Free, New York
- Mecham Q (2006) *From the sacred to the state: institutional origins of Islamist political mobilization*. PhD Dissertation, Stanford University
- Paluck EL, Green DP (2009) Prejudice reduction: what works? A critical look at evidence from the field and the laboratory. *Annu Rev Psychol* 60:339–367
- Pew Research Center Report (2011) *The future of the global Muslim population. Projections for 2010–2030*
- Pope D, Price J, Wolfers J (2011) Awareness reduces racial bias. Working paper
- Price J, Wolfers J (2010) Racial discrimination among NBA referees. *Q J Econ* 125(4):1859–1887
- Riphahn RT (2003) Cohort effects in the educational attainment of second generation immigrants in Germany: an analysis of census data. *J Popul Econ* 16(4):711–737
- Schelling TC (1960) *The strategy of conflict*. Harvard University Press, Cambridge
- Shields MA, Price SW (2002) The English language fluency and occupational success of ethnic minority immigrant men living in English metropolitan areas. *J Popul Econ* 15(1):137–160
- Smith E (2010) *Des arts de faire société: parentés à plaisanteries et constructions identitaires en Afrique de l’Ouest (Sénégal)*, Doctorat de Science Politique. Institut d’Etudes Politiques de Paris
- Trivers RL (1971) The evolution of reciprocal altruism. *Q Rev Biol* 46(1):35–57
- van Ours JC, Veenman J (2003) The educational attainment of second-generation immigrants in The Netherlands. *J Popul Econ* 16(4):739–753