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ISSN 2183-0843

Working Paper No 2008

September 2020

## **NOVAFRICA** Working Paper

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# Preventing Violent Islamic Radicalization: Experimental Evidence on Anti-social Behavior\*

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September 2020

## **Abstract:**

Violence perpetrated by radicalized Muslims is a major problem around the world. We collaborated with the main Islamic authority in Mozambique, which sponsored two randomized interventions to prevent violence related to youth radicalization: a religious campaign against extremist views of Islam, targeting change in beliefs; and a training module on entrepreneurship and employment, aiming to increase the opportunity cost of conflict. Our measurement focuses on anti-social behavior in a Joy-of-destruction lab game. We find that only the religious treatment decreased the propensity to destroy payoffs of others. Consistently, surveys show increased trust in state and decreased support for extremism.

**JEL Codes:** D74, O55.

**Keywords:** Islamic Radicalization, Violence, Conflict, Political Economy, Experiment, Joy-of-destruction game, Mozambique, Africa.

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\* We wish to thank Imamo Mussa and Lúcio Raúl, whose dedication, persistence, and courage have made possible the implementation of this project on the ground. We are grateful to Marijke Verpoorten and to conference participants at NOVAFRICA for useful comments. The Mozambique team of the International Growth Centre, in particular Alberto da Cruz, provided invaluable institutional support. We are particularly grateful to Conselho Islâmico de Moçambique (CISLAMO) for a fruitful collaboration, specifically Sheikh Abdul Carimo and Nze Assuate. Pinto Polini, from the Provincial Government of Cabo Delgado, Alberto Sabão from the Protestant Church of Pemba, and Denise Wright at the University of Notre Dame, also provided institutional support. Finally, we would like to extend an appreciative word to the group of enumerators with whom we worked. IRB approvals were secured from Universidade Nova de Lisboa and the University of Notre Dame (Protocol #18-02-4454). A pre-analysis plan for this study is available at the AEA Registry (AEARCTR-0003775). We wish to acknowledge financial support from the International Growth Centre. Vicente also acknowledges support by the Kellogg Institute at the University of Notre Dame as a visiting fellow. All errors are our responsibility.

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In recent years, most of the major violent conflicts in the world have happened in Muslim-majority countries. Of these conflicts, a substantial and increasing share has been related to Islamist insurgents.<sup>1</sup> We can then safely assert that Islamic radicalization is one of the main correlates of violent conflict in the world today. Although the world awaked to Islamic radicalization with the 9/11 Al-Qaeda attacks in the US and subsequent war in Afghanistan, this phenomenon became clear in many different Muslim-majority countries. These include Iraq/Syria's, where ISIS has been particularly active, Nigeria, where Boko Haram was initiated, Somalia, home of Al-Shaabab, as well as many other countries across the Middle East and Caucasus, North and Central Africa, and South Asia, where ramifications of Islamist groups became prominent.

Conflict prevention in the context of Islamic radicalization is then a complex problem that requires attention. Different potential solutions have been tried. The obvious one is military, i.e., targeting terrorist organizations and specific (potential) aggressors within these. However, as it became clear from the very beginning of the Afghanistan war in 2001, the repression of terrorists cannot be enacted alone provided the risk of losing widespread local support.<sup>2</sup> Consistently, the US have focused on winning the 'hearts and minds' of the local populations in Afghanistan and Iraq through development interventions. This type of strategy became a focal point of practitioners since the work of Collier and Hoeffler (2004) and of Miguel et al. (2004), which emphasizes the idea that increasing the opportunity cost of engaging in conflict is a way to prevent it.

The counterinsurgency strategy based on material benefits is however sidelining the specificity of religious motivations behind Islamist violence. Radicalized Muslims have strong religious beliefs that may trump any material payoff. An alternative is to work with moderate Muslims to prevent the spread of radical Islam. The setting of our study, the province of Cabo Delgado in Northern Mozambique, faces the emergence of conflict linked to Islamic radicalization,<sup>3</sup> shortly after the local discovery of substantial natural resources. In 2010, there was a large discovery natural gas in Cabo Delgado, with the potential to turn the country into one of the largest exporters of liquefied natural gas in the world (World Bank, 2014). Although production will not begin for some years, foreign investment already started with major extractive multinationals beginning the construction

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<sup>1</sup> See the descriptive study by Gleditsch and Rudolfson (2016).

<sup>2</sup> This is a clear premise in 'The U.S. Army/Marine Corps Counterinsurgency Field Manual'.

<sup>3</sup> Recent attacks have been acknowledged by the Islamic State. See: <https://www.nytimes.com/2018/07/06/world/middleeast/isis-global-terrorism.html>; <https://www.theguardian.com/world/2019/jun/06/isis-claims-sub-saharan-attacks-sign-africa-ambitions-islamic-extremist>.

of a refinery plants and other infrastructures. These investments stand in contrast with the nature of Cabo Delgado province: a remote and primarily rural area of the country, home to a majority Muslim population, with high poverty and child mortality rates for Mozambican standards.

It is in this context that several attacks have been reported in the province of Cabo Delgado starting from the end of 2017. Although some doubts persist about the motivation for these attacks, some facts are undisputed. First, although the attacks were initially against state institutions like the police, they rapidly became widespread in rural areas, targeting civilians in roads or the destruction of entire villages, as well as foreign convoys linked to the natural gas operations. At this point, we can account for many hundred people killed in the sequence, often decapitated. Second, there are many associations of these episodes with radicalized Muslims.<sup>4</sup> There are many reports of infiltration of local mosques by individuals with links to international Islamist movements. Although the police was able to identify some foreigners connected to the violence, there is no doubt that most perpetrators of violence are Mozambican.<sup>5</sup> Still, long-standing Muslim authorities in the region have a tradition of peaceful positions, namely in the mediation of conflict-prone Mozambican politics. This is a setting where religious sensitization by Muslim authorities against a radical version of Islam makes particular sense as a way to prevent further violence.

In this paper, we report on the results of a randomized field experiment we conducted in the capital of Cabo Delgado. We collaborated with the main Muslim authority in Mozambique, which sponsored two conflict-prevention interventions, targeting young men from local mosques. The first intervention was a religious sensitization campaign submitted by religious leaders, who provided information about the lack of theological foundations of a number of typical claims by Islamic fundamentalists. Some of these claims had a direct connection to violent behavior. The main motivation of this campaign was to change the religious beliefs of subjects in the direction of moderate Islam. The second intervention was a training module on entrepreneurship and

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<sup>4</sup> A recent qualitative study presented by Saide Habibe, Salvador Forquilha, and João Pereira in May 2018, underlines that the attacks were initiated by a group named in Arabic ‘supporters of tradition.’ This group originates from Mocimboa da Praia. The study reports that the members of this movement, typically young and marginalized men, follow an extremist version of Islam and are funded through the illegal trading of local natural resources. The authors of the study also corroborate links with extremist groups in neighboring countries. Morier-Genoud (2020) presents evidence in the same direction.

<http://www.open.ac.uk/technology/mozambique/sites/www.open.ac.uk.technology.mozambique/files/files/Moci%CC%81mboa%20da%20Praia.pdf>

<sup>5</sup> See recent coverage:

<https://www.ft.com/content/5206046a-7070-11e8-92d3-6c13e5c92914>;

<https://www.economist.com/middle-east-and-africa/2018/08/09/a-bubbling-islamist-insurgency-in-mozambique-could-grow-deadlier>; <https://www.bbc.com/news/world-africa-44289512>.

employment in the local labor market. It made specific reference to the new jobs expected in the region in connection to the extraction of natural resources. The main idea of this module was to improve the economic prospects of subjects, i.e., as a way to increase the opportunity cost of engaging in conflict. Hence, we study the two main conflict-prevention strategies we alluded to: one, less standard, aiming to change religious beliefs, the other, more standard in both policy and research, aiming to change the economic prospects of potential perpetrators of violence.

Beyond studying conflict-prevention through changes in religious beliefs, the main innovation of this paper is in the measurement of outcomes. We focus our attention on measuring anti-social behavior. For that purpose, we employ a Joy-of-destruction lab game (Abbink and Sadrieh, 2009; Abbink, and Herrmann, 2011). To the best of our knowledge, this is among the first papers employing this standard game to draw conclusions for real-life behavior and policies.<sup>6</sup> The Joy-of-destruction game is played in pairs. Each subject has a unique decision to make, i.e., whether to destroy the endowment of the other player at a cost. Subjects play simultaneously. In our implementation of the lab game, the main Muslim sample we follow plays against four types of opponents: local Muslims, local Christians, local public officials, and foreigners. We measure beliefs about the behavior of counterparts as well. In our study, we are able to track 1,520 experimental decisions about destruction in the Joy-of-destruction game. We complement our behavioral measurements with standard survey-based attitudes.

Our results show that the religious sensitization reduced anti-social behavior in the Joy-of-destruction game: the magnitude of the effect is 8 percentage points on the probability that subjects in our main Muslim sample destroy the payoffs of their opponents. We observe no effects of the training module related to entrepreneurship and employment on the same outcome. In fact, this intervention increases significantly the belief that others will behave in an anti-social manner in the Joy-of-destruction game. We interpret this finding in light of the resource discovery in the region, which was mentioned explicitly during the training. Theory and evidence on the resource curse emphasize an increase in rent-seeking (Tornell and Lane, 1999; Baland and Francois, 2000; Torvik,

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<sup>6</sup> Scacco and Warren (2018) employed a version of this game in conflict-prone Nigeria, to assess the impact of social contact between Christian and Muslim young men. Prediger et al. (2014) show a correlation between anti-social behavior in the game and long-run resource scarcity among pastoralists in Namibia. Caldara et al. (2017) show that anti-social behavior in the game is associated with known triggers of conflict, i.e., fear, monetary incentives, and uncertainty about an opponent's desire to cause harm. More centered on the lab behaviors related to this game, Jauernig et al. (2016) create winners and losers and observe who becomes the target of destruction in the game, and who becomes the perpetrator of destruction; Sadrieh and Schröder (2017) find that perpetrators of harm in the Joy-of-destruction are also givers in the Dictator game.

2002) and a deterioration of political behavior (Robinson et al., 2006; Vicente, 2010; Brollo et al. 2013, Armand et al., 2020) following the discovery of natural resources. We also report on suggestive evidence that our main Muslim sample targets more anti-social behavior towards public officials and foreigners, consistently with the violent attacks that have taken place in the region. Finally, we observe effects of the religious campaign on survey attitudes, namely on increased optimism regarding peace in the region, increased trust in the state, and lower support for mixing religion with politics.

This paper contributes to four strands of literature. First, the vast literature on civil wars and the mechanisms behind the emergence of conflict (Blattman and Miguel, 2010; Dube and Vargas, 2013; Blattman and Annar, 2016; Berman et al., 2017). Second, the recent literature on US counterinsurgency strategies based on aid programs that target the livelihoods of the local communities (Berman et al., 2011a; Crost et al., 2014; Hirose et al., 2014; Beath et al., 2018; Lyall et al., 2018). Third, beyond conflict prevention based on material benefits, we also contribute to the literature that emphasizes the importance of attitudes of potential insurgents (Atran 2003; Krueger and Malečková, 2003; Abadie, 2006; Lyall, 2010; Berman et al., 2011b; Lyall et al., 2013; Bursztyrn et al., 2017). Finally, we add to the literature on community-driven reconstruction, which emphasizes that promoting collective action and social cohesion can be an enduring conflict-prevention strategy (Fearon et al., 2009, 2015; Fafchamps and Vicente, 2013; Collier and Vicente, 2014).

## **I. Experimental design**

### *A. Treatments*

We collaborated with the *Conselho Islâmico de Moçambique* (Islamic Council of Mozambique, CISLAMMO), as the main institution representing Muslims in Mozambique. CISLAMMO has a long record of political mediation in Mozambique, namely in the context of electoral observation. It had an important role in the peace agreement with RENAMO. In response to the violent events in Cabo Delgado associated to violent religious extremism, CISLAMMO developed a sensitization campaign against extremist views of Islam in the mosques of the capital city of Cabo Delgado, Pemba. This organization ended up sponsoring religious sensitization as well as a training module on business management and employment in the local labor market. Both initiatives were directed at young Muslim men recruited from the referred mosques. While the first targeted directly the views of

Muslims about Islamic doctrine as a way to oppose violence and insurgency, the second aimed to increase the opportunity cost of joining violent groups and engaging in conflict. We now turn to the details of each one of the interventions sponsored by CISLAMO.

A group of specialists in Islamic doctrine from CISLAMO developed the contents of the religious sensitization campaign, which we label the *religious treatment*. Specifically, they produced a written manual that provided the basis for the campaign, which took place verbally in classroom sessions at CISLAMO headquarters in Pemba. The referred manual, in Portuguese, is available upon request from the authors.<sup>7</sup> The manual and the sessions began by identifying the insurgents as ‘al khawarij,’ which means rebels or opponents who are not the true followers of the Prophet.<sup>8</sup> They then focused on deconstructing the main arguments presented by radicalized Muslims, with reference to passages of the Quran as well as narrations of events from the life of the Prophet (i.e., Hadiths, also considered as sacred by Muslims). The targeted extremist statements included but were not limited to: anyone who commits a sin is no longer a Muslim and will have no forgiveness; a Muslim cannot work for a non-Muslim government; a Muslim cannot befriend a non-Muslim; the only way to solve today’s problems is through violence; women’s rights are limited relative to men; Muslim children should attend madrassas and not secular schools; anyone who is not a believer should be considered an apostate and sentenced to death. The manual and sensitization campaign also included a number of personal views from major religious scholars about radicalized movements. During the classroom sensitization, the participants were free to ask questions, and discussions on specific topics happened frequently. Sensitization took place in January 2019 and was chaired by two religious leaders from CISLAMO.

Turning to the training module on business management and employment in the labor market, which we label the *economic treatment*, it was designed by a group of management teachers from a local college linked to CISLAMO, in coordination with members of our research team. They produced a manual on purpose for this treatment, which was delivered in the classroom. This manual is available, in Portuguese, upon request from the authors. The goals of the module were twofold. First, attention was devoted to business management and entrepreneurship, since a large share of the Muslim community in Cabo Delgado is managing their own business activities. Topics included how to make a business plan and a budget, how to get funding, namely from the financial

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<sup>7</sup> A webpage with the details of implementation of the treatments is available at <https://novafrica.org/lab-experiment-associated-to-radicalization-insurgency-in-cabo-delgado-mozambique/>.

<sup>8</sup> Campaigners reminded that the Prophet himself warned his followers against these groups of people who would kill in the name of Islam, who would recite the Quran but without true knowledge.



institutions in Cabo Delgado, and simple rules of thumb on business management like on the importance of registering all transactions and the separation of business accounting from personal accounting. Second, the module provided simple training on searching for jobs locally, including an overview of websites posting relevant jobs, going over current employers searching for collaborators, and the types of occupations and skills they were looking for (those linked to the exploration of natural gas featured prominently). The training also covered how to present oneself for an interview, and how to structure a CV. This treatment was offered at the CISLAMO headquarters in Pemba by trained facilitators in January 2019.

### *B. Sampling, assignment to treatment, and timeline*

The main sample in our field experiment is Muslim and was drawn from 21 mosques of Pemba. Individuals were selected by local religious leaders. They were then invited to participate in the study. The sample was composed of men 18-44 years of age, given that perpetrators of violence related to Islamic radicalization in Cabo Delgado are almost exclusively male and young. 241 individuals composed the main Muslim sample. Auxiliary samples were gathered for the purpose of the Joy-of-destruction lab game we played as part of the measurement in the experiment. The first auxiliary sample was Muslim and local, as it was drawn from three different mosques in the suburbs of Pemba. Thirty-seven young males were selected from there. The second auxiliary sample was Christian and local, as it was recruited from one church in Pemba. It included 37 young males. Appendix A to this paper shows the specific locations of the mosques and church of Pemba from where we drew participants to our study. The third auxiliary sample was selected from public officials working for the provincial government. Thirty-eight young males composed this sample. Finally, the fourth auxiliary sample was American and taken from the student population of the University of Notre Dame in the US. It consisted of 30 young males. We can then report that 383 individuals participated in our study.

The assignment of the main Muslim sample to the two treatment conditions, religious or economic, as well as to a control group followed simple randomization at the individual level. Each subject in this sample was either invited to a session on the religious treatment, invited to a session on the economic treatment, or had no treatment session assigned. The measurement activities followed and were conducted in all three groups, beginning with the Joy-of-destruction lab game and ensuing with the submission of individual surveys. These measurement activities were conducted from

January to March, 2019. In most cases, measurement activities were conducted in a group setting, but a few cases required following individuals in their homes.

### *C. Measurement*

Our measurement of outcomes in this paper is focused on a Joy-of-destruction lab game (Abbink and Sadrieh, 2009; Abbink, and Herrmann, 2011). This game measures anti-social behavior and is standard in the experimental literature. In this paper, we take the Joy-of-destruction game to measuring anti-social behavior in a meaningful field context, as an evaluation tool of different real-world interventions aimed at conflict prevention.

The Joy-of-destruction game we implemented involved two players faced with the same simultaneous binary decision: to destroy or not to destroy the other player's endowment. Each player in the game is initially given an endowment by the experimenter, which can then be destroyed by the other player at a cost. We worked with a version of this game including destruction of 50% of the other player's endowment and prices of destruction of 10% of one's own endowment. The best-case scenario is then that both players keep their endowment. This is the only Nash equilibrium of the game, which has the added feature that these are strongly dominant strategies. The worst-case scenario is that both players get 40% of their endowments, in case both pay to destroy the endowments of their counterparts.

All the individuals in our main Muslim sample played the game once with a player from each one of the auxiliary samples, i.e., one Muslim player, one Christian player, one public official, and one foreigner. When facing each opponent, players knew their gender (male) and age range. The remaining information was: for the Muslim opponent, that he was born and currently resides in Mozambique, as well as that he is a practicing Muslim; for the Christian opponent, that he was born and currently resides in Mozambique, as well as that he is a practicing Christian; for the public official, that he was born and currently resides in Mozambique, as well as that he is a public official working for the Provincial Government of Cabo Delgado; for the foreigner, that he was born and currently resides in the US. The order of play with each one of the auxiliary players was randomized between players. Individuals in the auxiliary samples also faced a randomized order, when playing with the four types of opponents.

After the four decisions about each one of the opponents, players were asked to guess what their opponents (in the same order they appeared in the game) had done in the game. These are their beliefs about the anti-social behavior of their opponents. These beliefs were incentivized in the sense that a correct guess entailed an additional prize amounting to 10% of the initial endowment in the game. In order to define payoffs, one of the opponents was randomly drawn from the four possibilities for each player (with equal probability). This was done in front of each subject at the end of the session. Endowments were 500 Meticaais (approximately 8 USD) for the Mozambican sample and 15 USD for the American sample. The first is approximately 10% of an average monthly salary in Northern Mozambique, and the second adjusts the first number for purchasing power parity relative to the US. All players were separately compensated for participating in the game at a fixed rate. The full protocol of the game is available in the pre-analysis plan of this project and in Appendix B of this paper.

In addition to the Joy-of-destruction game, we implemented an individual survey, which was submitted face-to-face after the lab game was conducted. Due to institutional constraints of our partners, in some cases, this was done several days or weeks after the game. In the case of Mozambican subjects, the survey started with basic demographic questions including education, ethnicity, household income and assets, among others. Other questions were dedicated to social capital, awareness about expectations about the exploration of natural resources in Cabo Delgado, trust in institutions, interest in politics, and views about the relationship between Islam and politics. The survey questions related to Mozambique and Islam were not submitted to the American sample. The full survey submitted to the Mozambican subjects is available in the pre-analysis plan of this project.

The survey attitudes we employ in our analysis are taken from the following five sets of survey questions. First, we compose a variable measuring whether respondents have heard about the natural gas discovery in Cabo Delgado. Second, we take a variable measuring whether the respondent agrees with the statement ‘The discovery of natural gas is good for peace in Mozambique.’ Third, we consider the extent of trust in the state from employing the question ‘How much do you trust the President of Mozambique?’, whose answer was on a scale of 0-3. Fourth, we assess interest in politics from using the question ‘How interested are you in public affairs?’, whose answer was on a scale of 0-3. Finally, we measure support for an Islamic autocracy by averaging the answers on a scale of 1-5 regarding the extent to which respondents agree with the following

statements: ‘Democracy goes against Islam,’ ‘Non-Muslims should have less rights than Muslims,’ and ‘There should be an Islamic government, without parties or elections.’

#### *D. Estimation strategy*

Our main analysis relates to estimating treatment effects on the different outcome variables that we have available concerning anti-social behavior and survey attitudes of the main Muslim sample. These effects of interest, of the religious and economic treatments ( $\beta^R, \beta^E$ ) can be estimated through the specification:

$$Y_{l,i} = \alpha + \beta^R T_i^R + \beta^E T_i^E + \theta X_{l,i} + \varepsilon_{l,i}, \quad (1)$$

where  $Y$  is an outcome of interest,  $l, i$  are identifiers for neighborhoods and individuals,  $X_{l,i}$  is a vector of neighborhood and individual demographic controls.  $T_i^R$  and  $T_i^E$  are dummy variables representing the treatments with value 1 for treated units.

Regarding the outcomes of the Joy-of-destruction lab game, we have available four different observations for each individual in the main sample, one per opponent  $j$ . For those outcomes, we also add a few important explanatory variables, as follows:

$$Y_{l,i,j} = \alpha + \beta^R T_i^R + \beta^E T_i^E + \gamma O_{i,j} + \delta C_{i,j} + \rho^R T_i^R \cdot C_{i,j} + \rho^E T_i^E \cdot C_{i,j} + \theta X_{l,i} + \varepsilon_{l,i,j}, \quad (2)$$

where  $O$  is a vector of order dummies in the game, for the four rounds of play each player in the main sample faced, and  $C$  is a vector of counterpart types in the game, for the four types of opponents each player faced. Interaction terms between the treatments and the counterpart types are also included.

For ease of interpretation and transparency, we employ OLS estimations throughout the paper.<sup>9</sup> We cluster standard errors at the level of the individual  $i$  in all regressions relating to the Joy-of-destruction game.

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<sup>9</sup> Results do not change significantly if we run instead Logit or Probit models for binary outcome variables.

## *E. Hypotheses*

We now turn to a description of the main hypotheses we test in our study. We follow a pre-analysis plan, which we published at the AEA Registry (AEARCTR-0003775). The emphasis on the analysis of the impact of the two treatments on behavioral measures gathered in the Joy-of-destruction game is clear in the pre-analysis plan.

Our first two hypotheses are that the religious and economic interventions are effective at decreasing anti-social behavior and the support for Islamic extremism including violence. These interventions could also increase trust in institutions. While the first is expected to work through a change in religious beliefs, the second is expected to work through an increase in the opportunity cost of engaging in conflict. We state these hypotheses in the following manner.

**Hypothesis 1:** Faced with the Islamic sensitization campaign, i.e., the religious treatment, young Muslim males in Cabo Delgado engage less often in anti-social behavior, are less sympathetic with Islamic extremism, including violence, and show higher trust levels in state institutions. This means we expect  $\beta^R > 0$  when the outcomes of interest are measured as positive.

**Hypothesis 2:** Faced with the training module on business management and employment in the labor market, i.e., the economic treatment, young Muslim males in Cabo Delgado engage less often in anti-social behavior, are less sympathetic with Islamic extremism, including violence, and show higher trust levels in state institutions. This means we expect  $\beta^E > 0$  when the outcomes of interest are measured as positive.

We do not have a clear prior with respect to the difference of the two treatment effects. In the same way, we do not have strong expectations about differences in behavior in the Joy-of-destruction game among the different types of players, i.e., Muslims, Christians, public officials, and foreigners. We do however have the prior that anti-social behavior increases when Muslims are paired with public officials or foreigners relative to when they are paired with the other types of opponents. As described above, indeed, public officials like security officers, and foreigners in convoys of gas of workers in the extractive industry have been the most prominent targets of violence motivated by Islamic extremism in Cabo Delgado. Our remaining hypothesis is then as follows.

**Hypothesis 3:** In the Joy-of-destruction lab game, anti-social behavior by Muslims in the main sample is most likely when they interact with public officials and foreigners. For that reason, positive treatment effects are most likely when interacting with those types of opponents.

## II. Econometric results

### *A. The Joy-of-destruction lab game*

We start by providing an overview of the main results of the Joy-of-destruction lab game.<sup>10</sup> In Figure 1, we show the treatment effects on the decision to destroy the opponent's endowment and the beliefs about destruction from opponents. We calculate the treatment effects using specification (1)<sup>11</sup> and show the point estimates and corresponding confidence intervals at the 10% level. The religious treatment decreases anti-social behavior measured in the game. Differently, we do not find that the economic treatment reduces anti-social behavior. However, there is a large effect of the economic treatment on the belief about destruction from the opponent in the game. In the rest of this section we go over these results in detail and discuss how the different opponents impact decisions.

In Table 1, we show treatment effects of the interventions on anti-social behavior in the lab game, i.e., assuming as outcome a binary variable taking value 1 in case the subject decided to destroy his opponent's endowment. We employ specification (2) above as well as simpler versions with a lower number of controls. We begin by reporting on a specification without any controls (column 1), we then add order dummies (column 2), and subsequently add other controls (column 3). In columns (4)-(7) we add counterpart dummies for Christian, public official, and foreigner opponents (the omitted category is Muslim). We distinguish between specifications without (columns 4-5) and with (columns 6-7) interactions with the treatment dummies (with and without individual demographic controls). At the bottom of the table, we show tests of differences between the two treatment effects, as well as of the joint relevance of the counterpart dummies and of the differences between them.

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<sup>10</sup> Note that in Appendix C we show descriptive statistics of the sample as well as evidence that the randomization was successful.

<sup>11</sup> Controls are neighborhood dummies and individual demographic variables. Individual demographic variables are mentioned in the notes to the tables.

We observe a negative effect of the religious treatment on the probability of destruction in the Joy-of-destruction lab game. The magnitude of the effect is consistently 8 percentage points, across the main specifications (1)-(3). This treatment effect is significant at the 10% level. The same results appear when including counterpart dummies. This means that Hypothesis 1 in our paper seems to be true. However, we do not find any effects on destruction in the game of the economic treatment, contrary to Hypothesis 2 in our paper. These are indeed very close to zero in terms of magnitude, which means we can actually say that the effects of the religious and economic treatments are significantly different from each other (at the 10% level of statistical significance). When we add counterpart dummies to the specification, we do not see clear effects of these variables. However, we are closest to statistical significance when comparing Muslims to foreigners, as well as when comparing Christians to public officials and Christians to foreigners: facing foreigners and public officials seems to increase the propensity to destroy payoffs of opponents, relative to the other types of opponents. These differences are actually statistically significant for the control group when treatment interactions are added to the specification. These patterns are suggestive that Hypothesis 3 is partly true, although we do not find any significant interaction effects between the counterpart dummies and the treatments.

Table 2 is dedicated to the analysis of beliefs about destruction from opponents in the main Muslim sample.<sup>12</sup> The specifications and tests we implement are analogous to those in Table 1.

From the analysis of Table 2, we find a consistently negative effect of the religious treatment, in line with effects we found for Table 1 and Hypothesis 1 in the paper. However, this effect is never statistically significant at standard levels. Surprisingly, we find a strong positive effect of the economic treatment, ranging between 11 and 13 percentage points across specifications (1)-(5), which is significant at the 5% level. This effect suggests that the economic treatment may have triggered an expectation of added economic competition, leading to more anti-social behavior from others, consistently with the theoretical effects of the resource bonanza (emphasized in the contents of the economic treatment). When we add counterpart dummies, we find a clear expectation that foreigners will destroy endowments relative to Muslims – this is a difference of 6 percentage points, significant at the 5% confidence level. The difference between Christians and foreigners also approaches statistical significance in the same direction, i.e., that foreigners are expected to be more anti-social than Christians (this is actually significant for the control group when considering

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<sup>12</sup> The behavior in the Joy-of-destruction game by the auxiliary samples is shown in Appendix D.

interactions with the treatment variables). This pattern is similar to the one we found in Table 1, and so to Hypothesis 3 in the paper. Like before, we do not find any statistically significant interactions between the counterpart dummies and the two treatment variables.

The evidence in the Joy-of-destruction game allows us to conclude that the religious treatment was effective at decreasing the extent of anti-social behavior. This stands out as different from what we find for the economic treatment, which seems to yield no effects on anti-social behavior. In fact, in the opposite direction, when faced with the economic treatment, our main Muslim sample believes their counterparts will be more aggressive towards them. This may be due to an added sense of competition in line with the opportunities arising from the recent discovery of natural resources in the province of Cabo Delgado. We also find suggestive evidence that our main Muslim sample behaves in a more anti-social manner when facing public officials and foreigners, which is consistent with the recent violent attacks in the region.

### *B. Survey attitudes*

In this section, we devote our attention to the outcome variables from our survey measures of attitudes. We focus on the main Muslim sample.

Table 3 shows the effects of the religious and economic treatments on a set of survey attitudes. We follow the simplest specification we introduced above, i.e., specification (1). The dependent variables we employ concern the survey questions we described in our section on measurement. They concern awareness about the discovery of natural gas, expectation about whether the discovery of natural gas is good for peace, the extent of trust in the state, the extent of interest in politics, and the extent of support for Islamic autocracy. All dependent variables except the first, which is a dummy variable, are standardized as z-scores, i.e., by taking the mean of the control group and dividing by the standard deviation in the same comparison group.

In addition to our two effects of interest, we also display at the bottom of the table the test of the difference between them. All our regressions include full controls like in Table 1 and 2.

Consistent with the fact that the natural gas discovery was mentioned in both the religious and economic treatments, we find strong effects on awareness about that discovery: these are effects of 37 and 40 percentage points for the religious and economic treatments, respectively, with both



being statistically significant at the 1% level. On the perception of whether the discovery is good for peace in Mozambique, we only see a significant positive effect for the religious treatment: the magnitude is 0.34 standard deviation units, significant at the 10% level of confidence. Trust in the state increases for both treatments, by 0.28 (religious) and 0.25 (economic) standard deviation units, both statistically significant at the 10% level. Turning to the interest Muslims in our main sample have in politics, we find negative effects of the treatments. However, only the religious one has a significant impact (at the 10% level): the size of the coefficient is 0.39 standard deviation units. Finally, support for an Islamic autocracy is impacted by both treatments significantly (at the 5 or 10% levels): the religious treatment leads to a decrease in 0.35 standard deviation units, and the economic treatment leads to a decrease in 0.27 standard deviation units. We do not find statistically significant differences between the two treatment effects for any of these outcome variables.

We conclude in favor of evidence that the religious treatment increased awareness about natural resources in Cabo Delgado, raised optimism regarding the impact of natural resources on peace, improved trust in the state, decreased interest in politics, and diminished support for Islamic preponderance over democratic politics. These effects are consistent with the impact of this treatment on decreasing the extent of anti-social behavior that we observed for the Joy-of-destruction lab game (Hypothesis 1). Although rising awareness about natural resources is consistent with the previous results of the economic treatment, the increase in trust and the decrease in support for an Islamic autocracy seem to add a more positive tone to the effects of the economic treatment (in line with Hypothesis 2).

### **III. Concluding remarks**

In this paper, we follow two types of randomized conflict-prevention initiatives sponsored by an Islamic authority in Northern Mozambique. This is in a context where the discovery of substantial natural resources in the region has been accompanied by the emergence of violence related to radicalized Muslims. The first initiative is a religious sensitization campaign calling for a moderate Islam. The second is a training module on entrepreneurship which also facilitates employment. We study a sample of young men recruited from mosques and focus our attention on the impact of the referred interventions in terms of anti-social behavior as measured in a Joy-of-destruction lab game. We also employ standard survey measures of attitudes. We find that the religious intervention decreased the prevalence of anti-social behavior measured in the lab game. We do not find effects for the economic intervention, although it increased the belief that other will be aggressive,

consistently with theories of the resource curse. We also observe that young Muslims become more optimistic, more trustful in state institutions, and less supportive of extremism, when faced with moderate religious campaigning.

Although the results presented in this paper do not show that the interventions we followed prevented actual conflict, our study presents suggestive evidence that religious sensitization by Islamic authorities works in the direction of conflict prevention, through less anti-social behavior and less support for extremism. Together with other recent evidence for the same setting (Armand et al., 2020), which shows that information given to the local communities averted real conflict events, this paper contributes to a body of evidence on the important role of broad-based information campaigning in conflict-prevention. This is particularly relevant to policy-makers whose first-reaction, when faced with the emergence of violent Islam, is purely repressive. This strategy has well-known risks in the longer run, namely of losing the support of moderate local populations, when it is difficult to isolate the true origins of violence. Reaching to the communities with moderate information is not a substitute to guaranteeing security by force. However, as the evidence we presented suggests, it is likely to be a crucial element of a balanced and effective strategy of conflict-prevention.

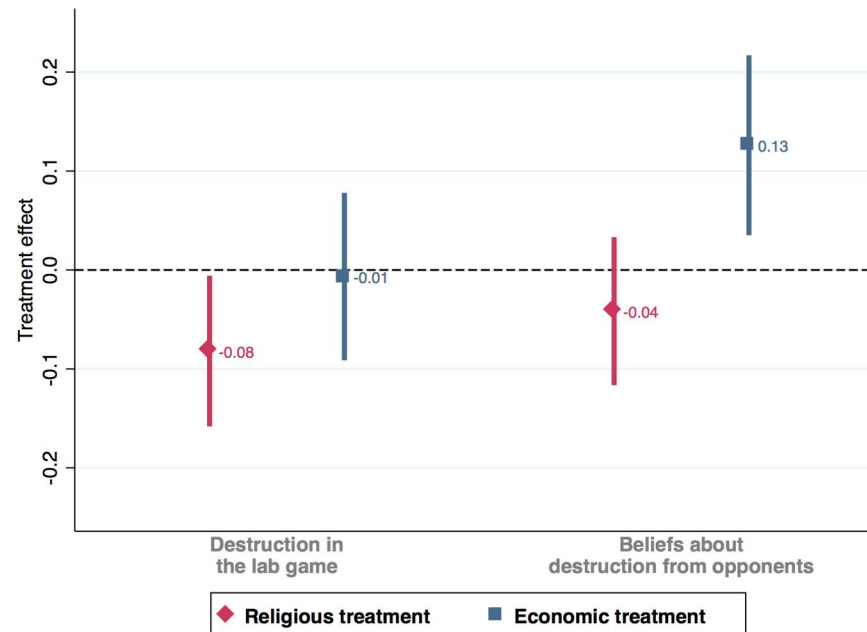
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**Figure 1: Treatment effects in the Joy-of-destruction game**



Note: This graph shows the treatment effect estimates based on two OLS regressions following specification (1) as detailed in the paper. The dependent variable in the first regression (destruction in the lab game) is a dummy variable taking value 1 when the subject destroys the endowment of his partner in the Joy-of-destruction lab game. In the second regression (beliefs about destruction from opponents), the dependent variable is a dummy variable taking value 1 when the subject believes his opponent will destroy the subject's endowment in the Joy-of-destruction lab game. We present the treatment effect of the religious treatment in red (diamonds) and of the economic treatment in blue (squares). Controls are neighborhood dummies and individual demographic variables. Demographic variables are: age, age squared, number of adults in the household, years of education, years of education squared, dummy for Macua ethnicity, dummy for Mwani ethnicity, monthly expenditure, and ownership of assets (fridge, oven, car, tv and radio). Confidence intervals are built using statistical significance at the 10% level, and standard errors are clustered at the individual level.

**Table 1: Joy-of-destruction - main results**

	<b>Destruction of opponents' endowment</b>						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<b>Religious treatment</b>	<b>-0.075</b>	<b>-0.075</b>	<b>-0.082</b>	<b>-0.075</b>	<b>-0.082</b>	<b>-0.067</b>	<b>-0.075</b>
	<b>(0.044)</b>	<b>(0.044)</b>	<b>(0.046)</b>	<b>(0.044)</b>	<b>(0.046)</b>	<b>(0.053)</b>	<b>(0.057)</b>
<b>Economic treatment</b>	<b>-0.002</b>	<b>-0.002</b>	<b>-0.007</b>	<b>-0.002</b>	<b>-0.007</b>	<b>0.035</b>	<b>0.030</b>
	<b>(0.049)</b>	<b>(0.049)</b>	<b>(0.051)</b>	<b>(0.049)</b>	<b>(0.051)</b>	<b>(0.059)</b>	<b>(0.061)</b>
Counterpart (omitted=Muslim)							
Christian				0.008	0.008	-0.017	-0.017
				(0.026)	(0.026)	(0.035)	(0.035)
Public official				0.033	0.033	0.069	0.069
				(0.032)	(0.032)	(0.046)	(0.046)
Foreigner				0.045	0.045	0.094	0.094
				(0.029)	(0.030)	(0.049)	(0.050)
Christian x religious treatment						0.064	0.065
						(0.046)	(0.048)
Public official x religious treatment						-0.021	-0.020
						(0.060)	(0.062)
Foreigner x religious treatment						-0.073	-0.073
						(0.065)	(0.067)
Christian x economic treatment						0.012	0.012
						(0.046)	(0.047)
Public official x economic treatment						-0.084	-0.084
						(0.057)	(0.058)
Foreigner x economic treatment						-0.075	-0.075
						(0.065)	(0.066)
Religious=economic (p-value)	0.087	0.088	0.091	0.088	0.091	0.063	0.056
Christian=0; official=0; foreigner=0 (p-value)				0.369	0.38	0.08	0.085
Christian=official (p-value)				0.324	0.331	0.051	0.054
Official=foreigner (p-value)				0.641	0.641	0.523	0.528
Christian=foreigner (p-value)				0.134	0.137	0.011	0.012
Number of observations	972	972	964	972	964	972	964
R-squared	0.008	0.008	0.071	0.010	0.073	0.014	0.077
Mean dependent variable (control group)	0.191	0.191	0.191	0.191	0.191	0.191	0.191
Order dummies	N	Y	Y	Y	Y	Y	Y
Controls	N	N	Y	N	Y	N	Y

Notes: This table shows OLS regressions using as dependent variable a dummy variable taking value 1 when the subject destroys the endowment of his partner in the Joy-of-destruction lab game. We are only considering the main sample of Muslim players in the experiment. We present the p-value for tests of five hypotheses. The first is for the equality of coefficients of treatments: religious=economic. Additional tests relate to coefficients of counterpart variables: we show results for jointly testing if the three coefficients of the counterpart dummies are equal to zero; then we show results for testing differences within each pair of counterparts. Specifications in columns (3), (5) and (7) include controls. Controls are neighbourhood dummies and individual demographic variables. Demographic variables are: age, age squared, number of adults in the household, years of education, years of education squared, dummy for Macua ethnicity, dummy for Mwani ethnicity, monthly expenditure, and ownership of assets (fridge, oven, car, tv and radio). Standard errors are clustered at the individual level and presented in parenthesis.

**Table 2: Joy-of-destruction - beliefs**

	Beliefs about destruction from opponents						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<b>Religious treatment</b>	<b>-0.049</b>	<b>-0.049</b>	<b>-0.042</b>	<b>-0.049</b>	<b>-0.042</b>	<b>-0.068</b>	<b>-0.062</b>
	<b>(0.042)</b>	<b>(0.042)</b>	<b>(0.045)</b>	<b>(0.042)</b>	<b>(0.045)</b>	<b>(0.051)</b>	<b>(0.053)</b>
<b>Economic treatment</b>	<b>0.114</b>	<b>0.114</b>	<b>0.126</b>	<b>0.114</b>	<b>0.126</b>	<b>0.105</b>	<b>0.116</b>
	<b>(0.053)</b>	<b>(0.053)</b>	<b>(0.055)</b>	<b>(0.053)</b>	<b>(0.055)</b>	<b>(0.062)</b>	<b>(0.065)</b>
Counterpart (omitted=Muslim)							
Christian				0.020	0.020	-0.041	-0.041
				(0.028)	(0.028)	(0.041)	(0.041)
Public official				0.033	0.034	0.024	0.024
				(0.028)	(0.029)	(0.049)	(0.050)
Foreigner				0.058	0.058	0.087	0.087
				(0.026)	(0.026)	(0.044)	(0.045)
Christian x religious treatment						0.094	0.095
						(0.062)	(0.064)
Public official x religious treatment						0.003	0.005
						(0.062)	(0.064)
Foreigner x religious treatment						-0.021	-0.019
						(0.056)	(0.057)
Christian x economic treatment						0.085	0.085
						(0.052)	(0.053)
Public official x economic treatment						0.019	0.019
						(0.063)	(0.064)
Foreigner x economic treatment						-0.066	-0.066
						(0.059)	(0.060)
Religious=economic (p-value)	0.001	0.001	0.001	0.001	0.001	0.003	0.002
Christian=0; official=0; foreigner=0 (p-value)				0.144	0.154	0.018	0.02
Christian=official (p-value)				0.628	0.626	0.172	0.177
Official=foreigner (p-value)				0.343	0.354	0.246	0.252
Christian=foreigner (p-value)				0.136	0.141	0.002	0.002
Number of observations	972	972	964	972	964	972	964
R-squared	0.030	0.032	0.076	0.035	0.079	0.038	0.082
Mean dependent variable (control group)	0.176	0.176	0.176	0.176	0.176	0.176	0.176
Order dummies	N	Y	Y	Y	Y	Y	Y
Controls	N	N	Y	N	Y	N	Y

Notes: This table shows OLS regressions using as dependent variable a dummy variable taking value 1 when the subject believes his opponent will destroy the subject's endowment in the Joy-of-destruction lab game. We are only considering the main sample of Muslim players in the experiment. We present the p-value for tests of five hypotheses. The first is for the equality of coefficients of treatments: religious=economic. Additional tests relate to coefficients of counterpart variables: we show results for jointly testing if the three coefficients of the counterpart dummies are equal to zero; then we show results for testing differences within each pair of counterparts. Specifications in columns (3), (5) and (7) include controls. Controls are neighbourhood dummies and individual demographic variables. Demographic variables are: age, age squared, number of adults in the household, years of education, years of education squared, dummy for Macua ethnicity, dummy for Mwanu ethnicity, monthly expenditure, and ownership of assets (fridge, oven, car, tv and radio). Standard errors are clustered at the individual level and presented in parenthesis.



**Table 3: Survey attitudes**

	Discovery of natural gas		Trust in state	Interested in politics	Support for Islamic autocracy
	Heard about it	Good for peace			
	(1)	(2)			
Religious treatment	0.373 (0.055)	0.344 (0.204)	0.283 (0.160)	-0.391 (0.215)	-0.346 (0.172)
Economic treatment	0.403 (0.052)	0.209 (0.192)	0.254 (0.151)	-0.205 (0.205)	-0.271 (0.163)
Religious=economic (p-value)	0.587	0.433	0.851	0.302	0.657
Number of observations	241	196	237	201	235
R-squared	0.332	0.155	0.179	0.140	0.160
Mean dependent variable (control group)	0.580	-0.070	-0.138	0.124	0.261

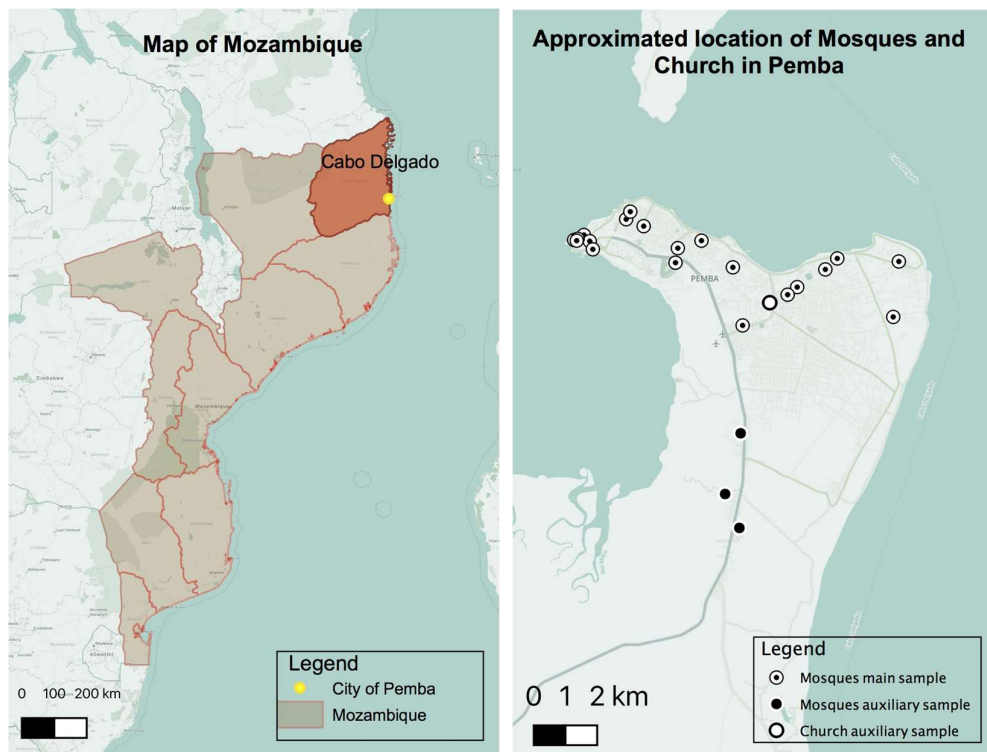
Notes: All dependent variables are presented in z-scores except column (1). The dependent variable in column (1) is a dummy variable taking value 1 when the subject heard about the discovery of natural gas. The dependent variable in column (2) is coded from a dummy variable taking value 1 when the subject agrees with the statement 'The discovery of natural gas is good for peace in Mozambique.' The dependent variable in column (3) is coded from the answer to the question 'How much do you trust the President of Mozambique?', on a scale of 0-3. The dependent variable in column (4) is coded from the answer to the question 'How interested are you in public affairs?', on a scale of 0-3. The dependent variable in column (5) is the mean level of agreement with the following three sentences, which are set on a scale of 1-5: 'Democracy goes against Islam,' 'Non-Muslims should have less rights than Muslims,' and 'There should be an Islamic government, without parties or elections.' For all the regressions in the table the coefficients we show correspond to the simple treatment variables. We are only considering the main sample of Muslim players in the experiment. Additional controls are the same as in Tables 1 and 2 and are included in all regressions. Standard errors are presented in parenthesis.

# FOR ONLINE PUBLICATION

## APPENDIX FOR

### ‘Preventing Violent Islamic Radicalization: Experimental Evidence on Anti-social Behavior’

#### A. Location of the sampled mosques and church



Note: Basemaps were created using ArcGIS<sup>®</sup> software by Esri<sup>®</sup>. Basemaps are used in line with the Esri Master License Agreement, specifically for the inclusion of screen captures in academic publications. We use the *World Light Grey Base* (sources: Esri, HERE, Garmin, <sup>®</sup>OpenStreetMap contributors, and the GIS User Community).

## **B. Protocol of the Joy-of-destruction Game - as implemented with the American sample**

### **Instructions for Participants**

Thank you for participating in this activity. The activity will last approximately 45 minutes. If you read the following instructions carefully, you can, depending on your own decisions, earn a considerable amount of money. It is therefore very important that you read these instructions carefully.

These instructions are solely for your private use. It is not allowed to communicate with the other participants during the activity. Should you have any questions, please ask us. If you violate this rule, we will have to dismiss you from the experiment and you will forfeit all payments.

You will be paid after the activity is over. No other participant will know how much you earned. You will receive \$10 for showing up plus any additional earnings that you have in the activity. Your earnings also depend on the decisions of other participants, so you will receive that amount at a posterior date.

In the activity you are randomly matched with another participant – your partner. You will not learn the identity of the participant you are matched with, and vice-versa, your partner will never learn about your identity. Throughout the game you will partner with different people. At the end, one of the partners will be randomly chosen to be implemented and define your payoff. Since each pair is as likely to be chosen please be careful when making each of your decisions.

The activity is the following:

1. You and your partner both receive an endowment equivalent to \$15.
2. You then have to decide whether to reduce your partner's income or to leave it as it is. Reducing your partner's income will cost you \$1.5, and reduces the equivalent to \$7.5 of your partner's income.
3. Your partner simultaneously takes the same decision. He can choose between leaving your income unaltered, or reducing it by \$7.5. Your partner will incur the same cost (equivalent to \$1.5) if he chooses to reduce your income.

What can happen:

If both of you choose to leave the other person's income unaltered, both of you will earn the equivalent to \$15.

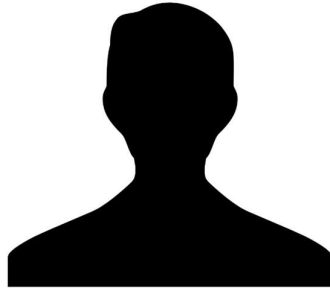
If both of you choose to reduce the other person's income, both of you will earn the equivalent to \$6 ( $=15-7.5-1.5$ ).

If you choose to reduce your partner's income, but he decides to leave your income unaltered, you will earn \$13.5 ( $=15-1.5$ ) and your partner will earn the equivalent to \$7.5 ( $=15-7.5$ ).

If you choose not to reduce your partner's income, but he decides to reduce yours, you will earn \$7.5 ( $=15-7.5$ ) and your partner will earn the equivalent to \$13.5 ( $=15-1.5$ ).

Your partner is a real person. Each participant receives some information about whom he is playing with. But you will never know the identity of your partner. And your partner will never know your identity either.

**PARTNER X**



**Male**  
**Age between 18-30**  
**Born in Mozambique, where he resides**  
**Practicing Muslim**

Remember:

If both of you choose to leave the other person's income unaltered, both of you will earn the equivalent to \$15.

If both of you choose to reduce the other person's income, both of you will earn the equivalent to \$6 (=15-7.5-1.5).

If you choose to reduce your partner's income, but he decides to leave your income unaltered, you will earn \$13.5 (=15-1.5) and your partner will earn the equivalent to \$7.5 (=15-7.5).

If you choose not to reduce your partner's income, but he decides to reduce yours, you will earn \$7.5 (=15-7.5) and your partner will earn the equivalent to \$13.5 (=15-1.5).

Your partner will also have to decide among the same set of possibilities.

Please think about your decision carefully.

Reduce your partner (X) income.	
Keep your partner (X) income as it is.	

**PARTNER W**



**Male**  
**Age between 18-30**  
**Born in Mozambique, where he resides**  
**Practicing Christian**

Remember:

If both of you choose to leave the other person's income unaltered, both of you will earn the equivalent to \$15.

If both of you choose to reduce the other person's income, both of you will earn the equivalent to \$6 (=15-7.5-1.5).

If you choose to reduce your partner's income, but he decides to leave your income unaltered, you will earn \$13.5 (=15-1.5) and your partner will earn the equivalent to \$7.5 (=15-7.5).

If you choose not to reduce your partner's income, but he decides to reduce yours, you will earn \$7.5 (=15-7.5) and your partner will earn the equivalent to \$13.5 (=15-1.5).

Your partner will also have to decide among the same set of possibilities.

Please think about your decision carefully.

Reduce your partner (W) income.	
Keep your partner (W) income as it is.	

**PARTNER Y**



**Male**  
**Age between 18-30**  
**Born in Mozambique, where he resides**  
**He is a public official with the Provincial Government of Cabo Delgado**

Remember:

If both of you choose to leave the other person's income unaltered, both of you will earn the equivalent to \$15.

If both of you choose to reduce the other person's income, both of you will earn the equivalent to \$6 (=15-7.5-1.5).

If you choose to reduce your partner's income, but he decides to leave your income unaltered, you will earn \$13.5 (=15-1.5) and your partner will earn the equivalent to \$7.5 (=15-7.5).

If you choose not to reduce your partner's income, but he decides to reduce yours, you will earn \$7.5 (=15-7.5) and your partner will earn the equivalent to \$13.5 (=15-1.5).

Your partner will also have to decide among the same set of possibilities.

Please think about your decision carefully.

Reduce your partner (Y) income.	
Keep your partner (Y) income as it is.	

**PARTNER Z**



**Male**  
**Age between 18-30**  
**Born in the USA, where he resides**

Remember:

If both of you choose to leave the other person's income unaltered, both of you will earn the equivalent to \$15.

If both of you choose to reduce the other person's income, both of you will earn the equivalent to \$6 (=15-7.5-1.5).

If you choose to reduce your partner's income, but he decides to leave your income unaltered, you will earn \$13.5 (=15-1.5) and your partner will earn the equivalent to \$7.5 (=15-7.5).

If you choose not to reduce your partner's income, but he decides to reduce yours, you will earn \$7.5 (=15-7.5) and your partner will earn the equivalent to \$13.5 (=15-1.5).

Your partner will also have to decide among the same set of possibilities.

Please think about your decision carefully.

Reduce your partner (Z) income.	
Keep your partner (Z) income as it is.	

We now ask you to estimate if your partner decides to reduce your income by \$7.5 at the cost of the equivalent to \$1.5. If your expectation is correct you will earn another \$1.5.



My partner X: **Male**  
**Age between 18-30**  
**Born in Mozambique, where he resides**  
**Practicing Muslim**

My partner (X) will reduce my income.	
My partner (X) will keep my income as it is.	

My partner W: **Male**  
**Age between 18-30**  
**Born in Mozambique, where he resides**  
**Practicing Christian**

My partner (W) will reduce my income.	
My partner (W) will keep my income as it is.	

My partner Y: **Male**  
**Age between 18-30**  
**Born in Mozambique, where he resides**  
**He is a public official with the Provincial Government of Cabo Delgado**

My partner (Y) will reduce my income.	
My partner (Y) will keep my income as it is.	

My partner Z: **Male**  
**Age between 18-30**  
**Born in the USA, where he resides**

My partner (Z) will reduce my income.	
My partner (Z) will keep my income as it is.	

Before we finish, we will randomly draw the partner that will be implemented. To guarantee randomness, we place 4 pieces of paper with letters X-W-Y-Z in a bag.

You will take out one piece of the paper from the bag without looking at the bag.

Which letter did you get?

Thank you for participating in this activity.

After you have made your decision, we ask you to remain seated. You will receive a short questionnaire, which we will also ask you to please complete.

### **C. Balance tests for the main sample and characteristics of the auxiliary samples**

In this section we start by checking the balance between comparison groups and descriptive statistics in the main Muslim sample in Table C1. In the first column of that table, we display the mean and standard deviation for the control group for each of the demographic characteristics. The second column presents the difference to the two treatment groups together. The third and fourth columns show the differences between the control group and each one of the treatment groups, i.e., the religious and the economic treatments, respectively. The fifth column is dedicated to joint tests of significance of the two treatment effects for each demographic characteristic.

In Table C2 we present the mean and standard deviation (in parenthesis) of the previous demographic characteristics for each subsample in the study. In the first column we consider the main Muslim sample in the randomized experiment (control group and the two treatments). Columns (2)-(5) present descriptive statistics for the auxiliary samples of partners for the joy-of-destruction game. Column (2) reports on the auxiliary Muslim sample. Column (3) refers to the Christian sample and column (4) to the sample of public officials from the local government in Cabo Delgado. Column (5) shows the characteristics of the foreign sample of American students. Notice they replied to an adapted version of the same questionnaire of the Mozambican sample. For obvious reasons we did not collect information about Mozambican ethnicity or basic needs for the American sample.

**Table C1: Demographic characteristics of the main Muslim sample**

	<b>Control group</b>	<b>Any treatment</b>	<b>Religious treatment</b>	<b>Economic treatment</b>	<b>Joint test</b>
	(1)	(2)	(3)	(4)	(5)
	mean	difference	difference	difference	p-value
	[std. dev.]	(std. err.)	(std. err.)	(std. err.)	(N)
Age	24,963 [5,393]	1,437 (0,781)	1,859 (0,925)	1,083 (0,885)	0,131 (241)
Number of adults in the household	3,704 [2,142]	-0,122 (0,32)	-0,087 (0,38)	-0,152 (0,363)	0,916 (241)
Single	0,79 [0,41]	-0,096 (0,061)	-0,105 (0,072)	-0,089 (0,069)	0,28 (241)
Secondary schooling	0,346 [0,479]	0,029 (0,066)	0,065 (0,078)	-0,001 (0,075)	0,626 (241)
Higher education	0,136 [0,345]	-0,023 (0,045)	-0,054 (0,053)	0,002 (0,05)	0,49 (241)
Years of education	10,691 [2,349]	-0,229 (0,343)	-0,637 (0,404)	0,113 (0,386)	0,137 (241)
Ethnic - Macua	0,543 [0,501]	0,063 (0,067)	-0,009 (0,079)	0,123 (0,076)	0,155 (241)
Ethnic - Mwani	0,395 [0,492]	-0,026 (0,066)	0,03 (0,078)	-0,073 (0,075)	0,381 (241)
Employed	0,247 [0,434]	0,059 (0,062)	0,082 (0,073)	0,04 (0,07)	0,536 (241)
Monthly income (meticaiss)	5387,79 [8050,5]	-640,974 (1249,274)	-770,256 (1481,475)	-532,497 (1417,394)	0,866 (241)
Monthly expenditure (meticaiss)	9251,444 [11871,547]	3087,602 (4791,659)	1127,775 (5677,629)	4732,056 (5432,042)	0,661 (241)
Owns assets (0-5)	2,617 [1,22]	-0,155 (0,172)	-0,302 (0,203)	-0,031 (0,195)	0,268 (241)
Piped water	0,494 [0,503]	-0,019 (0,068)	0,054 (0,081)	-0,08 (0,077)	0,232 (241)
Electricity	0,988 [0,111]	-0,031 (0,024)	-0,015 (0,029)	-0,045 (0,028)	0,253 (241)
Missing basics (0-30)	9,014 [8,308]	0,792 (1,151)	1,584 (1,354)	0,136 (1,293)	0,427 (233)

Notes: Column (1) shows the mean for each variable in the control group, with standard deviation in squared brackets. Column (2) shows the coefficient of an OLS regression of each demographic variable on a dummy for any treatment (religious or economic). Columns (3)-(4) show the coefficients of OLS regressions of each demographic variable on each treatment separately. Column (5) shows the results of joint tests of the significance of the treatment coefficients. Ethnic - Mwani and ethnic - Macua are dummies for the two main ethnic groups of the sample. Owns assets is an indicator from 0 to 5 of possession of assets in the household that includes: radio, tv, car, oven and fridge. Missing basics is an indicator of intensity of having no access to basic goods in the previous year, that ranges from 0-30. Basic goods are: food, drinking water, medical care, fuel to cook, and money for other basic needs.

**Table C2: Demographic characteristics of all sub-samples**

	<b>Main muslim</b>	<b>Auxiliary muslim</b>	<b>Auxiliary christian</b>	<b>Auxiliary public official</b>	<b>Auxiliary foreigner</b>
	(1)	(2)	(3)	(4)	(5)
	mean	mean	mean	mean	mean
	(std.dev.)	(std.dev.)	(std.dev.)	(std.dev.)	(std.dev.)
Age	25.917 (5.757)	24.486 (5.059)	24.649 (5.245)	30.763 (3.071)	21.172 (2.522)
Number of adults in the household	3.622 (2.344)	2.568 (1.281)	2.649 (1.136)	2.053 (1.314)	1.333 (1.446)
Single	0.726 (0.447)	0.595 (0.498)	0.865 (0.347)	0.632 (0.489)	0.867 (0.346)
Secondary schooling	0.365 (0.482)	0.297 (0.463)	0.541 (0.505)	0.474 (0.506)	0.000 (0.000)
Higher education	0.120 (0.326)	0.081 (0.277)	0.162 (0.374)	0.447 (0.504)	1.000 (0.000)
Years of education	10.539 (2.513)	10.459 (1.952)	11.676 (1.529)	13.105 (1.485)	14.143 (0.525)
Employed	0.286 (0.453)	0.297 (0.463)	0.162 (0.374)	1.000 (0.000)	0.433 (0.504)
Partial employment	0.162 (0.369)	0.162 (0.374)	0.108 (0.315)	0.105 (0.311)	0.333 (0.479)
Full-time employment	0.124 (0.331)	0.135 (0.347)	0.054 (0.229)	0.895 (0.311)	0.100 (0.305)
Monthly income (USD)	82.704 (152.452)	61.685 (77.185)	50.901 (110.812)	181.186 (185.524)	346.207 (1430.638)
Monthly expenditure (USD)	188.355 (584.923)	137.878 (246.977)	93.707 (77.095)	128.509 (76.729)	712.466 (1829.117)
Ethnic - Macua	0.585 (0.494)	0.919 (0.277)	0.784 (0.417)	0.737 (0.446)	
Ethnic - Mwani	0.378 (0.486)	0.081 (0.277)	0.000 (0.000)	0.053 (0.226)	
Owns assets (0-5)	2.515 (1.262)	2.027 (1.443)	2.378 (1.163)	2.553 (1.350)	
Piped water	0.481 (0.501)	0.649 (0.484)	0.649 (0.484)	0.711 (0.460)	
Electricity	0.967 (0.180)	0.919 (0.277)	0.892 (0.315)	0.868 (0.343)	
Missing basics (0-30)	9.554 (8.172)	9.486 (8.228)	9.000 (10.047)	10.684 (10.172)	
<b>Number of observations</b>	<b>241</b>	<b>37</b>	<b>37</b>	<b>38</b>	<b>30</b>

Notes: Each column presents means and standard deviations for the different demographic characteristics. Ethnic - Mwani and ethnic - Macua are dummies for the two main ethnic groups of the Mozambican sample. Owns assets is an indicator from 0 to 5 of possession of assets in the household that includes: radio, tv, car, oven and fridge. Missing basics is an indicator of intensity of having no access to basic goods in the previous year, that ranges from 0-30. Basic goods are: food, drinking water, medical care, fuel to cook, and money for other basic needs.



#### D. Joy-of-destruction behavior across types of players

Since we have available data for the Joy-of-destruction lab game concerning not only the main Muslim sample but also the auxiliary samples of Muslims, Christians, public officials, and foreigners, we now report on the behavioral differences between the four different types of players. We use all observations we have in the game in the following specification:

$$Y_{l,i} = \alpha + \sigma P_i + \gamma O_i + \delta C_i + \theta X_{l,i} + \varepsilon_{l,i}, \quad (1)$$

where  $P$  is the vector of player types, including the four types of players in the game.

The results are shown in Table D1, for destruction in the lab game (columns 1 and 2), as well as beliefs about destruction by opponents (columns 3 and 4), following specification (1). We employ Muslim subjects as the omitted category. We control in all regressions for the treatment dummies, order dummies, and demographic characteristics. In columns (2) and (4), we add counterpart dummies (again, using Muslims as the omitted category). We employ joint tests of significance of player types, as well as of counterpart types. For each group of dummies, i.e., player or counterpart, we also show tests of differences within each pair of possible types.

Regarding destruction by player types, we can report significantly less destruction for foreigners, who always play the Nash strategy of no destruction, when compared to Muslims. The magnitude of this difference is 17 percentage points, statistically significant at the 1% level. However, and surprisingly, we find a marginally significant difference (at the 10% level) between Muslims and Christians going in the direction of more destruction for the latter. The size of the coefficient is 11 percentage points. Public officials also seem to be more destructive than Muslims, but the difference is not statistically significant at standard levels. When adding counterpart dummies, we observe that subjects are particularly aggressive towards foreigners: the probability of destruction increases by 5 percentage points for these opponents, when comparing to Muslim counterparts (significant at the 5% level).

Effects are generally consistent when looking at beliefs about destruction by opponents. Foreigners believe their opponents will be less destructive, when compared to Muslims: this is an effect of 11 percentage points, significant at the 10% level. Christians and public officials believe their counterparts will be more aggressive, when contrasted to Muslims: they are 21 (Christians) or 11 (public officials) percentage-points more likely to believe their endowments will be destroyed (statistical significance is at the 1 or 10% levels, respectively). In the specification that adds counterpart dummies, we find that

subjects believe public officials and foreigners will be more aggressive towards them than Muslims:  
these are differences of 6 and 7 percentage points (significant at the 5 or 1% levels).

**Table D1: Joy-of-destruction - all players**

	<b>Destruction in the lab game</b>		<b>Beliefs about destruction in the lab game</b>	
	(1)	(2)	(3)	(4)
<b>Player type (omitted=Muslim)</b>				
Christian	<b>0.109</b> <b>(0.063)</b>	<b>0.109</b> <b>(0.063)</b>	<b>0.206</b> <b>(0.066)</b>	<b>0.206</b> <b>(0.066)</b>
Public official	<b>0.045</b> <b>(0.059)</b>	<b>0.045</b> <b>(0.059)</b>	<b>0.109</b> <b>(0.062)</b>	<b>0.109</b> <b>(0.063)</b>
Foreigner	<b>-0.174</b> <b>(0.053)</b>	<b>-0.174</b> <b>(0.053)</b>	<b>-0.108</b> <b>(0.059)</b>	<b>-0.108</b> <b>(0.059)</b>
<b>Counterpart (omitted=Muslim)</b>				
Christian		0.021 (0.021)		0.037 (0.023)
Public official		0.029 (0.025)		0.056 (0.025)
Foreigner		0.053 (0.025)		0.066 (0.024)
Player: Christian=0; official=0; foreigner=0 (p-value)	0.000	0.000	0.000	0.000
Player: Christian=official (p-value)	0.374	0.374	0.225	0.225
Player: Christian=foreigner (p-value)	0.000	0.000	0.000	0.000
Player: official=foreigner (p-value)	0.000	0.000	0.002	0.002
Counterpart: Christian=0; official=0; foreigner=0 (p-value)		0.19		0.041
Counterpart: Christian=official (p-value)		0.704		0.394
Counterpart: Christian=foreigner (p-value)		0.129		0.182
Counterpart: official=foreigner (p-value)		0.236		0.656
Number of observations	1520	1520	1520	1520
R-squared	0.058	0.060	0.072	0.075
Mean dependent variable (omitted player type)	0.172	0.172	0.206	0.206

Notes: This table shows OLS regressions using as dependent variable: (left) a dummy variable taking value 1 when the subject destroys the endowment of his partner in the Joy-of-destruction lab game; (right) a dummy variable taking value 1 when the subject believes his opponent will destroy the subject's endowment in the Joy-of-destruction lab game. We are considering all participants in the lab game. We present the p-value for tests of eight hypotheses. The first set of four relates to coefficients of player type variables: we show results for jointly testing if the three coefficients of the player type dummies are equal to zero; then we show results for testing differences within each pair of player types. The second set of four is analogous and regards counterpart dummies. All regressions include treatment and order dummies, as well as demographic controls. Demographic controls are: age, age squared, years of education, education squared and monthly expenditure. Standard errors are clustered at the individual level and presented in parenthesis.