"One Muslim is Enough!" Evidence from a Field Experiment in France*

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Abstract

Anti-Muslim prejudice is widespread in Western countries. Yet, Muslims are expected to constitute a growing share of the total population in these countries over the next decades. This paper predicts that this demographic trend, other factors held constant, will increase anti-Muslim prejudice. Relying on experimental games and a formal model, we show that the generosity of rooted French toward Muslims is significantly decreased with the increase of Muslims in their midst, and demonstrate that these results are driven by the activation of rooted French taste-based discrimination against Muslims when Muslim numbers increase. Our findings call for solutions to anti-Muslim prejudice in the West.

Keywords: Discrimination, Islam, France, Group salience, Experimental economics, Economic theory, Group threat theory, Intergroup contact theory.

JEL: A12, C90, D03, J15, J71, Z12.

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When there's one [Muslim],
that's ok; it's when there's a lot
of them that there are problems.

Brice Hortefeux, Former French
Minister of Interior.[i]

1 Introduction

On January 20, 2011, Baroness Sayeed Warsi, the first Muslim woman to serve in the British cabinet, argued that prejudice against Muslims is seen by many people in the UK as normal and uncontroversial, and that "Islamophobia has now passed the dinner table test."[1] Distressingly, anti-Muslim prejudice is not specific to the UK. Despite their virtually complete secularization in the past century, European states, all of them with a historical Christian heritage, are considered to have a special problem with Islam going back to the fall of Constantinople to the Ottomans and the reconquest of Spain in the 15th century. The post-WWII immigration wave that has laid the foundation for today's European Muslim population, has further exacerbated this prejudice. In recent years, a chain of international events has led to ever increasing attention to Islam and Muslims in public discussion not only in Europe, but also in the US. The impact of September 11 seems decisive. In the US, Davila and Mora (2005) and Kaushal, Kaestner, and Reimers (2007) find that, subsequent to that attack, Middle Eastern Arabs (and Afghan, Iranian, and Pakistani men in particular) experienced a significant decline in earnings.

Despite this context of widespread anti-Muslim prejudice, Muslim populations are expected to constitute a growing share of the total population in Western countries over the next decades, through continued migration and higher-than-average fertility rates among

[i]This remark was uttered in French during a photo-op on September 5, 2009 at the UMP (the "Union for a Popular Movement", the centre-right political party in France led by Nicolas Sarkozy) Summer School in Seignosse, in which the Minister was interacting with a young militant, Hamid. Brice Hortefeux joked before the statement in the epigraph that this militant, who was known to be Muslim, "does not correspond at all to the prototype" after having been told that the militant eats pork and drinks beer. The video of this interaction, procured by Le Monde, was uploaded at `http://www.dailymotion.com/video/xafz5w_le-derapage-de-brice-hortefeux-la-h`, and we downloaded it on September 24, 2010. Translated from the French by the authors.

[1]This remark was uttered at the University of Leicester. Excerpts from the speech are available at `http://www.bbc.co.uk/blogs/worldhaveyoursay/2011/01/has_prejudice_against_muslims.html`. We accessed this website on September 1, 2011.

Muslims. According to the Pew Research Center (2011), the Muslim share of the population in Europe as a whole is expected to grow by nearly one-third over the next 20 years, rising from 6% of the region's inhabitants in 2010 to 8% in 2030. In the US, also reported by Pew, the population projections show the number of Muslims more than doubling over the next two decades, leading the US to host a larger number of Muslims by 2030 than all European countries save for Russia and France. Given these demographic trends, how will anti-Muslim prejudice evolve? For instance, will rooted Westerners be less generous toward Muslims as the salience (in terms of their percentage in the population) of this out-group increases?

The objective of this paper is twofold. First, we want to understand how anti-Muslim prejudice in Western countries will evolve with Muslim out-group salience over the next decades. To do so, we rely on experimental games that we conducted in France in 2009.[2] Our games bring together rooted French (whom we designate as FFF hereafter)[3] and a set of immigrants.[4] These immigrants belong to two ethno-linguistic groups in Senegal, the Joolas and the Serers that 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 ethno-linguistic groups are similar. They share the same culture and migrated to France in the same time period.[5] The goal of this experiment is to compare the effect of SM out-group salience on rooted French generosity toward SM with the effect of SX out-group salience on rooted French generosity toward SX. To achieve this goal, we organize a dictator game,[6] played

[2]Technically, and relying on the taxonomy of 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. Henceforth, for economy of expression, we call our intervention a "field experiment".

[3]By rooted French or FFF, we refer to French citizens with four grandparents born inside metropolitan France (strictly speaking, FFF stands for "French citizens of France-born parents and of France-born grandparents"). We identify this set in order to maximally differentiate French citizens with no recent immigrant background (FFF) from those of recent migration to France.

[4]In France, the term "immigrants" refers only to those permanently and legally residing in France who were born abroad. In this paper, we use the term much more broadly, viz., to refer to all residents in France who were born outside the EU, who moved to France after World War II, and their descendants.

[5]Focus on these Senegalese Muslims solves an identification problem that would have been impossible if the focus were on the principal Muslim immigrant group in France, viz. the North Africans, as there is no matched set of North African Christians to whom North African Muslims could be compared. We recognize that our identification strategy, fully elaborated in Adida, Laitin and Valfort (2010), poses a challenge to external validity. However, this is precisely the trade-off that comes naturally from a research design seeking to establish internal validity in identifying the Muslim effect, separate from a region-of-origin effect. Moreover, since sub-Saharan Africans are less readily associated with Islam than are North Africans in France (Diop (1988)), as we discuss later, the effects we estimate in this experiment are likely to be underestimates of the marginal discriminatory effects faced by Muslims in France.

[6]The dictator game was introduced by Kahneman, Knetsch and Thaler (1986). It is a two-person game in which player 1, called the "donor", has to decide what share $s \in [0, 1]$ of an amount of money normalized

communally, and vary exogenously the ethno-religious composition of the player-set across the game sessions by manipulating the number of SM and SX in each game session (see Fershtman and Gneezy (2001) for a previous use of the dictator game in an ethnically diverse setting). We then compare the impact of increasing numbers of SM players on the amount given by rooted French donors to SM recipients, with the impact of increasing numbers of SX players on the amount given by rooted French donors to SX recipients. Our results reveal that FFF generosity toward SM is significantly decreased with SM out-group salience, in a way that is not matched by the impact of SX out-group salience on FFF generosity toward SX.[7] We portray this result as the *Hortefeux effect* (see the epigraph) to the extent that the presence of one additional SM is enough to undermine FFF generosity toward SM recipients. Moreover, we find that FFF correctly believe that the impact of SM out-group salience on FFF generosity toward SM recipients is significantly more negative than the impact of SX out-group salience on FFF generosity toward SX recipients. This finding suggests that the appearance of FFF discriminatory behavior toward Muslims with increasing Muslim out-group salience is common knowledge among rooted French, such that Brice Hortefeux, the former French Minister of Interior, could refer to the negative consequences of Muslim out-group salience in an unguarded way.[8]

What accounts for the decrease in FFF generosity toward Muslims with increasing Muslim out-group salience? Understanding the mechanism underlying the Hortefeux effect constitutes the second objective of this paper.[9] To do so, we develop a rational model augmented with well-behaved other-regarding preferences as in Andreoni and Miller (2002). This model offers two possible explanations for the Hortefeux effect. First, the decrease in FFF generosity toward Muslims when Muslim numbers increase may be a response to a change in the

to 1 he gives to player 2, called the "recipient." For a given share s, the monetary payoff of player 1 and of player 2 is given by $x_1 = 1 - s$ and $x_2 = s$ respectively. The dictator game provides compelling evidence for other-regarding preferences challenging the *homo oeconomicus* postulate, which predicts that the donor should not give anything of his initial endowment to the recipient. Indeed, Forsythe, Horowitz and Sefton (1994) show that 80% of their subjects choose to give a strictly positive share of their initial endowment, with 20% choosing to divide this endowment equally. Reviewing eleven results from dictator games, Camerer (2003) reveals the generality of this finding, as the mean offer ranges from 10% to 52%.

[7] In fact, we find that FFF generosity toward SX *increases* with SX out-group salience, though this result is not robustly significant. Readers may also be interested to learn that neither SM generosity toward FFF nor SX generosity toward FFF is impacted by FFF out-group salience.

[8] Common knowledge is technically defined as the fact that "everyone knows, everyone knows that everyone knows..., everyone knows that everyone knows that everyone knows..., and so on" (Chwe (2001), 9-10). By definition, this knowledge criterion cannot be observed. Here we use the term more conventionally, to mean that our subjects know that other people know what they know.

[9] Samuelson (2005) recommends exploiting experimental results in order to improve our understanding of the mechanisms underlying individuals' behavior, thereby allowing the development of economic theories that yield higher predictive power.

total donation received by Muslims from non-FFF donors when Muslim numbers increase. In particular, this decrease may result from a change in the individual behavior of non-FFF (and notably Muslim) donors when Muslim numbers increase. For instance, FFF can be less generous toward Muslims with Muslim out-group salience if, in that context, Muslims are more generous toward each other and/or less generous toward FFF. In the former case, FFF will free-ride on Muslims' in-group generosity. In the latter case, FFF will compensate members of their in-group for Muslims' lower generosity toward FFF, thereby lowering their generosity toward Muslims. Second, the decrease in FFF generosity toward Muslims when Muslim numbers increase may result from changes in FFF preferences and notably from the activation of FFF taste-based discrimination against Muslims when FFF are surrounded by Muslims. In that context, the positive weight that FFF assign to the well-being of Muslims is a decreasing function of the relative size of the Muslim minority. Our results show that the decrease in FFF generosity toward Muslims when Muslim numbers increase is not due to a change in the total donations received by Muslims from non-FFF donors when Muslim numbers increase. In particular, we find that FFF are the *only* donors in the dictator game to change their donations when Muslim numbers increase. Notably, SM donors do not change their donations with Muslim out-group salience. From our rational model and these data, we infer that the Hortefeux effect derives from an activation of FFF distaste toward Muslims with Muslim out-group salience. This finding echoes the results by Echenique and Fryer (2007) who show, based on US data, that black students tend to be integrated when they are relatively few in a school, but that their segregation increases dramatically as their share of the student population increases. Moreover, this finding relates to research by Card, Mas and Rothstein (2008) and Boustan (2010) who provide evidence of a "white flight" during the post-war period in the US, a process by which white families left central city neighborhoods to avoid living in majority-black cities. Finally, this finding is in line with Schneider (2008) who shows, based on the European Social Survey, that the perception by Europeans of a symbolic, rather than actual, threat accounts for the increase in Europeans' anti-immigrant attitudes when the relative size of the immigrant community increases. Our results have ominous societal implications and point to the urgency of finding solutions to taste-based discrimination against Muslims.

This paper contributes to two strands of the literature on discrimination. The first strand theorizes the mechanisms linking attitudes toward the out-group and out-group relative size. Two theories oppose each other. Intergroup contact theory predicts that an

increase in the relative size of the minority provides contact opportunities with the minority, which in turn attenuates prejudice by the dominant group against members of the minority (Allport (1954)). Group threat theory predicts that an increase in the relative size of the minority generates hostile attitudes by the dominant group toward the minority, either because of increased competition over tangible scarce resources or because of the perception by the dominant group of a symbolic threat (which we call "distaste") to one's cultural integrity (Blalock (1967)). This paper allows us to test intergroup contact theory against group threat theory. By increasing the number of Muslims in the game sessions, we give an opportunity for both theories to shape individual behavior: an increase in the number of Muslims increases opportunities for interaction and contact; but it also introduces the prospect of a Muslim threat. If contact theory dominates, we should observe a decrease in FFF taste-based discrimination equally toward Muslims and Christians. If group threat theory dominates, we should instead observe an increasing divergence between the group seen as the threat and the group that is non-threatening. Our findings show that the latter wins out: the behavior we observe toward the Muslim minority is consistent with group threat theory rather than intergroup contact theory. Moreover, this paper identifies the mechanism behind group threat theory: the perception by the dominant group of a symbolic threat, not actual threatening behavior by the minority, accounts for the discriminatory behavior by the dominant group against that minority.

The second strand puts these theoretical mechanisms to test. Several scholars have found the relationship between the salience of the minority and attitudes toward the minority to be statistically insignificant.[10] Yet others identify a significant effect that generally points to an increase in negative attitudes toward the out-group when the out-group becomes more salient.[11] Only a few studies have analyzed the relationship between Muslim out-group salience and anti-Muslim prejudice. Those that do also point to an increase in anti-Muslim prejudice in geographic areas where Muslim out-group size is higher. Bowyer (2009) shows that residential proximity in the UK to Pakistanis and Bangladeshis, who are primarily Muslim, is associated with more negative attitudes towards ethnic minorities. Similarly, relying on survey data, Savelkoul, Scheepers, Tolsma and Hagendoorn (2010) find that Mus-

[10]See Strabac and Listhaug (2008) for Europe; Hjerm (2007) for Sweden; Citrin and Sides (2008) for Europe and the US.

[11]See Scheepers, Gijsberts and Coenders (2002), Schneider (2008), Gorodzeisky and Semyonov (2009) for Europe; Dustmann and Preston (2001) for the UK; Krueger and Pischke (1997) for Germany; Schlueter, Schmidt and Wagner (2008) for Germany and Russia; Schlueter and Scheepers (2010) for the Netherlands; Taylor (1998), Echenique and Fryer (2007), Card, Mas and Rothstein (2008) and Boustan (2010) for the US.

lim out-group size is related to anti-Muslim attitudes by rooted Dutch. We complement these approaches in several ways. We take advantage of having a control group of SX who differ from SM only by religion. And so, by comparing changes in attitudes of Westerners toward Muslim and toward matched Christian immigrants when the relative size of each group increases, we isolate a Muslim effect from possible confounds such as race, ethnicity, or nationality. Furthermore, by relying on experimental games bringing together FFF, SM, and SX, we improve upon previous survey-based studies[12] with an analysis that looks directly at discriminatory behaviors. Finally, by exogenously varying the ethno-religious composition of the player-set across the game sessions, we overcome the simultaneity bias that typically[13] contaminates studies investigating the relationship between demographic context and attitudes toward migrants: racially intolerant individuals from the majority community are indeed unlikely to choose to live in areas with large ethnic minority populations (see Alesina, Baqir and Easterly (1999) for a discussion of this Tiebout-like sorting).

The paper proceeds as follows. In Section 2, we introduce our experimental setup. In Section 3, we present our experimental results, including the Hortefeux effect. In Section 4, we develop a rational model augmented with other-regarding preferences to explain the behavior of FFF donors in the dictator game. We then run an empirical test showing that the Hortefeux effect derives from an activation of rooted French taste-based discrimination against Muslims with Muslim out-group salience. Section 5 provides robustness checks. Section 6 summarizes our major conclusions and discusses their implications for the integration of Muslim immigrants into Western societies.

2 Experimental set up

In this section, we present our subject pool, our treatment (i.e.: the exogenous variation of the ethno-religious composition of the player-sets across the game sessions) and the dictator game that allows us to analyze the impact of Muslim out-group salience on rooted French generosity.[14]

[12]The previous studies are all based on self-reported attitudinal measures, with the exception of Krueger and Pischke (1997) (who analyze the relationship between crime against foreigners and the relative number of foreigners) and of Card, Mas and Rothstein (2008) and Boustan (2010) (who rely on Census tract data).

[13]Dustmann and Preston (2001), Card, Mas and Rothstein (2008), Boustan (2010) and Hopkins (2010) are exceptions.

[14]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,

2.1 The subject pool

In March 2009, we set up a series of experimental games between FFF, SM and SX. We recruited 27 Senegalese players: 16 self-identified as Muslims (SM) and 11 as Christians (SX).[15] 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 1 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 the robustness check section by controlling for the average socioeconomic characteristics of the SM and SX players in the game session and notably their religiosity (our results are robust to the inclusion of such controls).[16]

It is important to note 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: the discriminatory effects of being Muslim for Maghrebis, the Muslims who are at the center of public debate 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 the effects of being a Muslim from Senegal.

To complement our game sessions, we also recruited 53 non-Senegalese players. The ethno-religious breakdown of these 53 non-Senegalese players was as follows. First, 29 play-

Josselin Thuilliez and Severine Toussaert.

[15]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.

[16]Note that this bias runs against us finding a negative effect of SM out-group salience on FFF generosity toward SM since SM participants are more moderate in their religious practices.

ers, among whom 21 FFF, were of European background. We categorize all these 29 players as being of Judeo-Christian background. The 19 players who specified their religion confirmed that they were either Christian (18 players) or Jewish (1 player), while the others (who self-declared as "atheist" or who didn't specify a religious belonging) all had recognizable Judeo-Christian first names: Bertrand, Danièle, Fabien, Florence, Karl, Marine, Rénald, Sophie, Spyro, Yves. Second, 12 players were of African background. We categorize 6 of these 12 players as being of Judeo-Christian background. The 5 players among them who specified their religion confirmed that they were Christians, while the remaining player (who didn't specify a religious belonging) had a recognizable Judeo-Christian first name: Julie. We categorize the other 6 African players as being of Muslim background. The 4 players among them who specified their religion confirmed that they were Muslims. As for the 2 players who didn't specify a religious belonging, one of them was known by our ethnographers to stem from a Muslim family while the other had a recognizable Muslim name: Maïmouna. Finally, 12 players were of North African background. We categorize these 12 players as being of Muslim background. The 9 players who specified their religion confirmed that they were Muslims, while all the others (who self-declared as "atheist" or who didn't specify a religious belonging) had recognizable Muslim first names: Jalal, Nabil, Reza.

We recruited these players using a stratified (by population density) but not always fully random recruitment procedure centered on the 21 metro stations in the ethnically diverse setting of the 19th district of Paris.[17] 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 passer-by 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. Passers-by 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 game participation,[18] games which were designed to investigate "how people from Ile-de-France

[17] 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 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) that received the Palme d'Or at the 2008 Cannes Film Festival.

[18] This stands for roughly 8.5 times the hourly minimum wage in France as of 2009.

[Parisian region] make decisions about money."

Turn-downs were about 30 percent, 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 sample of French respondents to 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 sub-sample 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 2 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 3. 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 leads to an underestimation of anti-Muslim discrimination on the part of FFF.

2.2 The treatment

The experiment comprised two phases: a registration phase, during which we collected demographic and behavioral data that we later used for the composition of the player-sets; and a game phase, during which subjects played a series of experimental games.[19] We supervised eight sessions of games 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. 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 solution that worked: in the exit surveys for the experiments, not a single subject speculated that religion had anything to do with the purposes of the games,[20] and only one of the Senegalese players out of a total 27 verbally wondered if there was something odd about having other players in the room who were from his Senegalese language group.

Each session was comprised of ten players. Based on information learned at registration, subjects were assigned to a session so as to satisfy three criteria. First, in order to obtain statistical power, all sessions needed at least two FFF-SM and one FFF-SX interactions, or the reverse. Second, we needed to "treat" our game sessions properly. We did so by exogenously varying the ethno-religious composition (and notably the number of SM and SX) of our game sessions, meaning that players were assigned to a game session without them knowing its ethno-religious composition. This approach allows us to capture the effect of out-group salience, by comparing the change in FFF generosity toward SM when the number of SM increases, with the change in FFF generosity toward SX when the number of SX increases. Table 4 specifies the ethno-religious composition of each session, by distinguishing between players of European (Judeo-Christian) background, players of African (Judeo-Christian) background, players of African (Muslim) background, and players of North African (Muslim)

[19] 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 two 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. Our success strategy was revealed in our exit questionnaires, which asked participants what they thought our team had learned about them throughout the games: only 1 respondent out of a total 80 mentioned religion.

[20] 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?]

background. The number of SM varies from 1 (in sessions 1 and 7) to 3 (in sessions 5 and 8), while the number of SX varies from 1 (in sessions 1, 3, 4, 5, 7) to 2 (in sessions 2, 6 and 8).[21] Third, to test the effect of mixed gender versus non mixed gender sessions in a subsequent paper, we supervised three all male sessions, three all female sessions and two mixed gender sessions.

2.3 The dictator game

We answer our main research question on the impact of Muslim out-group salience on FFF generosity with data collected from our 2009 dictator game. 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.

The 2009 dictator game took place after the group of ten had played a series of simultaneous trust games;[22] a speed-chatting game in which all players got to meet five other players in four-minute conversations, as in a speed-dating scenario; and a voting game in which each speed-chatting group member elected, among the group of players he or she had just met, a leader who would then distribute funds to his/her electorate at his/her discretion.[23] Therefore, by the start of the dictator game, all ten players already knew a good deal of information about one another, especially due to the speed chatting game.[24] However, at

[21]The fact that the number of SM varies from 1 to 3, while the number of SX varies from 1 to 2, introduces a concern: could the Hortefeux effect derive from the fact that FFF exposure to SM out-group salience means an exposure to 3 Senegalese Muslims, while FFF exposure to SX out-group salience means an exposure to 2 Senegalese Christians? In our results section we address this concern and show that the Hortefeux effect is not driven by this asymmetry.

[22]The simultaneous trust game is described in Appendix A1.

[23]We analyze these other games in separate papers.

[24]For the speed chatting game, our ten players were placed into two teams of 5, each following the same protocol. Each player on a team was instructed that he/she would have a few minutes to meet (and we emphasized, to get to know) each member of the other team, thereby "speed chatting" with five other players, sequentially, as in a speed-dating situation. After meeting each partner, players were given 1 minute to jot down notes on a piece of paper. After meeting all members of the other group, each player received a sheet of paper with the picture of each person he or she had just met, and a series of eight personal questions about them (their age, their religion, their job, whether they had obtained their Baccalauréat (the French high-school diploma), the country in which they were born, the district in which they live, whether they are married and their favorite hobby). Players were allowed to consult their notes. For each question, subjects

no time did any of our players know the game decisions of any of the other players in their session.[25]

Our experimental setup for the dictator game was the only one to bring together all players in a single room – hence guaranteeing the activation of group salience effects. All players (whom we refer to as donors) were shown the same set of six partners (whom we call recipients) on a large screen revealing only their faces and ascribed first names, which we strategically altered as is commonly done in correspondence tests conducted by economists (see Bertrand and Mullainathan (2004)). More precisely, among the six recipients, two were apparent FFF with Christian names, two were ambiguous with alternatively Muslim and Christian names, such that donors could reasonably think they were FFF with Christian names or North Africans with Muslim names, and two were apparent black Africans. These last two, a Senegalese man and a Senegalese woman, were the recipients of interest for this analysis. For half of the sessions, subjects viewed one of the ambiguous recipients and one of the Senegalese recipients with a Christian name, and the other ambiguous recipient as well as the other Senegalese recipient with a Muslim name; for the other half of the sessions, this was reversed. By doing so, we avoid any confound between the ethnic type of the recipient and the face of the recipient, notably when we analyze the amount given by FFF donors to Senegalese recipients. Put differently, the fact that FFF donors see the same Senegalese face with alternated religious identities (one Christian, the other Muslim) allows us to run a within-face analysis. Figure 1 illustrates the faces and alternating names of our recipients in the dictator game.

It is important to note that the four non-Senegalese recipients were recruited in the 19th district of Paris in a similar way as the donors (while the Senegalese recipients, in order to assure ourselves that they would not be recognized by our Senegalese donors, were not residents of Ile de France). None of the recipients ever participated in our game sessions, and none was ever known personally by any of the donors. The donors saw the sequence of

provided their answer, or selected "don't know", and indicated whether they learned this information from their chat, or simply guessed the answer. For each correct answer, subjects earned 1 euro.

[25]There is a potential concern here with contamination effects of previous games on players' behavior during the dictator game, especially if players learned about other players' game decisions during the speed chatting game. Such contamination is highly unlikely. During our initial presentation of the experiments, 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" – their speed-chatting partners, meaning that players were instructed to find out information about who their partners were, 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.

recipients only once and were asked to make a decision to allocate $a = \{0, 1, 2, 3, 4, 5\}$ euros to each recipient - out of 5 euros allotted to them each time, being assured that the amounts accruing to each recipient would actually be transferred to them. Donors were handed an answer sheet and provided with enough room to record their decisions in a private manner, albeit in a public space. Although recipients appeared sequentially on the screen, donors could observe the entire set of recipients (with their ascribed first names) on their answer sheet as they recorded their allocation decisions.

3 Experimental results

The dictator game was played after a socialization phase afforded by the speed chatting game. Prior to this socialization phase, Adida, Laitin and Valfort (2011) find that SM experience discrimination by FFF. Notably, holding the number of SM and SX in the game session at its average, FFF show taste-based discrimination against SM; i.e. they are less generous toward SM than toward SX.[26] In this section, we first test whether, holding the number of SM and SX in the game session at its average, FFF donors show a taste for discrimination toward SM recipients they have never met before (the recipients on the screen), or whether this taste-based discrimination is (at least temporarily), as would be predicted by contact theory, erased subsequent to FFF-SM interactions during the speed-chatting game. We then test for the Hortefeux effect, that is we investigate whether FFF generosity toward SM is decreased by SM out-group salience in a way that is not matched by the impact of SX out-group salience on FFF generosity toward SX. Finally, we test whether the Hortefeux effect is common knowledge among FFF. More precisely, we investigate whether FFF believe that the impact of SM out-group salience on FFF generosity toward SM recipients is significantly more negative than the impact of SX out-group salience on FFF generosity toward SX recipients.

[26] Two issues arise here. How do we elicit FFF lower generosity toward SM prior to the socialization phase? And how do we know this discrimination is not based on beliefs by FFF on the neediness of the recipients? We will address these two issues systematically in other papers, but see Appendix A1 and Appendix A2 for summaries of our interventions allowing us to infer FFF taste-based discrimination against SM.

3.1 FFF generosity toward SM, holding the number of SM at its average

We estimate equation (1) over the set of pairs composed of FFF donors and SM and SX recipients:

$$y = a + b.(\text{FFF} \rightarrow \text{SM}) + \mathbf{c}'.\mathbf{X} + d.\text{Face} + \mathbf{e}'.\mathbf{\Pi} + \epsilon, \quad (1)$$

where y refers to the amount given by the donors to the recipients in the dictator game. The dummy (FFF $\rightarrow$ SM) is equal to 1 if the donor is FFF and the recipient is SM and to 0 if the donor is FFF and the recipient is SX. As a consequence, coefficient b captures the difference between the amount given by FFF donors to SM recipients and the amount given by FFF donors to SX recipients. We also control for a vector of socioeconomic characteristics of FFF donors denoted $\mathbf{X}$. This vector contains information on the gender, age, household income, education and religiosity of FFF players, as well as on whether they know players who participated in previous game sessions. 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). To hold the number of Muslims and matched Christians in the game session at its average, we introduce $\mathbf{\Pi}$, a vector of session fixed effects. Finally, standard errors are clustered at the donor level since donations from the same donor cannot be considered as independent of one other. Note that our results are robust if we cluster the standard errors at the session level instead.

Table 5 presents OLS estimates from three model specifications of equation (1). In column 1, we control for the ethno-religious identity of the donor and of the recipient (i.e.: we control for the dummy (FFF $\rightarrow$ SM)), as well as for session fixed effects. In column 2, we add face fixed effects. In column 3, we include the socioeconomic characteristics of FFF donors. The non significant coefficient of the dummy (FFF $\rightarrow$ SM) in all three columns suggests that FFF donors do not treat SM and SX recipients differently when one holds the number of SM and SX in the game session at its average. It may be that the socialization phase that preceded the dictator game erased FFF taste-based discrimination against all SM, whether or not they interacted with any particular SM during the speed-chatting game. This finding gives partial support to contact theory.

If socialization indeed reduces FFF taste-based discrimination against all SM, the anonymous CV,[27] which gives equal likelihood of obtaining a job interview to applications that

[27] In an anonymous CV, the candidates' first and last names, nationality, sex, age and e-mail address are hidden from the recruiter during the selection process before an interview.

are comparable in training, experience and skills would be the obvious remedy to the discrimination SM face in the French labour market (as reported in Adida, Laitin and Valfort (2010)).[28] If job interviews replicate the effects of the socialization phase introduced in our experiments, eliminating obstacles to obtaining a job interview could help level the playing field.

3.2 FFF generosity toward SM when SM numbers increase

Holding the number of SM and SX in the game session at its average, FFF donors are as generous toward SM recipients as they are toward SX recipients. Relying on difference-of-means tests, Tables 6 through 9 present useful descriptive statistics that provide basic intuitions about whether this result holds once the number of SM and SX in the game session varies. In Table 6, we find that a marginal increase in the number of SM, holding the number of SX constant at 1, decreases FFF donations to SM recipients monotonically from 2.83 euros in sessions with 1 SM to 1.60 euros in sessions with 2 SM to 0.75 euros in sessions with 3 SM, while FFF donations to SX recipients evolve non monotonically. In Table 7, the marginal increase in the number of SM, holding constant the number of SX at 2, again yields a decrease in FFF donations toward SM. By contrast, Tables 8 and 9 indicate inconsistent patterns of FFF generosity toward SX when the number of SX increases, holding constant the number of SM. These difference-of-means tests bring to light a consistent discriminatory reaction toward SM recipients on the part of FFF donors as SM numbers increase but no consistent change in FFF behavior toward SX with SX group salience.

Careful scrutiny of the data permits two observations. First, the decrease in FFF generosity toward SM recipients with SM out-group salience is not due to a few outliers. Figure 2 provides the distribution of FFF donations to SM recipients when the number of SM increases, holding the number of SX equal to its median value (1 SX). It appears clearly that all FFF donors, not a few of them, take an active part in the decrease in FFF donations to SM recipients when the number of SM reaches its maximum (3 SM) in the game session.

[28] Adida, Laitin and Valfort (2010) 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. Moreover, through a high-n survey conducted in France among Christian and Muslim households of Senegalese background, the authors find that Muslim households earn, on average, 400 euros less than Christian households each month (the equivalent of 14% of the average monthly household income for France in 2009). This income effect is consistent with the discrimination observed in the French labor market.

Second, the decrease in FFF donations to SM recipients when the number of SM increases is not due to sessions with 3 SM only. As emphasized below in footnote 29, the Hortefeux effect holds when we exclude those sessions.

In Table 10, we run a regression analysis estimating equation (2) over the set of pairs composed of FFF donors and SM and SX recipients:

$$\begin{aligned} y &= a + b.(\text{FFF} \rightarrow \text{SM}) + c.(\text{FFF} \rightarrow \text{SM}).\text{nbSM} + d.(\text{FFF} \rightarrow \text{SM}).\text{nbSX} \\ &\quad + e.\text{nbSM} + f.\text{nbSX} + \mathbf{g}'.\mathbf{X} + h.\text{Face} + \epsilon, \end{aligned} \tag{2}$$

where y refers to the amount given by the donors to the recipients in the dictator game. The dummy (FFF $\rightarrow$ SM) is equal to 1 if the donor is FFF and the recipient is SM and to 0 if the donor is FFF and the recipient is SX. The variables nbSM and nbSX stand for the number of SM and SX players, respectively, in the session. As a consequence, coefficient b captures the difference between the amount given by FFF donors to SM recipients and the amount given by FFF donors to SX recipients when there are no SM and no SX in the game session. The impact of one additional SM in the room on FFF donations to SM recipients is given by the sum of coefficients c and e. The impact of one additional SX in the room on FFF donations to SX recipients is captured by coefficient f. We address the possibility that FFF participating in sessions with high numbers of SM (SX) systematically differ from FFF participating in sessions with low numbers of SM (SX), by introducing controls for observable individual socioeconomic characteristics (gender, age, education, household income, religiosity and whether they know players who participated in previous game sessions) that are denoted by $\mathbf{X}$. Additionally, in order to run a within-face analysis, we introduce the dummy Face that is again equal to 1 if the recipient is the Senegalese woman (and 0 if the recipient is the Senegalese man). Finally, standard errors are clustered at the donor level since donations from the same donor cannot be considered independent of one another. Note that our results are robust if we cluster the standard errors at the session level instead.

Table 10, relying on OLS estimates of equation (2), reports results from three model specifications. In column 1, we control for the ethno-religious identity of the donor and of the recipient, for the number of SM and SX in the game session, as well as for the interactions between these two sets of variables. In column 2, we add the Face dummy in order to run a within-face analysis. In column 3, we include the socioeconomic characteristics of FFF donors. Our results first show that, in all three columns, having one more SM in the room significantly decreases FFF donations to SM recipients, as revealed by the sum of

the coefficients c and e that appear in rows (2) and (4) in Table 10 (see the p-value of the first Wald test reported at the bottom of Table 10). Second, we observe that the impact of having one more SX in the room on FFF donations to SX recipients is positive, though not robustly significant, as shown by the coefficient f that appears in row (5) in Table 10. Third, the p-value of the last Wald test reported at the bottom of Table 10 indicates that the difference between these two impacts is strongly significant across all model specifications, confirming our main result that FFF generosity toward SM recipients is decreased by SM out-group salience in a way that is not matched by the impact of SX out-group salience on FFF generosity toward SX.[29]

This finding suggests that, in the context of the French labor market, the expected discrimination-reducing impact of the anonymous CV would typically be subverted with more than one Muslim interviewee or even with more than one Muslim employee already in the hiring firm. Indeed, increasing numbers of Muslims in the workforce will activate discrimination among the rooted French employers and therefore lower the chances of Muslim applicants being hired (compared to matched Christian applicants).

3.3 FFF beliefs about other FFF generosity toward SM when SM numbers increase

Is the Hortefeux effect common knowledge? Do FFF believe that the impact of SM out-group salience on FFF generosity toward SM recipients is significantly more negative than the impact of SX out-group salience on FFF generosity toward SX recipients? To answer this question, we rely on the strategic dictator game which immediately followed the dictator game we have been analyzing so far. The strategic dictator game consisted in asking players to guess the amount one of the FFF players (though not advertised as such) had allocated to each of the recipients in the dictator game. Players were also told that the one who guessed closest to the actual decisions of this FFF model would receive a prize of 30 euros. The

[29] We address the concern that the Hortefeux effect might be driven by an asymmetry between SM out-group salience (going from 1 to 3 SM) and SX out-group salience (going from 1 to 2 SX). First, Table 6, columns (a) and (b) indicate that FFF donations to SM when SM numbers increase from 1 to 2 decrease from 2.83 euros to 1.60 euros, a substantively large though not significant effect (p=0.15). Therefore, the pattern that characterizes the Hortefeux effect holds when SM out-group salience is limited to an increase from 1 to 2 SM. Second, Table 9 suggests that including cases where the number of SM in the session is equal to 3 might actually work against finding an Hortefeux effect. Indeed, FFF donations to SX, when SX out-group salience increases and when the number of SM in the session is equal to 3, *decrease* from 2.50 euros to 2 euros. Finally, we re-run the analysis in Table 10, excluding sessions where the number of SM is equal to 3. This reduces our power from 42 to 30 observations. We find that our substantive results hold, though their statistical significance weakens.

strategic dictator game therefore helps us determine FFF beliefs about FFF generosity for different levels of SM and SX out-group salience.

More precisely, we estimate equation (3) over the set of triads composed of FFF guessers, FFF donors, and SM and SX recipients:

$$\begin{aligned} y \;=\; & a + b.(\text{FFF} \rightsquigarrow \text{FFF} \rightarrow \text{SM}) \\ & + c.(\text{FFF} \rightsquigarrow \text{FFF} \rightarrow \text{SM}).\text{nbSM} + d.(\text{FFF} \rightsquigarrow \text{FFF} \rightarrow \text{SM}).\text{nbSX} \\ & + e.\text{nbSM} + f.\text{nbSX} + \mathbf{g}'.\mathbf{X} + h.\text{Face} + \epsilon, \end{aligned} \tag{3}$$

where y refers to FFF guesses about other FFF donations to SM and SX recipients. The dummy (FFF $\rightsquigarrow$ FFF $\rightarrow$ SM) is equal to 1 if the guesser is FFF, the donor is FFF and the recipient is SM and to 0 if the guesser is FFF, the donor is FFF and the recipient is SX. The variables nbSM and nbSX again stand for the number of SM and SX players, respectively, in the session. As a consequence, coefficient b captures the difference between FFF guesses about other FFF donations to SM recipients and FFF guesses about other FFF donations to SX recipients when there are no SM and no SX donors in the game session. The impact of one additional SM in the room on FFF guesses about other FFF donations to SM recipients is given by the sum of coefficients c and e. The impact of one additional SX in the room on FFF guesses about other FFF donations to SX recipients is captured by coefficient f. We control for a series of socioeconomic characteristics of FFF guessers (gender, age, education, household income, religiosity and whether they know players who participated in previous game sessions) that are denoted by $\mathbf{X}$. Additionally, in order to run a within-face analysis, we introduce the Face dummy that is again equal to 1 if the recipient is the Senegalese woman and 0 if the recipient is the Senegalese man. Finally, standard errors are clustered at the guesser level since guesses from the same guesser cannot be considered as independent of one other. Note that our results are robust if we cluster the standard errors at the session level instead.

OLS estimates of equation (3) are presented in Table 11 which reports results from the three model specifications already presented in Table 10. First, we draw the reader's attention to coefficient f in row (5), which indicates across all model specifications that FFF believe other FFF are significantly more generous to SX when the number of SX increases. Second, we examine the effect of SM out-group salience on FFF beliefs about FFF donations to SM recipients (the sum of coefficients c and e that appear in rows (2) and (4) respectively).

This effect is negative (although not significantly so). Third, the Wald test reported at the bottom of the table indicates that the difference between these two effects is strongly significant across all model specifications. Overall, these results indicate that FFF correctly believe that the impact of SM out-group salience on FFF generosity toward SM recipients is significantly more negative than the impact of SX out-group salience on FFF generosity toward SX recipients. The fact that the Hortefeux effect is common knowledge may provide implicit justification for all FFF to act in conformity with the expected prejudicial behavior of in-group members with an increase in the size of the Muslim out-group. In other words, FFF may consider discriminatory behavior toward Muslims in an environment with several Muslims around them as normal – so normal that former Minister Hortefeux could state it in a self-assured and unreflective manner.

This finding helps us further account for anti-Muslim discrimination in the French labor market. It highlights the fact that even a French employer who has no case against any particular Muslim will have a clear economic interest in favoring Christian applicants over matched Muslim applicants. Our results indeed suggest that an FFF employer would anticipate that an open employment policy would activate discriminatory behavior among his firm's employees and customers, thereby threatening the *esprit de corps* within the company as well as the comfort of its FFF customers.

4 Change in the total donation received by SM from non-FFF or change in FFF preferences?

Understanding the mechanism underlying the Hortefeux effect constitutes the second objective of this paper. In this section, we develop a rational model augmented with other-regarding preferences to better understand the behavior of FFF donors in the dictator game. This model differentiates between two mechanisms: the decrease in FFF generosity toward Muslims when Muslim numbers increase may be a response to a change in the total donation received by Muslims from non-FFF donors when Muslim numbers increase; it may also result from changes in FFF preferences and notably from the activation of FFF taste-based discrimination against Muslims when FFF are surrounded by Muslims. We run an empirical test to identify which of these two mechanisms (or both) is (are) at work.

4.1 A rational model to account for FFF donors' behavior

Let us consider the following objective function of a FFF donor:

$$U = u(c, \omega_1\theta_1, ..., \omega_4\theta_4),$$

where u is increasing with respect to all its arguments, and concave. The first argument c stands for the consumption of the FFF donor and is given by $c = R - \sum_{j=1}^{j=4} y_j$ where R is the total endowment received by the FFF donor in the dictator game and y_j stands for the donation of the FFF donor to the recipient of ethno-religious type j. As shown in Figure 1, each game session is characterized by 6 recipients who are of 4 different ethno-religious types: 3 are FFF, 1 is SM, 1 is SX and 1 is (Muslim) North African. For the sake of simplicity and without loss of generality, we assume in this model that there are as many recipients as there are ethno-religious types, hence 4 recipients. In the other arguments of function u, ω_j $(j = 1, ..., 4)$ stands for the weight that the FFF donor assigns to the consumption of the recipient of ethno-religious type j. The consumption of the recipient of ethno-religious type j is given by $\theta_j = y_j + Y_j + Z_j$, where Y_j refers to the donations of all other FFF donors to the recipient of ethno-religious type j, while Z_j refers to the donations of all other non-FFF donors to the recipient of ethno-religious type j.

In what follows, we analyze the optimal behavior of FFF donors when the donations of non-FFF donors are given. Consistent with our experimental setup where players are not allowed to communicate with each other, we assume that FFF donors play non cooperatively. More precisely, each FFF donor chooses the vector of donations $\mathbf{y} = (y_1, y_2, y_3, y_4)$. For each FFF donor, the first order condition for the optimal choice of $\mathbf{y}$ is given by

$$-\frac{\partial u(\cdot)}{\partial c} + \omega_j \frac{\partial u(\cdot)}{\partial(\omega_j\theta_j)} = 0, j = 1, .., 4. \tag{4}$$

Let us restrict the analysis to the case of a unique and symmetric equilibrium (i.e.: an equilibrium where all FFF donors make the same donations). Thus $\theta_j = Ny_j + Z_j$, where N represents the number of FFF donors. In that setting, equation (4) shows that $\mathbf{y}$ will change with an increase in the number of SM if $\mathbf{Z} = (Z_1, ..., Z_4)$ changes, meaning that changes in FFF behaviors are a response to changes in the total donation received by some of the recipients (and notably SM recipients) from non-FFF donors when SM numbers increase. More precisely, the Hortefeux effect can emerge if the total donation received by SM recipients from non-FFF donors changes with SM group salience. In particular, we can observe the

Hortefeux effect if non-FFF donors (and notably SM donors) change their individual behavior when SM numbers increase. For instance, if SM intra-group generosity increases with SM group salience, FFF donors might want to free-ride on SM donors' generosity toward SM recipients with SM group salience. Similarly, if SM generosity toward FFF recipients decreases with SM group salience, FFF donors might want to compensate FFF recipients (and therefore give less to SM recipients) with SM out-group salience.

Alternatively, the Hortefeux effect can emerge if the positive weight that FFF donors assign to the well-being of SM recipients is a decreasing function of the relative size of the SM minority. As equation (4) shows, $\mathbf{y}$ can also change with an increase in the number of SM if $\mathbf{\Omega} = (\omega_1, ..., \omega_4)$ changes.[30]

4.2 An empirical test to identify the mechanism at work

Does the Hortefeux effect emerge because FFF donors respond to changes in the total donation received by some of the recipients (and notably SM recipients) from non-FFF donors when SM numbers increase, or because FFF donors assign a lower weight to the well-being of SM recipients when SM number increase? To rule out the possibility that changes in FFF behavior are a response to changes in the total donation received by some of the recipients from non-FFF donors, it suffices to show that, controlling for the number of SX in the game session:

$$\frac{\mathrm{d}Z_j}{\mathrm{d}N_{SM}} = 0 \text{ for all } j,$$

where N_{SM} stands for the number of SM in the game session.

Let us test whether this sufficient condition holds, that is whether the total donation received from non-FFF donors by each of the four ethno-religious types of recipients is

[30]Note that these predictions rely on the assumption that equilibrium $\mathbf{y}$ is unique. If this assumption is relaxed, then changes in FFF behaviors with an increase in the number of SM could simply stem from the fact that FFF donors coordinate on a different equilibrium when SM numbers increase (as compared to the equilibrium they play when there are fewer SM around them). More precisely, if several equilibria exist, the Hortefeux effect can emerge because FFF donors coordinate on the equilibrium "giving less to SM recipients" when SM numbers increase. This situation makes sense in the case of strategic complementarity between FFF donors. Mathematically, strategic complementarity between FFF donors implies that:

$$\frac{\mathrm{d}^2 u(\cdot)}{\mathrm{d}y_j \mathrm{d}Y_j} = -\omega_j \frac{\partial^2 u(\cdot)}{\partial c \partial(\omega_j \theta_j)} + \omega_j^2 \frac{\partial^2 u(\cdot)}{\partial^2(\omega_j \theta_j)} > 0. \tag{5}$$

The concavity of u implies that $\frac{\partial^2 u(\cdot)}{\partial^2(\omega_j \theta_j)} < 0$. Inequality (5) can therefore be satisfied only with an unrealistic condition: *viz.*, if $\frac{\partial^2 u(\cdot)}{\partial c \partial(\omega_j \theta_j)} < 0$, that is if the marginal utility of consumption of the FFF donor decreases with the donations received by the recipient of ethno-religious type j.

unaffected by the number of SM in the game session. To do so, we estimate equation (6):

$$\begin{aligned} y \;=\; & a + b.(\text{non-FFF} \rightarrow \text{SM}) + c.(\text{non-FFF} \rightarrow \text{SM}).\text{nbSM} + d.(\text{non-FFF} \rightarrow \text{SM}).\text{nbSX} \\ & + e.(\text{non-FFF} \rightarrow \text{FFF}) + f.(\text{non-FFF} \rightarrow \text{FFF}).\text{nbSM} + g.(\text{non-FFF} \rightarrow \text{FFF}).\text{nbSX} \\ & + h.(\text{non-FFF} \rightarrow \text{NA}) + i.(\text{non-FFF} \rightarrow \text{NA}).\text{nbSM} + j.(\text{non-FFF} \rightarrow \text{NA}).\text{nbSX} \\ & + k.\text{nbSM} + l.\text{nbSX} + \epsilon, \end{aligned} \tag{6}$$

where y refers to the total per session donation received by the recipients from non-FFF donors, meaning that the unit of observation in this equation is the recipient. The dummy (non-FFF $\rightarrow$ SM) is equal to 1 if the recipient is SM, and to 0 otherwise. The dummy (non-FFF $\rightarrow$ FFF) is equal to 1 if the recipient is FFF, and to 0 otherwise. The dummy (non-FFF $\rightarrow$ NA) is equal to 1 if the recipient is North African, and to 0 otherwise.

The total per session donation received by SX recipients from non-FFF donors when there are no SM and no SX donors in the session is the reference category. Therefore, coefficient b captures the difference between the total donation received by SM recipients from non-FFF donors and the total donation received by SX recipients from non-FFF donors, when there are no SM and no SX donors in the game session; coefficient e captures the difference between the total donation received by FFF recipients from non-FFF donors and the total donation received by SX recipients from non-FFF donors, when there are no SM and no SX donors in the game session; coefficient h captures the difference between the total donation received by North-African recipients from non-FFF donors and the total donation received by SX recipients from non-FFF donors, when there are no SM and no SX donors in the game session.

The variables nbSM and nbSX stand for the number of SM and SX players, respectively, in the game session. Therefore, the marginal impact of one additional SM in the room on the total donation received by SM recipients from non-FFF donors (as compared to the total donation received by SM recipients from non-FFF donors when there are no SM and no SX donors in the session) is given by the sum of coefficients c and k; the marginal impact of one additional SM in the room on the total donation received by FFF recipients from non-FFF donors (as compared to the total donation received by FFF recipients from non-FFF donors when there are no SM and no SX donors in the session) is given by the sum of coefficients f and k; the marginal impact of one additional SM in the room on the total donation received by North African recipients from non-FFF donors (as compared to the

total donation received by North African recipients from non-FFF donors when there are no SM and no SX donors in the session) is given by the sum of coefficients i and k; the marginal impact of one additional SM in the room on the total donation received by SX recipients from non-FFF donors (as compared to the total donation received by SX recipients from non-FFF donors when there are no SM and no SX donors in the session) is given by coefficient k. Finally, standard errors are clustered at the session level.

Table 12 presents the OLS estimates of equation (6). The p-values of the Wald tests reported at the bottom of Table 12 show that the total donation received by each of the four ethno-religious types of recipients from non-FFF donors is not impacted by the number of SM in the game session. In other words, the Hortefeux effect is not a response of FFF donors to changes in the total donation received by some of the recipients (and notably SM recipients) from non-FFF donors when SM numbers increase.

More specifically, if one estimates equation (6) by defining y as the amount given by each non-FFF donor to the recipients in the dictator game (meaning that the unit of observation is not the recipient anymore, but the dyad formed by a non-FFF donor and a recipient), one finds that non-FFF donors do not change their individual behavior when SM numbers increase. Table 13 presents results from three model specifications for OLS estimates of this new equation, where the standard errors are clustered at the donor level (note that our results are robust if we cluster the standard errors at the session level instead). In column 1, we control for the ethno-religious identity of the donor and of the recipient, for the number of SM and SX in the game session, as well as for the interactions between these two sets of variables. In column 2, we include the socioeconomic characteristics of non-FFF donors. Since this inclusion generates a reduction in the sample size from 354 observations to 294 observations due to missing values for the income, education and religiosity of some of the non-FFF donors, we run a multiple imputation analysis in column 3. The p-values of the Wald tests reported at the bottom of Table 13 show that the amount given by non-FFF donors to each of the four ethno-religious types of recipients is not impacted by the number of SM in the game session.

Put differently, FFF donors are the only donors in the dictator game to change their behavior when Muslim numbers increase. They therefore do not respond to changes in the individual behavior of non-FFF donors with SM out-group salience. Notably, the Hortefeux effect does not emerge because SM intra-group generosity increases with SM group salience (see the table in Appendix A3 which shows that SM in-group generosity in fact *decreases* with

SM group salience, though this result is not robustly significant). Neither does the Hortefeux effect emerge because SM generosity toward FFF recipients decreases with SM group salience (see the table in Appendix A4 which shows that the impact of SM out-group salience on SM generosity toward FFF recipients is neither consistent nor robustly significant). As a consequence, relying on equation (4), the Hortefeux effect can only emerge because SM out-group salience has an impact on $\mathbf{\Omega}$, the vector of weights that FFF donors assign to the consumption of the different ethno-religious types of recipients. More precisely, the Hortefeux effect derives from an activation of FFF stinginess toward Muslims with Muslim out-group salience.

Note that one could object that the Hortefeux effect arises because FFF donors wrongly anticipate that the total donation received by some of the recipients (and notably SM recipients) from non-FFF donors changes when Muslim numbers increase. Unfortunately, we do not have data on FFF beliefs about these total donations during our games. However, we offer a piece of evidence to suggest that FFF behavior is not a result of FFF mistaken beliefs. Recall that our results in section 3.3 indicate that FFF correctly guessed the Hortefeux effect among their fellow FFF. We therefore know that FFF make correct guesses when it comes to their fellow FFF. Using results from our speed-chatting game, we can now show that FFF are just as good at guessing information about non-FFF as they are about their fellow FFF. We previously described the speed-chatting game as a game designed for our players to "get to know one another". Immediately after the speed-chatting game, players were tested on how well they got to know their partners. Players received a sheet of paper with a picture and a series of eight personal questions for each of the partners they had just met. For each question, players provided their answer and indicated whether they had learned the information from their chat or simply guessed the answer. If we analyze the percentage of correctly guessed answers for FFF subjects, we can estimate whether FFF guess just as well for their non-FFF partners as they do for their FFF partners. This is precisely what our results show.[31] This analysis increases our confidence that the Hortefeux effect is not due to mistaken beliefs on the part of FFF.

[31] Results are available upon request.

5 Robustness checks

Two factors could challenge our results. First, even though Senegalese players were exogenously assigned to sessions – and thus could not have self-selected into sessions comprised of a greater number of their co-ethnics – it could still be the case (due solely to bad luck) that systematic differences characterize the SM (SX) participating in sessions with higher numbers of SM (SX) from those participating in sessions with lower numbers of SM (SX). It is therefore necessary to test whether our results are robust to controls for the average socioeconomic characteristics of the SM and SX players in the game session and notably for their average gender composition, age, education, household income, religiosity and answer to whether they know players from previous sessions. Second, the number of SM and the number of SX in the session is not necessarily independent of the number of non-SM players of Muslim background and of non-SX players of Christian background respectively. To rule out the possibility that SM and SX out-group salience simply captures the effect of the group salience of these other players, we must test whether our results are robust to controls for the distribution of these other players in the game session. In this section, we implement these two robustness checks for each of our three main results: (i) the Hortefeux effect; (ii) FFF beliefs that the impact of SM out-group salience on FFF generosity toward SM recipients is significantly more negative than the impact of SX out-group salience on FFF generosity toward SX recipients; and (iii) the unchanged total donation received by each of the four ethno-religious type of recipients from non-FFF donors when SM numbers increase.

5.1 The Hortefeux effect

Is the Hortefeux effect robust to controls for the average socioeconomic characteristics of SM and SX players and for the out-group salience of other players of Muslim and Christian backgrounds? Results from our robustness checks are reported in Table 14. In columns 1 to 6, we control for the average gender composition, age, education, household income, religiosity and answer to whether they know players from previous sessions respectively. In column 7, we control for the out-group salience of other players of Muslim and Christian backgrounds. More precisely, column 7 provides the OLS estimates for the following version

of equation (2):

$$\begin{aligned} y &= a + b.(\text{FFF} \rightarrow \text{SM}) + c.(\text{FFF} \rightarrow \text{SM}).\text{nbSM} + d.(\text{FFF} \rightarrow \text{SM}).\text{nbSX} + e.\text{nbSM} + f.\text{nbSX} \\ &\quad + \mathbf{g}'.\mathbf{X} + h.Face + i.(\text{FFF} \rightarrow \text{SM}).\text{nbOTHMUS} + j.\text{nbOTHMUS} + \epsilon, \end{aligned}$$

where the variable nbOTHMUS stands for the number of other players of Muslim background. As a consequence, coefficient b captures the difference between the amount given by FFF donors to SM recipients and the amount given by FFF donors to SX recipients with no SX and no Muslim players in the game session.

The Hortefeux effect is robust to the control for the average socioeconomic characteristics of SM and SX players in each game session and to the control for the effect of the out-group salience of other players of Muslim and Christian backgrounds. Having one more SM in the room significantly decreases FFF donations to SM recipients.[32] This is revealed by the sum of the coefficients c and e that appear in rows (2) and (4) in Table 14 (see the p-value of the first Wald test reported at the bottom of Table 14). Coefficient f in row (5) in Table 14 indicates that the impact of having one more SX in the room on FFF donations to SX recipients is positive but not always significant. The p-value of the last Wald test reported at the bottom of Table 14 indicates that the difference between these two impacts is strongly significant in all specifications, confirming our main result that FFF generosity toward SM recipients is decreased by SM out-group salience in a way that is not matched by the impact of SX out-group salience on FFF generosity toward SX.

5.2 The Hortefeux effect as common knowledge

Is the Hortefeux effect still common knowledge among rooted French when we control for the average socioeconomic characteristics of SM and SX players and for the out-group salience of other players of Muslim and Christian backgrounds? Results from our robustness checks are reported in Table 15. We again find support for FFF believing that the impact of SM out-group salience on other FFF generosity toward SM recipients is more negative than the impact of SX out-group salience on other FFF generosity toward SX recipients in all specifications. The difference between these two impacts is strongly significant. The only exceptions are the specifications controlling for the average education and the average religiosity of SM and SX (the p-value of the last Wald test reported at the bottom of Table

[32]The specification in column 6 that controls for the average answer of SM and SX to the "know past players" question is an exception: the decrease is not significant there.

15 is, however, close to statistical significance: it is equal to 0.12 and 0.15 in column 3 and column 5 respectively).

5.3 The unchanged total donation received from non-FFF donors when SM numbers increase

Is the total donation received by each of the four ethno-religious types of recipients from non-FFF donors still unaffected by SM out-group salience when we control for the average socioeconomic characteristics of SM and SX players and for the out-group salience of other players of Muslim and Christian backgrounds? Results from our robustness checks are reported in Table 16. The p-values of the Wald tests reported at the bottom of Table 16 confirm that the total donation received by each of the four ethno-religious types of recipients from non-FFF donors is never impacted by the number of SM in the game session.

6 Conclusion

This paper relies on an identification strategy that allows us to estimate the impact of religious difference on discriminatory behavior, and experimental games bringing together rooted French and a set of immigrants differing only by religion. We report that a socialization phase in the experimental protocol has a discernible effect in reducing anti-Muslim behavior, giving limited support for contact theory. However, we further find that rooted French generosity toward Muslims is significantly decreased with Muslim out-group salience. No such result is obtained with the impact of out-group salience on rooted French generosity toward matched Christians. We portray this result on Muslim out-group salience as the Hortefeux effect – referring to the French Minister of Interior who articulated the challenge of increased Muslim presence in France in an impromptu setting – revealing the conditions under which group threat theory erases the gains coming from individual contact. Moreover, we find that the Hortefeux effect is common knowledge among the rooted French population, and consequently a normal form of behavior. Finally, based on a rational model and an empirical test of the mechanisms this model uncovers, we identify that the Hortefeux effect derives from an activation of taste-based discrimination by rooted French against Muslims when Muslim numbers increase.

Our determination in addressing issues of internal validity so that we could isolate the micro-foundations of religious discrimination in France sets limits to any direct policy impli-

cation. For example, in our games, the fraction of SM moves by nearly threefold from 1/10 of the participants to 3/10. In the real world, as estimated by Pew Research (2011), the proportion of Muslims in France will increase from 7.5% in 2010 to 10.3% in 2030, indeed a much less dramatic increase.

Nonetheless, our findings are useful for providing perspective on the handicap faced by Muslims today and evaluating its likely evolution in the next decades, not only in France but also in other Western countries provided our results hold there as well.[33] First, the simple expectation that the presence of several Muslim employees exacerbates discomfort among the rooted workforce and customers motivates any recruiter, even if she has no case against any particular Muslim, to screen out Muslim applicants, effectively discriminating on the basis of perceived religion.[34] Second, all else equal, anti-Muslim prejudice will increase in the future with the predicted growing share of Muslim immigrants in Western countries, potentially becoming a source of deeper social tensions. Of course, future research must address the external validity issues; but this paper provides a set of expectations based on well-specified micro-foundations.

Our findings echo the results reported by Echenique and Fryer (2007), Card, Mas and Rothstein (2008) and Boustan (2010). The results in all these papers are indeed consistent with the mechanisms that we identify here, viz. the activation of taste-based discrimination of the majority against the minority when the relative size of the minority increases. Once identified, however, solutions are not obvious; Paluck and Green's extensive review of the literature (2009) underlines the ineffectiveness of many prejudice-reducing policies. More optimistically, Pope, Price and Wolfers (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 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, Price and Wolfers (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.

[33] We intend to replicate our experimental setup in a number of European countries.

[34] Our findings also offer an explanation for religious discrimination that might exist in other markets that are critical for successful economic integration of immigrants, such as the housing and marriage markets.

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Tables and Figures

Table 1: Socioeconomic characteristics of SM and SX participants in our 2009 experiments. Difference of means analysis.

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

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

Table 2: 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

Notes: 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."

Table 3: 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***	0.522***	0.517***	0.473**	0.447**
	(0.177)	(0.176)	(0.179)	(0.191)	(0.198)
(2) Female		0.063	0.054	0.046	-0.007
		(0.183)	(0.202)	(0.203)	(0.211)
(3) Age			0.001	-0.001	0.000
			(0.006)	(0.006)	(0.007)
(4) Education				-0.093	-0.050
				(0.105)	(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

Notes: The table reports OLS estimates. The unit of observation is the individual. The dependent variable is categorical. It 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" is a dummy that takes the value 1 if the individual is a respondent to the 2009 ESS, and the value 0 if she is a participant in our 2009 experiments. "Female" is a dummy that takes the value 1 if the individual is female and the value 0 otherwise. "Age" is equal to the age of the individual. "Education" is a categorical variable that ranges from 1 (less than lower secondary completed) to 4 (post secondary completed). "Household income" is a categorical variable that ranges from 1 (first quintile) to 5 (fifth quintile). Standard errors are robust. *, ** and *** indicate significance at the 10, 5 and 1% levels.

Table 4: Variations in the ethno-religious composition of player-sets across game sessions.

	S1	S2	S3	S4	S5	S6	S7	S8
Players of European and Judeo-Christian background	**4**	**3**	**2**	**3**	**5**	**5**	**4**	**3**
Among which FFF	*4*	*2*	*2*	*3*	*4*	*2*	*2*	*2*
Players of African and Judeo-Christian background	**2**	**4**	**2**	**2**	**1**	**2**	**2**	**2**
Among which SX	*1*	*2*	*1*	*1*	*1*	*2*	*1*	*2*
Players of African and Muslim background	**2**	**2**	**2**	**2**	**4**	**3**	**3**	**4**
Among which SM	*1*	*2*	*2*	*2*	*3*	*2*	*1*	*3*
Players of North African and Muslim background	**2**	**1**	**4**	**3**	**0**	**0**	**1**	**1**

Figure 1: Variations in the ethno-religious identity of the recipients in the dictator game.

First name	Version 1	Sylvie	Georges	Khadija	Jean-Marc	Farida	Michel
	Version 2	Sylvie	Mohammed	Joséphine	Jean-Marc	Christine	Aboubacar
Ethnicity/ Religion	Version 1	FFF	FFF	SM	FFF	Muslim North African	SX
	Version 2	FFF	Muslim North African	SX	FFF	FFF	SM

Table 5: FFF generosity toward SM and SX recipients, holding the number of SM and SX at their averages. OLS analysis.

	Dep. var.: FFF donations to SM and SX		
	(1)	(2)	(3)
(1) FFF → SM	0.286	0.389	0.389
	(0.378)	(0.328)	(0.364)
(2) Female			2.304***
			(0.707)
(3) Age			0.008
			(0.013)
(4) Education			0.089
			(0.246)
(5) Household income			-0.188
			(0.135)
(6) Religiosity			0.331
			(0.353)
(7) Knows players from previous sessions			0.214
			(1.336)
Face fixed effects	No	Yes	Yes
Session fixed effects	Yes	Yes	Yes
R^2	0.352	0.427	0.587
Observations	42	42	42

Notes: The table reports OLS estimates. The unit of observation is a dyad formed by a FFF donor and a SM or SX recipient. The dependent variable is categorical. It ranges from 0 (the donor gives nothing to the recipient) to 5 (the donor gives her total endowment to the recipient). "FFF → SM" is a dummy that takes the value 1 if the donor is FFF and the recipient is SM, and the value 0 if the donor is FFF and the recipient is SX. "Female" is a dummy that takes the value 1 if the donor is female and the value 0 otherwise. "Age" is equal to the age of the donor. "Education" is a categorical variable that ranges from 1 (less than primary school completed) to 10 (higher than college degree completed). "Household income" is a categorical variable that ranges from 1 (less than 500 euros monthly) to 11 (more than 7,500 euros monthly). "Religiosity" is a categorical variable that ranges from 1 (never attends religious services) to 7 (attends religious services several times a week). "Knows players from previous sessions" is a dummy that takes the value 1 if the donor knows players who participated in previous game sessions and the value 0 otherwise. The coefficient in row (1) stands for the difference between the amount given by FFF donors to SM recipients and the amount given by FFF donors to SX recipients. Standard errors are clustered at the donor level. *, ** and *** indicate significance at the 10, 5 and 1% levels.

Table 6: Impact of one additional SM on FFF donors' generosity, holding the number of SX equal to 1.

FFF donors' donations	Session with 1 SM (a)	Session with 2 SM (b)	Session with 3 SM (c)	Diff (b-a)	Diff (c-b)	Diff (c-a)
Donations to SM (d)	2.83 (N=6)	1.60 (N=5)	0.75 (N=4)	-1.23 p=0.15	-0.85 p=0.19	-2.08 p=0.02
Donations to SX (e)	2.33 (N=6)	0.80 (N=5)	2.50 (N=4)	-1.53 p=0.02	+1.70 p=0.07	+0.17 p=0.84
Diff (e-d)	-0.50 p=0.51	-0.80 p=0.24	+1.75 p=0.07			

Table 7: Impact of one additional SM on FFF donors' generosity, holding the number of SX equal to 2.

FFF donors' donations	Session with 2 SM (a)	Session with 3 SM (b)	Diff (b-a)
Donations to SM (d)	3.50 (N=4)	3.00 (N=2)	-0.50 p=0.72
Donations to SX (e)	2.50 (N=4)	2.00 (N=2)	-0.50 p=0.71
Diff (e-d)	-1.00 p=0.23	-1.00 p=0.55	

Table 8: Impact of one additional SX on FFF donors' generosity, holding the number of SM equal to 2.

FFF donors' donations	Session with 1 SX (a)	Session with 2 SX (b)	Diff (b-a)
Donations to SM (d)	1.60 (N=5)	3.50 (N=4)	+1.90 p=0.06
Donations to SX (e)	0.80 (N=5)	2.50 (N=4)	+1.70 p=0.01
Diff (e-d)	-0.80 p=0.24	-1.00 p=0.23	

Table 9: Impact of one additional SX on FFF donors' generosity, holding the number of SM equal to 3.

FFF donors' donations	Session with 1 SX (a)	Session with 2 SX (b)	Diff (b-a)
Donations to SM (d)	0.75 (N=4)	3.00 (N=2)	+2.25 p=0.25
Donations to SX (e)	2.50 (N=4)	2.00 (N=2)	-0.50 p=0.72
Diff (e-d)	+1.75 p=0.07	-1.00 p=0.55	

Figure 2: Distribution of FFF donations to SM recipients when the number of SM increases, holding the number of SX equal to 1.

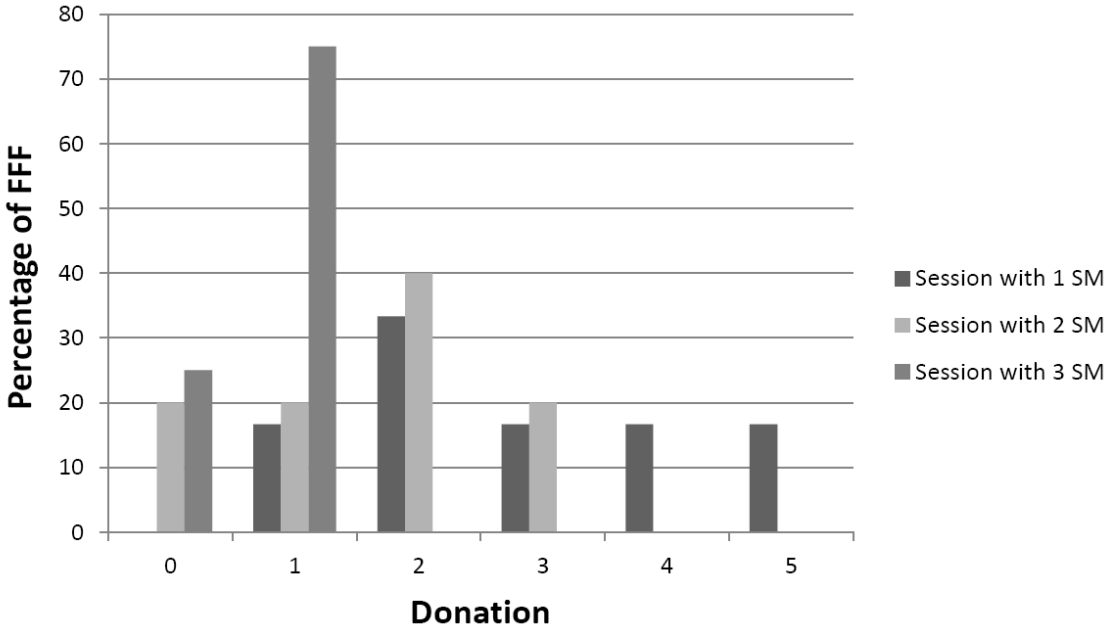

Table 10: FFF generosity toward SM and SX recipients when SM and SX numbers increase. OLS analysis.

	Dep. var.: FFF donations to SM and SX		
	(1)	(2)	(3)
(1) FFF → SM	0.265	2.369*	2.369*
	(1.030)	(1.201)	(1.319)
(2) (FFF → SM)*Number of SM	-0.904**	-0.970**	-0.970**
	(0.416)	(0.388)	(0.427)
(3) (FFF → SM)*Number of SX	1.422*	-0.010	-0.010
	(0.720)	(0.852)	(0.936)
(4) Number of SM	-0.084	-0.051	-0.067
	(0.384)	(0.367)	(0.273)
(5) Number of SX	0.506	1.222**	1.480**
	(0.512)	(0.507)	(0.623)
(6) Female			0.851*
			(0.418)
(7) Age			0.010
			(0.012)
(8) Education			0.151
			(0.202)
(9) Household income			-0.101
			(0.095)
(10) Religiosity			0.346
			(0.301)
(11) Knows players from previous sessions			0.550
			(0.894)
Face fixed effects	No	Yes	Yes
P-value of the Wald test: (2)+(4)=0	0.01	0.01	0.01
P-value of the Wald test: (5)=0	0.33	0.03	0.03
P-value of the Wald test: (2)+(4)=(5)	0.02	0.00	0.00
R^2	0.308	0.364	0.563
Observations	42	42	42

Notes: The table reports OLS estimates. The unit of observation is a dyad formed by a FFF donor and a SM or SX recipient. The dependent variable is categorical. It ranges from 0 (the donor gives nothing to the recipient) to 5 (the donor gives her total endowment to the recipient). "FFF → SM" is a dummy that takes the value 1 if the donor is FFF and the recipient is SM, and the value 0 if the donor is FFF and the recipient is SX. "Number of SM" is equal to the number of SM in the game session. "Number of SX" is equal to the number of SX in the game session. "Female" is a dummy that takes the value 1 if the donor is female and the value 0 otherwise. "Age" is equal to the age of the donor. "Education" is a categorical variable that ranges from 1 (less than primary school completed) to 10 (higher than college degree completed). "Household income" is a categorical variable that ranges from 1 (less than 500 euros monthly) to 11 (more than 7,500 euros monthly). "Religiosity" is a categorical variable that ranges from 1 (never attends religious services) to 7 (attends religious services several times a week). "Knows players from previous sessions" is a dummy that takes the value 1 if the donor knows players who participated in previous game sessions and the value 0 otherwise. The sum of the coefficients in rows (2) and (4) stands for the impact on the amount given by FFF donors to SM recipients when there are no SM and no SX donors in the session, of having one additional SM in the game session. The coefficient in row (5) stands for the impact on the amount given by FFF donors to SX recipients when there are no SM and no SX donors in the session, of having one additional SX in the game session. Standard errors are clustered at the donor level. *, ** and *** indicate significance at the 10, 5 and 1% levels.

Table 11: FFF guesses about other FFF generosity toward SM and SX recipients when SM and SX numbers increase. OLS analysis.

	Dep. var.: FFF guesses about FFF donations to SM and SX		
	(1)	(2)	(3)
(1) FFF $\rightsquigarrow$ FFF $\rightarrow$ SM	0.849	3.447**	3.447**
	(0.878)	(1.485)	(1.632)
(2) (FFF $\rightsquigarrow$ FFF $\rightarrow$ SM)*Number of SM	-0.464	-0.545	-0.545
	(0.360)	(0.318)	(0.350)
(3) (FFF $\rightsquigarrow$ FFF $\rightarrow$ SM)*Number of SX	0.283	-1.485	-1.485
	(0.512)	(0.948)	(1.041)
(4) Number of SM	0.108	0.149	0.254
	(0.416)	(0.387)	(0.298)
(5) Number of SX	1.349**	2.233***	2.780***
	(0.566)	(0.659)	(0.829)
(6) Female			0.997**
			(0.362)
(7) Age			-0.008
			(0.012)
(8) Education			0.023
			(0.215)
(9) Household income			0.018
			(0.086)
(10) Religiosity			0.352
			(0.286)
(11) Knows players from previous sessions			-1.582**
			(0.714)
Face fixed effects	No	Yes	Yes
P-value of the Wald test: (2)+(4)=0	0.33	0.31	0.35
P-value of the Wald test: (5)=0	0.03	0.00	0.00
P-value of the Wald test: (2)+(4)=(5)	0.02	0.00	0.00
R^2	0.269	0.350	0.563
Observations	42	42	42

Notes: The table reports OLS estimates. The unit of observation is a triad formed by a FFF guesser, a FFF donor and a SM or SX recipient. The dependent variable is categorical. It ranges from 0 (the guesser guesses that the donor gives nothing to the recipient) to 5 (the guesser guesses that the donor gives her total endowment to the recipient). "FFF $\rightsquigarrow$ FFF $\rightarrow$ SM" is a dummy that takes the value 1 if the guesser is FFF, the donor is FFF and the recipient is SM, and the value 0 if the guesser is FFF, the donor is FFF and the recipient is SX. "Number of SM" is equal to the number of SM in the game session. "Number of SX" is equal to the number of SX in the game session. "Female" is a dummy that takes the value 1 if the donor is female and the value 0 otherwise. "Age" is equal to the age of the donor. "Education" is a categorical variable that ranges from 1 (less than primary school completed) to 10 (higher than college degree completed). "Household income" is a categorical variable that ranges from 1 (less than 500 euros monthly) to 11 (more than 7,500 euros monthly). "Religiosity" is a categorical variable that ranges from 1 (never attends religious services) to 7 (attends religious services several times a week). "Knows players from previous sessions" is a dummy that takes the value 1 if the donor knows players who participated in previous game sessions and the value 0 otherwise. The sum of the coefficients in rows (2) and (4) stands for the impact on FFF guesses about the amount given by FFF donors to SM recipients when there are no SM and no SX donors in the session, of having one additional SM in the game session. The coefficient in row (5) stands for the impact on on FFF guesses about the amount given by FFF donors to SX recipients when there are no SM and no SX donors in the session, of having one additional SX in the game session. Standard errors are clustered at the guesser level. *, ** and *** indicate significance at the 10, 5 and 1% levels.

Table 12: Total donation received by all ethno-religious types of recipients from non-FFF donors when SM and SX numbers increase. OLS analysis.

	Dep. var.: Total donation received by all recipients from non-FFF donors
(1) non-FFF → SM	-5.865
	(5.769)
(2) (non-FFF → SM)*Number of SM	0.788
	(2.531)
(3) (non-FFF → SM)*Number of SX	2.846
	(3.068)
(4) non-FFF → FFF	-3.808
	(2.983)
(5) (non-FFF → FFF)*Number of SM	0.936
	(1.614)
(6) (non-FFF → FFF)*Number of SX	0.923
	(2.043)
(7) non-FFF → NA	0.519
	(2.720)
(8) (non-FFF → NA)*Number of SM	-0.673
	(0.874)
(9) (non-FFF → NA)*Number of SX	-0.308
	(0.809)
(10) Number of SM	-0.712
	(2.150)
(11) Number of SX	-0.154
	(2.331)
P-value of the Wald test: (2)+(10)=0	0.96
P-value of the Wald test: (5)+(10)=0	0.89
P-value of the Wald test: (8)+(10)=0	0.63
P-value of the Wald test: (10)=0	0.75
R^2	0.069
Observations	48

Notes: The table reports OLS estimates. The unit of observation is the recipient. The dependent variable is categorical. It ranges from 6 to 19. "non-FFF → SM" is a dummy that takes the value 1 if the recipient is SM, and 0 otherwise. "non-FFF → FFF" is a dummy that takes the value 1 if the recipient is FFF, and 0 otherwise. "non-FFF → NA" is a dummy that takes the value 1 if the recipient is North African, and 0 otherwise. "Number of SM" is equal to the number of SM in the game session. "Number of SX" is equal to the number of SX in the game session. The sum of the coefficients in rows (2) and (10) stands for the impact on the total donation received by SM recipients from non-FFF donors when there are no SM and no SX donors in the session, of having one additional SM in the game session. The sum of the coefficients in rows (5) and (10) stands for the impact on the total donation received by FFF recipients from non-FFF donors when there are no SM and no SX donors in the session, of having one additional SM in the game session. The sum of the coefficients in rows (8) and (10) stands for the impact on the total donation received by North African recipients from non-FFF donors, of having one additional SM in the game session. The coefficient in row (10) stands for the impact on the total donation received by SX recipients from non-FFF donors when there are no SM and no SX donors in the session, of having one additional SM in the game session. Standard errors are clustered at the session level. *, ** and *** indicate significance at the 10, 5 and 1% levels.

Table 13: Non-FFF generosity toward all ethno-religious types of recipients when SM and SX numbers increase. OLS analysis.

	Dep. var.: Non-FFF donations to all types of recipients		
	(1)	(2)	(3)
(1) non-FFF → SM	-0.794 (0.607)	-0.605 (0.717)	-0.791 (0.616)
(2) (non-FFF → SM)*Number of SM	0.107 (0.248)	0.252 (0.346)	0.112 (0.252)
(3) (non-FFF → SM)*Number of SX	0.377 (0.333)	0.101 (0.437)	0.370 (0.338)
(4) non-FFF → FFF	-0.529 (0.472)	-0.447 (0.519)	-0.530 (0.476)
(5) (non-FFF → FFF)*Number of SM	0.131 (0.239)	0.243 (0.233)	0.132 (0.241)
(6) (non-FFF → FFF)*Number of SX	0.126 (0.273)	-0.066 (0.233)	0.126 (0.276)
(7) non-FFF → NA	0.050 (0.579)	0.321 (0.655)	0.051 (0.585)
(8) (non-FFF → NA)*Number of SM	-0.105 (0.283)	-0.263 (0.363)	-0.100 (0.287)
(9) (non-FFF → NA)*Number of SX	-0.006 (0.346)	0.054 (0.402)	-0.015 (0.351)
(10) Number of SM	-0.037 (0.272)	-0.008 (0.310)	0.009 (0.241)
(11) Number of SX	-0.246 (0.354)	-0.004 (0.402)	-0.245 (0.351)
(12) Female		0.491** (0.244)	0.354 (0.237)
(13) Age		0.025* (0.013)	0.032** (0.013)
(14) Education		0.112** (0.045)	0.062 (0.047)
(15) Household income		-0.015 (0.060)	0.001 (0.057)
(16) Religiosity		0.069 (0.067)	0.058 (0.058)
(17) Knows players from previous sessions		-0.291 (0.336)	-0.036 (0.275)
Multiple Imputation Analysis	No	No	Yes
P-value of the Wald test: (2)+(10)=0	0.72	0.37	0.55
P-value of the Wald test: (5)+(10)=0	0.64	0.26	0.41
P-value of the Wald test: (8)+(10)=0	0.54	0.28	0.67
P-value of the Wald test: (10)=0	0.89	0.98	0.97
R^2	0.010	0.129	0.102
Observations	354	294	354

Notes: The table reports OLS estimates. The unit of observation is a dyad formed by a non-FFF donor and a recipient. The dependent variable is categorical. It ranges from 0 (the donor gives nothing to the recipient) to 5 (the donor gives her total endowment to the recipient). "non-FFF → SM" is a dummy that takes the value 1 if the donor is non-FFF and the recipient is SM, and 0 otherwise. "non-FFF → FFF" is a dummy that takes the value 1 if the donor is non-FFF and the recipient is FFF, and 0 otherwise. "non-FFF → NA" is a dummy that takes the value 1 if the donor is non-FFF and the recipient is North African, and 0 otherwise. "Number of SM" is equal to the number of SM in the game session. "Number of SX" is equal to the number of SX in the game session. "Female" is a dummy that takes the value 1 if the donor is female and the value 0 otherwise. "Age" is equal to the age of the donor. "Education" is a categorical variable that ranges from 1 (less than primary school completed) to 10 (higher than college degree completed). "Household income" is a categorical variable that ranges from 1 (less than 500 euros monthly) to 11 (more than 7,500 euros monthly). "Religiosity" is a categorical variable that ranges from 1 (never attends religious services) to 7 (attends religious services several times a week). "Knows players from previous sessions" is a dummy that takes the value 1 if the donor knows players who participated in previous game sessions and the value 0 otherwise. The sum of the coefficients in rows (2) and (10) stands for the impact on the amount given by FFF donors to SM recipients when there are no SM and no SX donors in the session, of having one additional SM in the game session. The sum of the coefficients in rows (5) and (10) stands for the impact on the amount given by FFF donors to FFF recipients when there are no SM and no SX donors in the session, of having one additional SM in the game session. The sum of the coefficients in rows (8) and (10) stands for the impact on the amount given by FFF donors to North African recipients when there are no SM and no SX donors in the session, of having one additional SM in the game session. The coefficient in row (10) stands for the impact on the amount given by FFF donors to SX recipients when there are no SM and no SX donors in the session, of having one additional SM in the game session. Standard errors are clustered at the donor level. *, ** and *** indicate significance at the 10, 5 and 1% levels.

Table 14: FFF generosity toward SM and SX recipients when SM and SX numbers increase. Robustness checks.

	Dep. var.: FFF donations to SM and SX						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) FFF → SM	2.369*	2.369*	2.369*	2.369*	2.369*	2.369*	0.075
	(1.367)	(1.367)	(1.367)	(1.367)	(1.367)	(1.367)	(1.590)
(2) (FFF → SM)*Number of SM	-0.970**	-0.970**	-0.970**	-0.970**	-0.970**	-0.970**	-0.680
	(0.442)	(0.442)	(0.442)	(0.442)	(0.442)	(0.442)	(0.434)
(3) (FFF → SM)*Number of SX	-0.010	-0.010	-0.010	-0.010	-0.010	-0.010	0.586
	(0.970)	(0.970)	(0.970)	(0.970)	(0.970)	(0.970)	(0.862)
(4) Number of SM	-0.085	-0.083	0.051	0.078	0.016	-0.239	-0.357
	(0.297)	(0.284)	(0.303)	(0.436)	(0.279)	(1.038)	(0.478)
(5) Number of SX	1.650***	1.080*	1.527	1.380**	0.414	1.506**	0.783
	(0.546)	(0.618)	(1.191)	(0.637)	(0.655)	(0.677)	(1.205)
(6) Female	2.160***	1.124**	0.856	0.824	1.771**	0.892	0.605
	(0.574)	(0.528)	(0.720)	(0.574)	(0.628)	(0.634)	(0.891)
(7) Age	0.005	0.014	0.008	0.010	0.006	0.008	0.010
	(0.013)	(0.010)	(0.013)	(0.014)	(0.013)	(0.014)	(0.012)
(8) Education	0.225	0.117	0.045	0.102	0.087	0.154	0.094
	(0.198)	(0.188)	(0.181)	(0.221)	(0.191)	(0.237)	(0.249)
(9) Household income	-0.159	-0.146	-0.120	-0.089	-0.161	-0.101	-0.111
	(0.111)	(0.119)	(0.113)	(0.113)	(0.116)	(0.099)	(0.108)
(10) Religiosity	0.495*	0.292	0.193	0.264	0.303	0.361	0.269
	(0.275)	(0.243)	(0.245)	(0.339)	(0.245)	(0.372)	(0.332)
(11) Knows players from previous sessions	-0.215	0.887	1.287	0.467	0.669	0.512	1.200
	(1.111)	(0.941)	(1.345)	(0.977)	(1.033)	(1.075)	(1.981)
Face fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Average gender of SM and SX	Yes	No	No	No	No	No	No
Average age of SM and SX	No	Yes	No	No	No	No	No
Average education of SM and SX	No	No	Yes	No	No	No	No
Average household income of SM and SX	No	No	No	Yes	No	No	No
Average religiosity of SM and SX	No	No	No	No	Yes	No	No
Average answer to the "know past players" question of SM and SX	No	No	No	No	No	Yes	No
Out-group salience of other Muslim and Christian players	No	No	No	No	No	No	Yes
P-value of the Wald test: (2)+(4)=0	0.02	0.01	0.01	0.05	0.01	0.27	0.09
P-value of the Wald test: (5)=0	0.01	0.10	0.21	0.04	0.53	0.04	0.52
P-value of the Wald test: (2)+(4)=(5)	0.00	0.02	0.07	0.00	0.05	0.06	0.07
R^2	0.641	0.605	0.624	0.594	0.652	0.588	0.604
Observations	42	42	42	42	42	42	42

Notes: The table reports OLS estimates. The unit of observation is a dyad formed by a FFF donor and a SM or SX recipient. Standard errors are clustered at the donor level. *, ** and *** indicate significance at the 10, 5 and 1% levels.

Table 15: FFF guesses about other FFF generosity toward SM and SX recipients when SM and SX numbers increase. Robustness checks.

	Dep. var.: FFF guesses about FFF donations to SM and SX						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) FFF → SM	3.447*	3.447*	3.447*	3.447*	3.447*	3.447*	1.864
	(1.691)	(1.691)	(1.691)	(1.691)	(1.691)	(1.691)	(1.952)
(2) (FFF → SM)*Number of SM	-0.545	-0.545	-0.545	-0.545	-0.545	-0.545	-0.346
	(0.362)	(0.362)	(0.362)	(0.362)	(0.362)	(0.362)	(0.323)
(3) (FFF → SM)*Number of SX	-1.485	-1.485	-1.485	-1.485	-1.485	-1.485	-1.074
	(1.079)	(1.079)	(1.079)	(1.079)	(1.079)	(1.079)	(1.124)
(4) Number of SM	0.216	0.410*	0.392	0.299	0.230	-1.620	0.077
	(0.307)	(0.229)	(0.341)	(0.534)	(0.243)	(0.946)	(0.691)
(5) Number of SX	3.047***	2.288***	2.082	2.525***	0.867	2.931***	2.364*
	(0.778)	(0.746)	(1.295)	(0.782)	(0.752)	(0.843)	(1.263)
(6) Female	3.134***	0.985	0.623	0.503	1.740***	1.290*	0.867
	(0.351)	(0.595)	(0.878)	(0.546)	(0.426)	(0.668)	(0.999)
(7) Age	-0.015	-0.005	-0.013	-0.018	-0.021*	-0.018	-0.008
	(0.012)	(0.012)	(0.015)	(0.014)	(0.011)	(0.013)	(0.011)
(8) Education	0.145	-0.092	-0.136	-0.114	-0.201	0.001	-0.007
	(0.211)	(0.156)	(0.242)	(0.233)	(0.157)	(0.191)	(0.237)
(9) Household income	-0.073	-0.013	-0.008	0.064	-0.056	0.027	0.013
	(0.079)	(0.084)	(0.105)	(0.097)	(0.074)	(0.066)	(0.098)
(10) Religiosity	0.593**	0.235	0.150	0.217	0.185	0.438	0.312
	(0.246)	(0.212)	(0.284)	(0.344)	(0.157)	(0.270)	(0.272)
(11) Knows players from previous sessions	-2.904***	-0.909	0.168	-1.031	-0.148	-1.831**	-1.239
	(0.903)	(0.773)	(1.582)	(0.648)	(0.656)	(0.850)	(1.974)
Face fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Average gender of SM and SX	Yes	No	No	No	No	No	No
Average age of SM and SX	No	Yes	No	No	No	No	No
Average education of SM and SX	No	No	Yes	No	No	No	No
Average household income of SM and SX	No	No	No	Yes	No	No	No
Average religiosity of SM and SX	No	No	No	No	Yes	No	No
Average answer to the "know past players" question of SM and SX	No	No	No	No	No	Yes	No
Out-group salience of other Muslim and Christian players	No	No	No	No	No	No	Yes
P-value of the Wald test: (2)+(4)=0	0.31	0.68	0.67	0.64	0.20	0.03	0.68
P-value of the Wald test: (5)=0	0.00	0.01	0.12	0.00	0.26	0.00	0.08
P-value of the Wald test: (2)+(4)=(5)	0.00	0.01	0.12	0.01	0.15	0.00	0.01
R^2	0.696	0.586	0.620	0.614	0.748	0.634	0.570
Observations	42	42	42	42	42	42	42

Notes: The table reports OLS estimates. The unit of observation is a triad formed by a FFF guesser, a FFF donor and a SM or SX recipient. Standard errors are clustered at the guesser level. *, ** and *** indicate significance at the 10, 5 and 1% levels.

Table 16: Total donation received by all ethno-religious types of recipients from non-FFF donors when SM and SX numbers increase. Robustness checks.

	Dep. var.: Total donation received by all recipients from non-FFF donors						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) non-FFF → SM	-5.865	-5.865	-5.865	-5.865	-5.865	-5.865	-19.920
	(5.936)	(5.936)	(5.936)	(5.936)	(5.936)	(5.936)	(10.605)
(2) (non-FFF → SM)*Number of SM	0.788	0.788	0.788	0.788	0.788	0.788	2.076
	(2.605)	(2.605)	(2.605)	(2.605)	(2.605)	(2.605)	(2.417)
(3) (non-FFF → SM)*Number of SX	2.846	2.846	2.846	2.846	2.846	2.846	6.430*
	(3.157)	(3.157)	(3.157)	(3.157)	(3.157)	(3.157)	(2.944)
(4) non-FFF → FFF	-3.808	-3.808	-3.808	-3.808	-3.808	-3.808	-12.557**
	(3.069)	(3.069)	(3.069)	(3.069)	(3.069)	(3.069)	(4.091)
(5) (non-FFF → FFF)*Number of SM	0.936	0.936	0.936	0.936	0.936	0.936	1.738
	(1.661)	(1.661)	(1.661)	(1.661)	(1.661)	(1.661)	(1.057)
(6) (non-FFF → FFF)*Number of SX	0.923	0.923	0.923	0.923	0.923	0.923	3.154*
	(2.103)	(2.103)	(2.103)	(2.103)	(2.103)	(2.103)	(1.488)
(7) non-FFF → NA	0.519	0.519	0.519	0.519	0.519	0.519	1.896
	(2.799)	(2.799)	(2.799)	(2.799)	(2.799)	(2.799)	(3.630)
(8) (non-FFF → NA)*Number of SM	-0.673	-0.673	-0.673	-0.673	-0.673	-0.673	-0.799
	(0.899)	(0.899)	(0.899)	(0.899)	(0.899)	(0.899)	(1.014)
(9) (non-FFF → NA)*Number of SX	-0.308	-0.308	-0.308	-0.308	-0.308	-0.308	-0.659
	(0.832)	(0.832)	(0.832)	(0.832)	(0.832)	(0.832)	(0.910)
(10) Number of SM	-1.132	-0.293	-1.498	-1.571	-0.429	-0.900	-0.855
	(2.170)	(1.618)	(1.500)	(2.286)	(1.778)	(5.135)	(2.454)
(11) Number of SX	-0.790	0.256	-1.642	0.269	2.516	-0.061	-0.554
	(2.198)	(2.113)	(2.017)	(2.441)	(2.275)	(2.600)	(2.504)
Face fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Average gender of SM and SX	Yes	No	No	No	No	No	No
Average age of SM and SX	No	Yes	No	No	No	No	No
Average education of SM and SX	No	No	Yes	No	No	No	No
Average household income of SM and SX	No	No	No	Yes	No	No	No
Average religiosity of SM and SX	No	No	No	No	Yes	No	No
Average answer to the "know past players" question of SM and SX	No	No	No	No	No	Yes	No
Out-group salience of other Muslim and Christian players	No	No	No	No	No	No	Yes
P-value of the Wald test: (2)+(10)=0	0.85	0.83	0.57	0.62	0.81	0.98	0.44
P-value of the Wald test: (5)+(10)=0	0.91	0.73	0.22	0.72	0.65	0.99	0.59
P-value of the Wald test: (8)+(10)=0	0.56	0.70	0.31	0.40	0.66	0.78	0.61
P-value of the Wald test: (10)=0	0.62	0.86	0.35	0.51	0.82	0.87	0.74
R^2	0.159	0.106	0.560	0.284	0.317	0.078	0.190
Observations	48	48	48	48	48	48	48

Notes: The table reports OLS estimates. The unit of observation is a dyad formed by a non-FFF donor and a recipient. Standard errors are clustered at the session level. *, ** and *** indicate significance at the 10, 5 and 1% levels.

Appendix

Appendix A1: Evidence of FFF lower generosity toward SM prior to the socialization phase.

In this Appendix, we show that before the socialization phase as described in the main text of this paper, and in the context of a simultaneous trust game, FFF were more generous toward SX than they were to SM.

In the simultaneous trust 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 playing table in pairs. For each pair, one was assigned the role of "sender" and the other "receiver". Sender had 3 euros in his or her account, and could send any amount $\{0, 1, 2, 3\}$ to receiver (an amount that was known by the players to be tripled) by marking this amount on a sheet that receiver would never see. Receiver simultaneously marked on a sheet the sender would never see what percentage $\{0, 1/3, 2/3, 1\}$ of the amount received would be sent back to the sender. In other words, the novelty of our simultaneous trust game with respect to the original trust game introduced by Berg, Dickhaut and McCabe (1995) is in the simultaneity of the decisions made by the sender and by the receiver.

The amount sent by the sender in the trust game is commonly considered by experimental economists as a sign of trust, that is as the sender's belief that the receiver will be kind to him or her. This interpretation is even more relevant for our simultaneous trust game since this game was explicitly presented as the "Trust Game" by the instructor, that is as a game aiming to elicit trust on the side of the sender. 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 (what we call "generosity") and/or reciprocal altruism (i.e., an altruistic behavior based on the receiver's belief that the sender would be kind to him or her).[1]

The analysis of the amount sent and of the amount sent back in the simultaneous trust game when one focuses on pairs formed of FFF and SM or SX players[2] is reported in Tables A1-a and A1-b respectively. Note that starting from column 2 session fixed effects are controlled for, meaning that the number of SM and the number of SX in the game session is held at its average.

The non-significant coefficient of the dummy (FFF $\rightarrow$ SM) in all four columns of Table A1-a shows that FFF senders do not treat SM and SX receivers differently. Moreover, the p-value of the second Wald test at the bottom of Table A1-a shows that SM and SX senders treat FFF receivers similarly in all four specifications.

The significant negative coefficient of the dummy (FFF $\rightarrow$ SM) in the baseline (column 1) and in the most complete specifications (column 3 and column 4) of Table A1-b shows that FFF receivers send back less to SM senders than to SX senders. However, the p-value of the second Wald test at the bottom of Table A1-b shows that SM and SX receivers treat FFF senders similarly in all four specifications.

All in all, our analysis delivers two lessons. First, SX and SM players send and send back similar amounts to FFF. Second, FFF senders send similar amounts to SM and SX receivers but FFF receivers send back less to SM senders than to SX senders. We therefore interpret the lower amount sent back by FFF receivers to SM senders as reflecting FFF lower generosity (not lower trust) toward SM prior to the socialization phase.

[1] 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 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 interlocutors' levels of trust, generosity and/or reciprocal altruism.

[2] The pairs were created to converge to a situation where all FFF in a session would play the simultaneous trust game twice with each of the Senegalese players in that session, but not in the same role.

Table A1-a: Amount sent by the sender in the 2009 simultaneous trust game. OLS analysis.

	Dep. var.: Amount sent by the sender			
	(1)	(2)	(3)	(4)
(1) FFF → SM	-0.071	-0.112	-0.169	-0.032
	(0.137)	(0.138)	(0.280)	(0.286)
(2) SM → FFF	-0.679**	-0.706**	-1.242***	-0.963**
	(0.316)	(0.309)	(0.397)	(0.426)
(3) SX → FFF	-0.591**	-0.581**	-0.805	-0.497
	(0.222)	(0.231)	(0.582)	(0.490)
SES of the sender				
(4) Female			-0.372	-0.339
			(0.605)	(0.390)
(5) Age			-0.001	0.003
			(0.011)	(0.010)
(6) Household income			0.004	0.019
			(0.058)	(0.054)
(7) Education			-0.125	-0.111*
			(0.090)	(0.065)
(8) Religiosity			-0.102	-0.107
			(0.208)	(0.133)
(9) Knows players from previous sessions			1.123***	0.816***
			(0.335)	(0.294)
SES of the receiver				
(10) Female			-0.476	-0.431
			(0.375)	(0.274)
(11) Age			0.003	0.003
			(0.008)	(0.007)
(12) Household income			0.025	0.037
			(0.037)	(0.035)
(13) Education			-0.051	-0.029
			(0.059)	(0.055)
(14) Religiosity			0.032	0.035
			(0.086)	(0.090)
(15) Knows players from previous sessions			0.289	0.007
			(0.225)	(0.196)
P-value of the test: (1)=0	0.61	0.42	0.55	0.91
P-value of the test: (2)=(3)	0.80	0.69	0.41	0.30
Session fixed effects	No	Yes	Yes	Yes
Multiple Imputation Analysis	No	No	No	Yes
R^2	0.119	0.223	0.455	0.351
Observations	98	98	79	98

Notes: The table reports OLS estimates. The unit of observation is a dyad formed of FFF and SM or SX players. The dependent variable is categorical. It ranges from 0 (the sender sends nothing to the receiver) to 3 (the sender sends her total endowment to the receiver). "FFF → SM" is a dummy that takes the value 1 if the sender is FFF and the receiver is SM, and 0 otherwise. "SM → FFF" is a dummy that takes the value 1 if the sender is SM and the receiver is FFF, and 0 otherwise. "SX → FFF" is a dummy that takes the value 1 if the sender is SX and the receiver is FFF, 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" is a dummy that takes the value 1 if the player is female and the value 0 otherwise. "Age" is equal to the age of the player. "Education" is a categorical variable that ranges from 1 (less than primary school completed) to 10 (higher than college degree completed). "Household income" is a categorical variable that ranges from 1 (less than 500 euros monthly) to 11 (more than 7,500 euros monthly). "Religiosity" is a categorical variable that ranges from 1 (never attends religious services) to 7 (attends religious services several times a week). "Knows players from previous sessions" is a dummy that takes the value 1 if the player knows players who participated in previous game sessions and the value 0 otherwise. Standard errors are clustered at the sender level. *, ** and *** indicate significance at the 10, 5 and 1% levels.

Table A1-b: 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)
(1) FFF → SM	-0.092*	-0.061	-0.338**	-0.269**
	(0.052)	(0.066)	(0.127)	(0.118)
(2) SM → FFF	-0.029	-0.008	-0.288	-0.222
	(0.118)	(0.120)	(0.179)	(0.165)
(3) SX → FFF	-0.035	-0.031	-0.095	-0.088
	(0.120)	(0.114)	(0.237)	(0.212)
SES of the sender				
(4) Female			-0.308**	-0.163
			(0.147)	(0.127)
(5) Age			0.005*	0.003
			(0.003)	(0.002)
(6) Household income			-0.000	0.012
			(0.015)	(0.012)
(7) Education			-0.042*	-0.037*
			(0.023)	(0.021)
(8) Religiosity			-0.067	-0.075**
			(0.046)	(0.036)
(9) Knows players from previous sessions			0.339**	0.161
			(0.136)	(0.096)
SES of the receiver				
(10) Female			-0.016	0.110
			(0.193)	(0.168)
(11) Age			0.002	0.002
			(0.006)	(0.005)
(12) Household income			-0.019	-0.007
			(0.028)	(0.022)
(13) Education			-0.007	-0.015
			(0.043)	(0.035)
(14) Religiosity			-0.054	-0.057
			(0.075)	(0.053)
(15) Knows players from previous sessions			0.137	0.093
			(0.228)	(0.155)
P-value of the test: (1)=0	0.08	0.36	0.01	0.03
P-value of the test: (2)=(3)	0.96	0.86	0.35	0.50
Session fixed effects	No	Yes	Yes	Yes
Multiple Imputation Analysis	No	No	No	Yes
R^2	0.011	0.110	0.217	0.197
Observations	97	97	79	97

Notes: The table reports OLS estimates. The unit of observation is a dyad formed of FFF and SM or SX players. The dependent variable is categorical. It 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" is a dummy that takes the value 1 if the receiver is FFF and the sender is SM, and 0 otherwise. "SM → FFF" is a dummy that takes the value 1 if the receiver is SM and the sender is FFF, and 0 otherwise. "SX → FFF" is a dummy that takes the value 1 if the receiver is SX and the sender is 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. "Female" is a dummy that takes the value 1 if the player is female and the value 0 otherwise. "Age" is equal to the age of the player. "Education" is a categorical variable that ranges from 1 (less than primary school completed) to 10 (higher than college degree completed). "Household income" is a categorical variable that ranges from 1 (less than 500 euros monthly) to 11 (more than 7,500 euros monthly). "Religiosity" is a categorical variable that ranges from 1 (never attends religious services) to 7 (attends religious services several times a week). "Knows players from previous sessions" is a dummy that takes the value 1 if the player knows players who participated in previous game sessions and the value 0 otherwise. Standard errors are clustered at the receiver level. *, ** and *** indicate significance at the 10, 5 and 1% levels.

Appendix A2: Evidence that FFF lower generosity toward SM should be interpreted as taste-based rather than belief-based.

FFF lower generosity toward SM can reflect taste-based discrimination. But it can also reflect belief-based discrimination in case FFF believe that SX are poorer than SM and therefore need more money.

To test whether FFF hold different beliefs about SM and SX need for money, we recruited 50 FFF players in the 19th district in 2010, one year after conducting the experiments that allowed us to identify the Hortefeux effect. Pictures and the ascribed first names of the 6 recipients of the 2009 dictator game (see Figure 1) were shown to these players on a computer screen. FFF players were asked to guess the monthly income of each of the faces (with strategically altered names, as in our 2009 experiment). Notably, half of the FFF players saw the picture of the Senegalese woman and the picture of the Senegalese man with the ascribed first names "Khadija" and "Michel" respectively, and half saw the picture of the Senegalese woman and the picture of the Senegalese man with the ascribed first names "Joséphine" and "Aboubacar" respectively. This experimental set up allows us to test whether, holding the picture of the Senegalese constant, FFF hold different beliefs about his or her monthly income depending on whether his or her first name signals a Muslim or a Christian religious affiliation.

Our results are reported in Table A2 below. The non-significant coefficient of the dummy FFF → SM in all three columns of Table A2 shows that FFF do not believe that SM and SX monthly income differ. We therefore interpret FFF lower generosity toward SM as reflecting taste-based rather than belief-based discrimination.

Table A2: FFF beliefs about SM and SX monthly income. OLS analysis.

	Dep. var.: Monthly income of the recipient		
	(1)	(2)	(3)
(1) FFF → SM	0.020	-0.046	0.017
	(0.208)	(0.182)	(0.188)
(2) Male			0.502**
			(0.207)
(3) Age			0.009
			(0.017)
(4) Household income			0.128
			(0.080)
(5) Education			0.142
			(0.093)
(6) Religiosity			-0.126*
			(0.067)
Session fixed effects	No	Yes	Yes
Face fixed effects	No	Yes	Yes
R^2	0.000	0.322	0.431
Observations	100	100	96

Notes: The table reports OLS estimates. The unit of observation is a dyad formed of FFF and SM or SX players. The dependent variable is categorical. It ranges from 1 (less than 500 euros monthly) to 11 (more than 7,500 euros monthly). "FFF → SM" is a dummy that takes the value 1 if the recipient is SM, and 0 if the recipient is SX. "Male" is a dummy that takes the value 1 if the FFF player is male and the value 0 otherwise. "Age" is equal to the age of the FFF player. "Education" is a categorical variable that ranges from 1 (less than primary school completed) to 10 (higher than college degree completed). "Household income" is a categorical variable that ranges from 1 (less than 500 euros monthly) to 11 (more than 7,500 euros monthly). "Religiosity" is a categorical variable that ranges from 1 (never attends religious services) to 7 (attends religious services several times a week). Standard errors are clustered at the FFF player level. *, ** and *** indicate significance at the 10, 5 and 1% levels.

Appendix A3: SM and SX generosity toward their in-group when SM and SX numbers increase. OLS analysis.

	Dep. var.: SM and SX donations to their in-group			
	(1)	(2)	(3)	(4)
(1) SM → SM	0.711	-0.271	-1.189	-2.065
	(1.367)	(2.642)	(4.129)	(3.011)
(2) (SM → SM)*Number of SM	-0.740	-0.733	-0.846	-0.195
	(0.534)	(0.538)	(1.229)	(0.657)
(3) (SM → SM)*Number of SX	-0.328	0.383	0.892	0.694
	(0.690)	(1.701)	(2.512)	(1.940)
(4) Number of SM	0.290	0.268	0.381	-0.077
	(0.463)	(0.472)	(1.141)	(0.532)
(5) Number of SX	-0.355	-0.707	-1.006	-0.729
	(0.568)	(1.072)	(2.089)	(1.247)
(6) Female			0.131	0.152
			(0.504)	(0.383)
(7) Age			0.000	0.002
			(0.033)	(0.021)
(8) Education			0.030	0.059
			(0.158)	(0.072)
(9) Household income			-0.052	-0.052
			(0.108)	(0.081)
(10) Religiosity			-0.087	-0.085
			(0.250)	(0.146)
(11) Knows players from previous sessions			0.377	0.516
			(0.900)	(0.460)
P-value of the Wald test: (2)+(4)=0	0.10	0.07	0.22	0.38
P-value of the Wald test: (5)=0	0.54	0.52	0.64	0.56
P-value of the Wald test: (2)+(4)=(5)	0.88	0.83	0.80	0.72
Face fixed effects	No	Yes	Yes	Yes
Multiple Imputation Analysis	No	No	No	Yes
R^2	0.512	0.527	0.581	0.600
Observations	27	27	21	27

Notes: The table reports OLS estimates. The unit of observation is a dyad formed by a SM donor and a SM recipient or a SX donor and a SX recipient. The dependent variable is categorical. It ranges from 0 (the donor gives nothing to the recipient) to 5 (the donor gives her total endowment to the recipient). "SM → SM" is a dummy that takes the value 1 if the donor is SM and the recipient is SM, and the value 0 if the donor is SX and the recipient is SX. "Number of SM" is equal to the number of SM in the game session. "Number of SX" is equal to the number of SX in the game session. "Female" is a dummy that takes the value 1 if the donor is female and the value 0 otherwise. "Age" is equal to the age of the donor. "Education" is a categorical variable that ranges from 1 (less than primary school completed) to 10 (higher than college degree completed). "Household income" is a categorical variable that ranges from 1 (less than 500 euros monthly) to 11 (more than 7,500 euros monthly). "Religiosity" is a categorical variable that ranges from 1 (never attends religious services) to 7 (attends religious services several times a week). "Knows players from previous sessions" is a dummy that takes the value 1 if the donor knows players who participated in previous game sessions and the value 0 otherwise. The sum of the coefficients in rows (2) and (4) stands for the impact on the amount given by SM donors to SM recipients when there are no SM and no SX donors in the session, of having one additional SM in the game session. The coefficient in row (5) stands for the impact on the amount given by SX donors to SX recipients when there are no SM and no SX donors in the session, of having one additional SX in the game session. Standard errors are clustered at the donor level. *, ** and *** indicate significance at the 10, 5 and 1% levels.

Appendix A4: SM and SX generosity toward FFF recipients when SM and SX numbers increase. OLS analysis.

	Dep. var.: SM and SX donations to FFF			
	(1)	(2)	(3)	(4)
(1) SM → FFF	-1.422	-1.360	-3.696***	-2.749**
	(1.197)	(1.108)	(1.232)	(1.279)
(2) (SM → FFF)*Number of SM	-0.475	-0.506	0.388	-0.152
	(0.388)	(0.367)	(0.587)	(0.503)
(3) (SM → FFF)*Number of SX	1.025	1.030*	1.384	1.301**
	(0.612)	(0.563)	(0.931)	(0.602)
(4) Number of SM	0.457**	0.475***	0.208	0.245
	(0.192)	(0.170)	(0.491)	(0.267)
(5) Number of SX	-0.855*	-0.562	-0.776	-0.678
	(0.486)	(0.474)	(1.034)	(0.483)
(6) Female			0.423*	0.443*
			(0.223)	(0.235)
(7) Age			-0.032*	-0.006
			(0.017)	(0.016)
(8) Education			0.059	0.008
			(0.075)	(0.061)
(9) Household income			-0.087	-0.040
			(0.067)	(0.052)
(10) Religiosity			0.008	-0.107
			(0.121)	(0.100)
(11) Knows players from previous sessions			0.395	0.478
			(0.450)	(0.371)
P-value of the Wald test: (2)+(4)=0	0.96	0.92	0.09	0.77
P-value of the Wald test: (5)=0	0.09	0.25	0.46	0.17
P-value of the Wald test: (2)+(4)=(5)	0.17	0.37	0.23	0.17
Face fixed effects	No	Yes	Yes	Yes
Multiple Imputation Analysis	No	No	No	Yes
R^2	0.218	0.294	0.411	0.384
Observations	81	81	63	81

Notes: The table reports OLS estimates. The unit of observation is a dyad formed by a SM donor and a FFF recipient or a SX donor and a FFF recipient. The dependent variable is categorical. It ranges from 0 (the donor gives nothing to the recipient) to 5 (the donor gives her total endowment to the recipient). "SM → FFF" is a dummy that takes the value 1 if the donor is SM and the recipient is FFF, and the value 0 if the donor is SX and the recipient is FFF. "Number of SM" is equal to the number of SM in the game session. "Number of SX" is equal to the number of SX in the game session. "Female" is a dummy that takes the value 1 if the donor is female and the value 0 otherwise. "Age" is equal to the age of the donor. "Education" is a categorical variable that ranges from 1 (less than primary school completed) to 10 (higher than college degree completed). "Household income" is a categorical variable that ranges from 1 (less than 500 euros monthly) to 11 (more than 7,500 euros monthly). "Religiosity" is a categorical variable that ranges from 1 (never attends religious services) to 7 (attends religious services several times a week). "Knows players from previous sessions" is a dummy that takes the value 1 if the donor knows players who participated in previous game sessions and the value 0 otherwise. The sum of the coefficients in rows (2) and (4) stands for the impact on the amount given by SM donors to FFF recipients when there are no SM and no SX donors in the session, of having one additional SM in the game session. The coefficient in row (5) stands for the impact on the amount given by SX donors to FFF recipients when there are no SM and no SX donors in the session, of having one additional SX in the game session. Standard errors are clustered at the donor level. *, ** and *** indicate significance at the 10, 5 and 1% levels.