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Essays in Inequality, Conflict, and Politics

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Abstract

Social inequalities and deficiencies in governance are barriers to the establishment of an inclusive and sustainable society. The first two chapters of this thesis delve into the relationship between different types of inequalities and antisocial behaviors. Specifically, the first chapter uses cross-country and individual approaches to look at the relationship between intergenerational mobility and political violence. The second uses a lab-in-the-field to study the relationship between inequality and antisocial behavior. The third chapter focuses on the cornerstone of democratic governance: voting. Particularly, it uses a randomized controlled trial to study the impact of the distribution of a free newspaper and get-out-the-vote text messages on political behavior.

Keywords: political behavior, information, inequality, antisocial behavior

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Introduction

Equality and good governance are pillars of the Sustainable Development Goals (SDGs). Without these, progress towards an inclusive, cohesive, and sustainable society is hindered.

Some of the societal costs of inequalities are vastly known. From their impact on poverty and social exclusion, to limited access to education and healthcare, as well as limited economic growth. High levels of inequality also have the potential to subvert societal order, namely through higher political instability, protests, and social conflicts. The effect of inequalities on the fabric of society are however dependent on the type of inequality and the type of societal disruption we consider. In the first two chapters of this dissertation, I investigate the relationship between two distinct types of inequality and their effects on disruptive behaviors in society.

In the first chapter I broadly explore the relationship between intergenerational mobility and political violence. I do so employing two distinct approaches.

The first is a cross-country method, where I first estimate wealth and educational intergenerational mobility of 52 developing countries using several rounds of the Demographic and Health Survey (DHS). I then use these estimates to establish a relationship with political violence, as reported by the PRIO IV datasets. The results show a clear significant positive association between low levels of educational intergenerational mobility – the educational level of the parents strongly predicts the educational level of their children – and political violence.

I delve further into the topic, by considering individual perceived levels of intergenerational mobility and, willingness and actual participation in political violence/protests/marches. I do so using the Afrobarometer round 2 survey. These data allow for a distinction between upward and downward intergenerational mobility. Downward intergenerational mobility is significantly and strongly associated with willingness and participation in self-reported political violence/protests/marches.

The two results combined speak to the importance of intergenerational mobility in maintaining a politically stable society. The role of intergenerational mobility has often been overlooked in the literature, often overshadowed by more classical measures of inequality, making this first chapter a contribution to expand the horizons of which inequalities to take into consideration.

Inspired by the results of the first part, the second chapter steps away from the use of secondary data to a more minutely analysis of the relationship between inequality and antisocial behavior. For this work I conducted a lab-in-the field experiment that followed a sample of rural villages in the border region between Guinea-Bissau and Senegal.

In this laboratory experimental setting, individuals played in pairs within the same country and were faced with differing endowment conditions. These conditions allowed varying inequality, exogenously, between players. Specifically, players faced advantaged and disadvantaged inequality conditions.

The outcome measures of this work are centered on antisocial behavior, relying on a standard money-burning game (Zizzo and Oswald, 2001; Abbink and Sadrieh, 2009). In this game,

pairs of players simultaneously choose whether they want to destroy part of their counterpart's endowment at a small price. Moreover, behavioral data on altruism and trust was also collected, as well as a few survey measures of the propensity to justify violent behavior.

The results of this work show a clear effect of inequality on increasing antisocial behavior in the money-burning game. Specifically, there is a statistically significant effect of the difference between disadvantaged and advantaged inequality on decreasing antisocial behavior, when looking at the amount burned of the counterpart's endowment.

These results are in line with the previous chapter showing that deprived positions - be it through downward mobility or disadvantaged endowments - lead to more disagreeable behaviors. It seems imperative then, to create tools to reduce these distances between individuals and societies. At the same time, it is also necessary to put forward systems that augment the voices and mechanisms that people might need to influence policies.

With this in mind, the third chapter focuses on the cornerstone of democratic governance: voting. Specifically, it shows the results of a field experiment conducted during the 2013 municipal elections in Mozambique.

In this chapter, I study the impact on political behavior of location-level distribution of a free newspaper and get-out-the-vote text messages aimed at mobilizing voters. Additionally, we randomly assigned peers to experimental subjects in order to test for peer influence via text messages.

The outcome measures of the political behavior come from official electoral results at the level of the polling station, and from a range of behavioral and survey-based measures.

The results of this work show that the distribution of the newspaper increased turnout and voting for the ruling party. The text messages led to higher political participation. When turning to influencing peers, we observe a clear role of male and older individuals, as well as complementarity with the distribution of newspapers. These forms of voter mobilization and education seem therefore to be positive tools for increasing political participation.

Chapter 1

Intergenerational mobility and political violence: A cross-country and individual approach

1.1.Introduction

Interest in the causes of conflict is as old as Plato and Aristotle. The later rooted civil unrest within the Athenian society in three fundamental causes: “i) the unequal nature of Athenian society, ii) frustration with the weakness and incompetence of Athens’ leaders and iii) the desire for the wealth and privilege that holding political office may entail” (Jacoby, 2008, p.10). All three ideas have been explored by economics using different datasets and methodologies with the intent to explain political violence. This paper contributes to the literature on understanding the causes of political violence. In detail, it focuses its efforts in entering the debate of societal inequality as a source of political violence. Namely, it focuses on accessing the role played by intergenerational immobility in explaining political violence.

1.2.Related Literature

Seminal work by Collier and Hoeffler (1998; 2004) shows that greed rather than grievance explains rebellion. They find that economic factors, particularly the ability to finance and organize a rebellion (captured by the existence of natural resources, as well as economic growth and male secondary education enrollment) strongly predict the outbreak of a civil war. Fearon and Laitin (2003) conclude that proxies for political grievances such as ethnic and religious diversity have little explanatory power in predicting the onset of a civil war. Additionally, proxies for state institutional capacity and strength (most importantly measured

by per capita income) are considered robust predictors of civil war. Montalvo and Reynal-Querol (2005) who study the relationship between conflict and ethnic polarization (introduced in the theoretical work of Esteban and Ray, 1994, 1999) provide significant support for “deep cleavages” along large group lines to affect conflict. Esteban, Mayoral and Ray (2012) draw from the theoretical work of Esteban and Ray (2011) to study the impact of ethnic divisions on conflict. More specifically, they look at polarization, fractionalization and the GiniGreenberg index, and link them to conflict intensity finding significant evidence that these distributional measures matter for conflict. Additionally, Dixon (2009), provides an overview of other explanatory variables that have been considered as correlates of conflict such as population, geographical and environmental variables.

Inequality has been highly disregarded as a consistent way to explain conflict. Despite the great number of approaches undertaken in order to identify the role of inequality in political violence, it is not clear that inequality (traditionally measured by the Gini index) has a correlation with conflict. Explanations in the literature for the nonexistence of this relation draw for reasons such as the lack of good measurement and availability of data for inequality. Moreover, discussions on the explanatory power of different types of inequality, e.g. vertical inequality, horizontal inequality, inequality within the same group, for political violence seem to play an important role. It is within this context that the measurement of intergenerational mobility, i.e., the way that inequality persists across generations, plays in the incidence and magnitude of political violence.

1.3.Cross-country approach

1.3.1. Estimates of Mobility

1.3.1.1.Dataset

The dataset that allows for the construction of these measures of mobility is the Demographic and Health Surveys (DHS). The DHS Program is a household survey conducted consistently and periodically across different countries since 1984, enabling cross country comparisons. I use phases two through two six (1991-2015) of the DHS survey.

The structure of the dataset allows for the collection of information on an individual's wealth and characteristics provided he is the head of the household, as well as individual characteristics of other members of the household. More specifically, information collected on the individuals' wealth is constituted by household characteristics and ownership of goods (source of drinking water, location of water source, toilet facilities, material of construction of the roof-top, number of rooms in the household per person, electricity, radio, television, mobile-phone, refrigerator, bicycle, motorcycle and car). The relevant individual characteristics provided for both head of household and other members of the household are age, education, and type of location of residence (urban or rural). This dataset allows for estimation of both intergenerational wealth mobility and intergenerational educational mobility.

1.3.1.2.Methodology

The most common measurement of intergenerational immobility is often done through intergenerational elasticity (IGE) which is provided by the following equation:

$$y_i^{children} = \alpha + \beta y_i^{parents} + \varepsilon_i \quad (1)$$

where $y_i^{children}$ is logarithm of life-time earnings of the children, $y_i^{parents}$ is logarithm of life-time earnings of parents, α is a constant, ε_i is the error term and β is the measure of intergenerational mobility (IGE). When β is zero, life-time earnings of the children do not depend on the parents' life-time earnings (full mobility); when β is one, life-time earnings of the children depend fully on the life-time earnings of the parents (no mobility).

Recurrent issues in the intergenerational mobility literature related with data availability and fitness of survey method impede the estimation to be done as described above. The two-sample instrumental variables (TSIV) estimator firstly described in Angrist and Krueger (1992) is a broadly accepted method that mitigates data restriction issues. More specifically, this chapter uses the two-sample two-stage least squares estimator (TS2SLS) first used by Björklund and Jäntti (1997) to estimate intergenerational mobility, that was massively adopted in the intergenerational mobility literature. This method is asymptotically more efficient (Inoue and Solon, 2010), and computationally easier than TSIV.

The TS2SLS estimation relies on two distinct samples. A sample of individuals (secondary sample) that constitute a set of pseudo-parents, used to predict life-time earnings of an individual with a given set of characteristics. A second sample of individuals (main sample) that constitute the children that report on their own earnings and characteristics, as well as their parents' characteristics.

Provided the structure and content of the DHS dataset the two samples for the estimation of intergenerational mobility through TS2SLS are obtained by splitting the overall sample into two. The secondary sample is constituted by individuals born before 1960 that are heads of

household (pseudo-parent). The main sample is constituted by individuals born after 1960 that are heads of household and whose parents live in the household (children). The wealth of the individual is used as a proxy for its life-time earnings.

Equations 2, 3, 4 and 5 are the sequence of specifications that allow for estimation of intergenerational immobility. Let $wealth_j^{pseudo-parent}$, be wealth of an individual in the secondary sample. Let $\widehat{wealth}_i^{parent}$ be the predicted wealth of the parent of the individual in the main sample. Let $wealth_i^{children}$ be wealth of an individual in the main sample. Let $X_j^{pseudo-parent}$ and X_i^{parent} be a vector of characteristics, namely age, education, gender and a dummy for urban location of the household of an individual.

$$wealth_j^{pseudo-parent} = \gamma_0 + \gamma_1 X_j^{pseudo-parent} + \varepsilon_j \quad (2)$$

$$\widehat{wealth}_i^{parent} = \alpha + \theta X_i^{parent} + \varepsilon_i \quad (3)$$

$$wealth_i^{children} = \alpha + \delta \widehat{wealth}_i^{parent} + \mu_i \quad (4)$$

$$wealth_i^{children} = \alpha + \delta \widehat{wealth}_i^{parent} + \vartheta X_i + \varphi_i \quad (5)$$

δ is the estimated measure of intergenerational association of wealth between children and parents; when equal to zero it means full mobility, and when equal to one it means there is no mobility.

An additional measure of mobility, that has more widely available data is the extent to which parents' and children's education levels are related. Following a similar approach to the one described above for the intergenerational transmission of wealth, I estimate the intergenerational transmission of education. Assuming that years of schooling as the same mean across nations and generations, educational persistence can be measured using the intergenerational coefficient.

$$education_i^{children} = \alpha + \delta education_i^{parent} + \varepsilon_i \quad (6)$$

$$education_i^{children} = \alpha + \delta education_i^{parent} + \vartheta X_i + \varepsilon_i \quad (7)$$

As in the previous case, δ is the estimated measure of intergenerational association of education between children and parents; when equal to zero it means full association, and when equal to one it means there is no association. For both the wealth and educational immobility estimation, δ is the value that is used for the analysis of the relationship of immobility and political violence in the next stage.

1.3.1.3. Wealth and education mobility

Table 1 presents descriptive statistics of the samples used to do the estimation of both intergenerational wealth immobility and intergenerational educational immobility. Table 1 makes use of the full samples (aggregated by country and year). As expected, by construction of the samples used, the average characteristics of Pseudo-Parents, Parents and Children are different, with the exception of the living location of the individuals. Looking at the

Education variable, we can see that on average there is an overall increase of years in schooling across time.

Table 2 provides an example of the first stage of Intergenerational Wealth Mobility estimation. The choice of the country that is shown as an example followed simply alphabetical order. The DHS survey in Burkina Faso was available in four years, however this number varies across countries. For some countries only one round is available, hence the use of these estimations in the next step is as cross sectional data.

Table 1 - DHS descriptive statistics

	Pseudo- Parent	Parent	Children
	(1)	(2)	(3)
Wealth	0.02	--	-0.07
	(1.92)	--	(1.84)
Gender	0.72	0.12	0.83
	(0.45)	(0.33)	(0.38)
Age	58.56	63.96	34.44
	(11.78)	(10.97)	(7.59)
Education	4.13	1.42	6.10
	(4.76)	(2.97)	(5.05)
Urban	0.39	0.36	0.36
	(0.49)	(0.48)	(0.48)
Number of observations	828149	49265	49267

Note: Wealth, wealth score obtained through principal component analysis. Gender, dummy variable equal to 0 if individual is female and equal to 1 if individual is male. Age, age of an individual measured in years. Education, education of an individual measured in years. Urban, dummy variable, 1 if individual lives in an urban area and 0 if it lives in a rural area. First row means, Second row (in parenthesis) standard deviations. * significant at 10%; ** significant at 5%; *** significant at 1%

This estimation was done as demonstrated by Equation 2. Gender is a dummy variable equal to 0 if individual is female and equal to 1 if individual is male. Age of an individual measured in years. Education of an individual measured in years. Urban is a dummy variable equal to 1 if individual lives in an urban area and 0 if it lives in a rural area.

Table 2 - First-step estimation (Burkina Faso)

	Pseudo-Parent's wealth			
	1993	1999	2003	2010
	(1)	(2)	(3)	(4)
Gender	0.122	0.118	0.120*	0.089
	(0.06)	(0.07)	(0.05)	(0.05)
Age	-0.003**	-0.003*	0.000	-0.004*
	(0.00)	(0.00)	(0.00)	(0.00)
Education	0.202***	0.174***	0.177***	0.191***
	(0.01)	(0.01)	(0.01)	(0.01)
Urban	1.466***	1.807***	1.745***	1.429***
	(0.04)	(0.06)	(0.05)	(0.04)
Constant	-1.706	-1.669	-1.793	-1.354
R-squared adjusted	0.636	0.636	0.539	0.478
Number of observations	3658	2841	4873	5076

Note: Gender, dummy variable equal to 0 if individual is female and equal to 1 if individual is male. Age, age of an individual measured in years. Education, education of an individual measured in years. Urban, dummy variable, 1 if individual lives in an urban area and 0 if it lives in a rural area. First row means, Second row (in parenthesis) standard deviations. * significant at 10%; ** significant at 5%; *** significant at 1%

The intermediate step between Table 2 and Table 3 is the prediction of wealth of the parents. This is done as shown by Equation 3. Table 3 then provides the second stage regression. Column 1 is equivalent to Equation 4, while Column 2 is equivalent to equation 5. As previously we show results for the four years available in Burkina Faso. As previously mentioned, the first row is the value that will transition to the next stage of this work. Taking

as an example the first estimation presented in Table 3, we can interpret it as, on average, ceteris paribus an increase of one unit in the wealth score of the predicted parents wealth will lead to an increase of 1.33 units in the wealth score of its parents. This value is significant across almost all estimations presented.

Table 3 - Intergenerational wealth mobility estimation (Burkina Faso)

	Children's wealth							
	1993		1999		2003		2010	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Pseudo-Parents' wealth	1.333*** (0.16)	-0.131 (0.49)	0.967*** (0.11)	- 1.894*** (0.33)	1.110*** (0.09)	1.275** (0.44)	0.941*** (0.08)	0.406 (0.29)
Constant	0.863	-2.142	0.181	- 7.686	0.446	0.083	0.222	-2.505
R-squared adjusted	0.498	0.584	0.520	0.587	0.429	0.517	0.253	0.410
Number of observatio	105	105	211	211	415	415	719	719
Individuals controls	no	yes	no	yes	no	yes	no	yes

Note: Individual controls are: Gender, dummy variable equal to 0 if individual is female and equal to 1 if individual is male. Age, age of an individual measured in years. Age squared, age of an individual measured in years squared. Education, education of an individual measured in years. Urban, dummy variable, 1 if individual lives in an urban area and 0 if it lives in a rural area. First row means, Second row (in parenthesis) standard deviations. * significant

Next, in Table 4, I present an example for the estimation intergenerational educational immobility following Equations 6 and 7. In similar fashion, let us interpret the coefficient estimated in the first row and column in Table 4. The interpretation of this coefficient is the following: on average, for each additional year of education of the parents, the amount of years of education of the children varies by 0.815 years, ceteris paribus. Again, this value is significant across almost all estimations done.

A simple correlation between the two measures (without any controls shows that they are positively correlated at a 10% level.

Table 4 - Intergenerational educational mobility estimation (Burkina Faso)

	Children's education			
	1993		1999	
	(1)	(2)	(3)	(4)
Parents' education	0.815*** (0.23)	0.837*** (0.25)	0.754 (0.67)	0.516 (0.55)
Constant	1.288	4.54	1.121	7.36
R-squared adjusted	0.047	0.116	0.006	0.038
Number of observations	391	391	408	408
Individuals controls	no	yes	no	yes
Parent controls	no	yes	no	yes

Note: Individual controls are: Gender, dummy variable equal to 0 if individual is female and equal to 1 if individual is male. Age, age of an individual measured in years. Age squared, age of an individual measured in years squared. Education, education of an individual measured in years. Urban, dummy variable, 1 if individual lives in an urban area and 0 if it lives in a rural area. Parent controls are: Gender, dummy variable equal to 0 if individual is female and equal to 1 if individual is male. Age, age of an individual measured in years. Age squared, age of an individual measured in years squared. First row means, Second row (in parenthesis) standard deviations. * significant at 10%; ** significant at 5%; *** significant at 1%

1.3.2. Intergenerational mobility and political violence

1.3.2.1. Dataset and estimation

To understand the relationship between Political Violence and the measures of immobility estimated in the previous section the Center for Systemic Peace, Major Episode of Political Violence (MEPV) dataset was used. A MEPV is defined “by the systematic and sustained use of lethal violence by organized groups that result in at least 500 directly related deaths

over the course of the episode”¹. The MEPV dataset contains information from 1946 until 2015 on magnitude scores of MEPV for all countries. The information contained in this dataset is transformed into a dummy variable that reports simply the existence or not of a MEPV by country and year.

The World Development Indicators (WDI) dataset is used to obtain information on, i) GDP per capita and ii) Urban Population. Fearon and Laitin (2003) is used to obtain data on percent of mountainous terrain.

The effect of interest (β) can be estimated through the equation:

$$political_violence_i = \alpha + \beta mobility_i + \gamma X'_i + \varepsilon_i \quad (8)$$

The measures used for *political_violence_i* are two. On the one hand I first use an extensive margin approach, in which I look at the occurrence or not of a MEPV. To do so, a maximum likelihood in a logit specification is used. On the other hand, I make use of the magnitude scale of violence of this dataset to look at an intensive margin approach. To do so, I make use of an OLS regression. The *mobility_i* variables concern the estimation done above. Therefore, we will see intergenerational mobility of wealth and intergenerational mobility of education both used as independent variables. I make use of all the estimates previously obtained to gain robustness in the results presented.

1.3.2.2.Results

¹ For more information see <http://www.systemicpeace.org/inscr/MEPVcodebook2014.pdf>, page 2

Table 5 reports the results with respect to Equation 8. As can be seen for both measures of Political Violence, wealth mobility presents a positive sign with respect to political violence, on average, ceteris paribus. This is however not statistically significant.

Table 5 - Intergenerational mobility and political violence

	MEPV			
	Extensive Margin		Intensive Margin	
	(1)	(2)	(3)	(4)
Wealth mobility	0.286 (0.28)		0.062 (0.10)	
Educational mobility		1.635* (0.69)		0.652* (0.26)
GDP per capita	-0.095 (0.08)	0.490 (0.06)	-0.024 (0.02)	0.008 (0.03)
Population total	0.000** (0.00)	0.000** (0.00)	0.000** (0.00)	0.000** (0.00)
Surface	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)
Constant	-1.791	-2.651	0.558	0.244
R-squared adjusted	0.222	0.260	0.289	0.413
Number of observations	108	121	108	121

Note: Individual controls are: Gender, dummy variable equal to 0 if individual is female and equal to 1 if individual is male. Age, age of an individual measured in years. Age squared, age of an individual measured in years squared. Education, education of an individual measured in years. Urban, dummy variable, 1 if individual lives in an urban area and 0 if it lives in a rural area. Parent controls are: Gender, dummy variable equal to 0 if individual is female and equal to 1 if individual is male. Age, age of an individual measured in years. Age squared, age of an individual measured in years squared. First row means, Second row (in parenthesis) standard deviations. * significant at 10%; ** significant at 5%; *** significant at 1%

When looking at the additional measure of mobility, we can see that educational mobility has a positive significant link to both the occurrence of a MEPV and its magnitude at a 10% level of significance.

1.4. Individual approach

1.4.1. Dataset and estimation

The Afrobarometer dataset provides micro-level information on “...the social, political, and economic atmosphere in Africa”². Round two (2004) of the Afrobarometer dataset is used³.

More specifically, the information is provided by the following questions: i) “on a scale between 0 and 10, where 0 are “poor” people and 10 are “rich” people: Which number would you give your parents ten years ago?”, ii) “on a scale between 0 and 10, where 0 are “poor” people and 10 are “rich” people: Which number would you give yourself today?”, iii) “on a scale between 0 and 10, where 0 are “poor” people and 10 are “rich” people: Which number do you expect your children to attain in the future?” and iv) “... please tell me whether you, personally, have done any of these things during the past year. If not, would you do this if you had the chance: Used force or violence for a political cause?”

The first three questions provide a way to estimate the self-reported intergenerational mobility. The fourth question provides information on self-reported use of violence due to political reasons⁴.

² For more information see: <http://www.afrobarometer.org/>

³ To avoid different cultural settings for women only men are considered.

⁴ Countries for which this dataset was complete and available are: Botswana, Cape Verde, Ghana, Kenya, Lesotho, Malawi, Mali, Mozambique, Namibia, Nigeria, Senegal South Africa, Uganda and Zambia.

The relationship between self-reported intergenerational mobility and self-reported use of violent behavior due to political reasons is given by the following equation:

$$political_violence_i = \alpha + \beta mobility_i + \delta X'_i + \gamma X'_i + \varepsilon_i \quad (9)$$

political_violence_i is an ordered categorical variable of self-reported use of violence due to political reasons (0=No, would never do this, 1=No, but would do if had the chance, 2=Yes, once or twice, 3=Yes, several times, 4=Yes, often). *mobility_i* is the difference between self-reported current well-being of an individual and the well-being of its parents/children 10 years ago (integer scale between -10 and 10; -10=an individual is 10 times worse than its parents/children, 0=an individual has the same well-being as his parents, 10=an individual is 10 times better than his parents/children). X_i is a vector of individual characteristics⁵ and X_i is a vector of location controls. The regressions are run with country fixed effects. The standard errors are clustered a region level.

1.4.2. Results

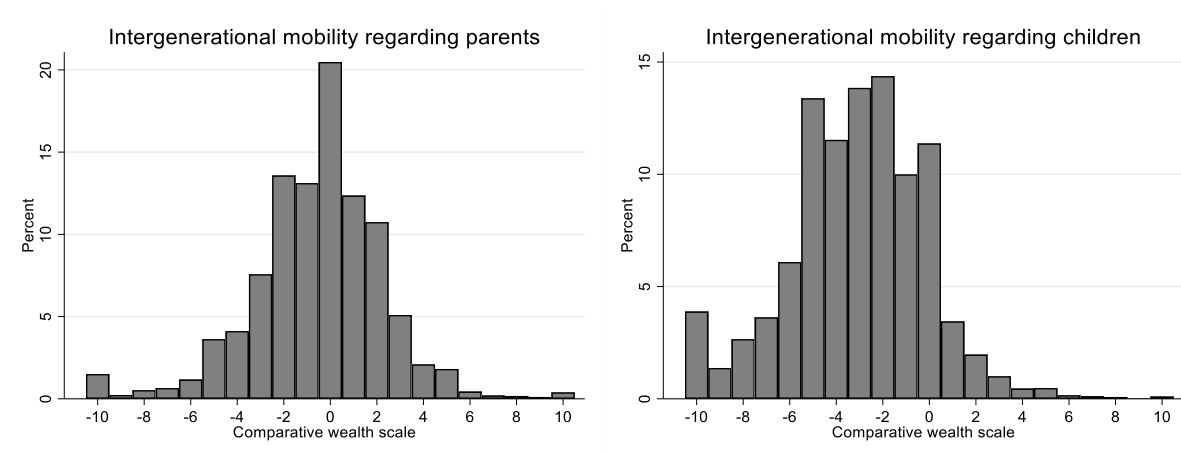
1.4.2.1. Distribution of mobility

Figure 1 below shows the distribution of mobility computed using the variables described above. As we can see in panel A, the distribution of believes about mobility follows approximately normal distribution. Approximately 21% of individuals believe that they are as well-off as their parents 10 years ago. Forty-six percent believe that they are worse-off

⁵ Individual control variables: age, head of household dummy, urban dummy, no schooling (base category), complete primary schooling, complete secondary schooling, higher education, no employment (base category), part time employment, full time employment, income (first quintile), income (second quintile), income (third quintile) (base category), income (fourth quintile), income (fifth quintile). ¹³ Location control variables: dummy for school, dummy for police station, dummy for piped water, dummy for electricity grid, dummy for health clinic, dummy for sewage.

than their parents 10 years ago, and 33% believe that they are better-off. Regarding panel B, we see a skewed distribution, where a clear majority of parents believe that their children will be better-off than them 10 years in the future.

Figure 1 – Distribution of intergenerational mobility



1.4.2.2.Intergenerational mobility and political violence

Table 6 below shows the results regarding equations 9 and 10 described above.

Let’s first look at the results provided by Panel A, that describe the results of the relationship between an individual and their parents. The defined variable mobility is statistically significant at a 5% level. This result shows us that the absolute distance in wealth between individuals and their parents increases the reported use of force for political reasons. A breakdown of this result can be seen in columns (2) and (3) of the table, where its blatant that the effect is solely driven by individuals that experience downward mobility.

Table 6 - Individual intergenerational mobility and political violence**Panel A - Intergenerational mobility regarding parents**

Dependent variable -->	Political violence		
	(1)	(2)	(3)
Mobility	0.006** (0.003)		
Upward mobility		0.006 (0.004)	
Downward mobility			0.006** (0.003)
Constant	0.217	0.222	0.189
R-squared adjusted	0.012	0.013	0.011
Number of observations	16,407	8,964	10,689

Panel B - Intergenerational mobility regarding children

Dependent variable -->	Political violence		
	(1)	(2)	(3)
Mobility	0.001 (0.003)		
Upward mobility		0.013 (0.008)	
Downward mobility			0.001 (0.003)
Constant	0.232	0.205	0.218
R-squared adjusted	0.012	0.029	0.010
Number of observations	15,618	2,935	14,394
Individual controls	yes	yes	yes
Location controls	yes	yes	yes
Country FE	yes	yes	yes

Note: OLS regressions. Dependent variable ordered categorical variable on self-reported use of violence due to political reasons (0=No, would never do this, 1=No, but would do if had the chance, 2=Yes, once or twice, 3=Yes, several times, 4=Yes, often). Mobility is defined the absolute difference between self-reported current wellbeing of an individual and the well-being of its parents(panel A)/children(panel B) 10 years ago/in the future (integer scale between 0 and 10; 0=an individual has the same well-being as his parents/children, 10=an individual is 10 times worse/better than his parents/children). Standard errors are clustered by region. All regressions have country fixed effects, location and individual controls. Individual controls are: gender, age, household size, schooling, employment status. * significant at 10%; ** significant at 5%; *** significant at 1%

Looking now at Panel B, that reports the relationship between parents and their children, we see that there are no significant results. A potential reason for this is the fact that as observed before there are no expectations of downward mobility with regards to their own children.

1.5.Conclusion

This paper had as its main objective to introduce intergenerational mobility has a source of political violence. To do so, there were two steps. The first was the construction of intergenerational immobility measures. Even though most typically intergenerational mobility is measured through life-time income, I proxy this variable by two: the first a measure of Intergenerational Wealth Association, and second a measure of Intergenerational Educational Association. Then, making use of these two variables, I look at the relationship between Political Violence and Immobility. Both measures present a positive sign, which implies that a more immobile society leads to a higher probability of a MEPV occurring, and the magnitude score of that event being higher. However, only Educational Immobility is statistically significant. A second approach was also taken that considers Afrobarometer microdata. This last analysis made clear that the relationship between mobility and political violence is better analyzed decomposing the effect of mobility into upward and downward mobility.

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Chapter 2

Inequality and antisocial behavior:

An experiment in West Africa

2.1.Introduction

Within-country inequality has risen dramatically in the past 20 years (World Inequality Report, 2022). In Sub-Saharan Africa, the share of income of the households in the richest decile was 55.8% in 2021⁶, ranging from 39.1% (São Tomé e Príncipe) to 66.5% (South Africa). There is some evidence that unequal societies struggle more with sustained economic growth than societies with lower inequality: excessive inequality can lead to weak economic performance (Cingano, 2014; Stiglitz, 2016; Berg and Ostry, 2017) as well as financial instability (Galbraith, 2012; Engelbert, 2015). Moreover, unequal societies tend to be less effective at reducing poverty (UNDESA, 2020; Bergstrom, 2020).

At the same time, there is a generalized concern, namely from the policy community, that rising inequality plays a role in social discontent and can lead to violent conflict (UNDESA, 2020; World Bank, 2020). Still, empirical studies on the role played by inequality in triggering social discontent and violent conflict have led until now, at the very best, to mixed results (Alesina and Perotti, 1996; Collier and Hoeffler, 2004; Østby, 2013). Several critiques

⁶ For comparison, in 2021, the share of income of the top ten percent richest households in Latin America was 57.9%. For Europe this value was 35.8% and 45.7% for North America.

and approaches to explain this lack of consistent results have emerged. First, measuring inequality is difficult and this could lead to poor data quality (Cramer, 2003).⁷ Second, different authors have emphasized the role of horizontal inequalities between groups, as opposed to the traditional vertical inequality between individuals (Montalvo and Reynal-Querol, 2005; Esteban et al., 2012).⁸ Third, perceived inequality could be more important than actual levels of inequality. Individuals have limited understanding about actual levels of inequality, how they evolve over time, and where they fit in the income distribution (Norton and Ariely, 2011; Cruces et al., 2013).⁹

In this paper we ask what the effect of inequality is on antisocial behavior in the border region between Senegal and Guinea-Bissau. We employ a laboratory experimental setting in which subjects play in pairs within the same country and are faced with differing endowment conditions. These conditions allow varying inequality, exogenously, between players. Specifically, players face advantageous and disadvantageous inequality conditions. Players are told that their counterpart is a citizen of their country. Our outcome measurements are centered on antisocial behavior, relying on a standard money-burning game (Zizzo and Oswald, 2001; Abbink and Sadrieh, 2009). In this game, pairs of players simultaneously

⁷ In recent years there has been a significant effort to improve data availability and quality. An example of this effort is the World Top Incomes Database, that was launched in 2011 to provide free access to all existing time series data on inequality. This has then evolved into the World Inequality Database launched in 2017.

⁸ Stewart (2008) brought forward the role of horizontal inequalities as a source of injustice and political mobilization. Horizontal inequalities have been shown to be associated to increasing the onset of conflict (Østby et al, 2009), the onset civil conflict (Østby, 2008) and the onset of civil war (Cederman et al., 2011).

⁹ Consistent with this limitation, there is some evidence that perceptions of disadvantageous economic changes (Bartusevičius and Van Leeuwen, 2022) and perceptions of inequality (Gimpelson and Treisman, 2018) motivate violence.

choose whether they want to destroy a part of their counterpart's endowment at a small price. In this setting, antisocial behavior can be understood as extreme, also because it is not Nash equilibrium behavior. We also collect behavioral data on altruism and trust, as well as a few survey measures of the propensity to justify violent behavior.

Importantly, our data were collected in a sample of rural villages along the border between Senegal and Guinea-Bissau. This is a homogeneous setting dominated by one main ethnic group on both sides of the border and with frequent family relationships between both sides of the border. Our specific subjects were sampled from the social network of a local association that brings together the sampled villages from both sides of the border. At the same time, there is one very important difference between Senegal and Guinea-Bissau, particularly in this border region: there has been a long-lasting conflict situation in the Senegal side, commonly understood as the Casamance region, where local rebels have been fighting for that region's independence. One possibility is that this conflict situation has been driven by inequality. While exploring the natural variation offered by this setting, we ask whether subjects are more antisocial and respond more to inequality in Senegal than in Guinea-Bissau.

We find clear effects of inequality on increasing antisocial behavior in the money-burning game. Specifically, we find a statistically significant effect of the difference between disadvantageous and advantageous inequality on decreasing antisocial behavior, when looking at the amount burned of the counterpart's endowment employing both the full sample and a restricted sample of individuals that burned a positive amount. For example, the amount burned decreases from 214 CFA (0.32 USD) to 142 CFA (0.21 USD) when changing

inequality from disadvantageous to advantageous. When looking at the restricted sample of individuals that burned a positive amount, we also find that subjects in Senegal behave in a more antisocial manner when compared to those in Guinea-Bissau, and that they are more responsive to inequality. Specifically, the difference between disadvantageous and advantageous inequality decreases more antisocial behavior in Senegal than in Guinea-Bissau. We also confirm that subjects report more often violence to be justified in Senegal than in Guinea Bissau. Finally, we find some evidence that trust but not altruism could mediate the effects of inequality on antisocial behavior.

Our paper relates to the lab experimental literature on negatively interdependent preferences, namely showing that individuals dislike the wealth of others sufficiently to allocate their own resources to destroy others' wealth (Zizzo and Oswald, 2001; Abbink and Sadrieh, 2009; Abbink et al., 2018; Fehr, 2018; Bigoni et al., 2021).¹⁰ These studies have shown that antisocial behavior is a common phenomenon, and that it is more widespread among individuals that are or become materially disadvantaged than among those that are or become advantaged.

This paper contributes to this literature by conducting a lab-in-the-field experiment on the relationship between inequality and antisocial behavior in the border region between Guinea-Bissau and Senegal. In other words, our study takes a known lab technology on the role of inequality in determining antisocial behavior to a real-life conflict setting. In this regard, our study is similar to the work of Prediger (2014) and Vicente and Vilela (2020), who conduct

¹⁰ From a neuroeconomic perspective, Tricomi et al. (2010) shows neural evidence of a dislike for unequal outcomes, consistent with inequality averse models.

money-burning games in specific field settings.¹¹ The rich setting that the border between the two countries provides allows hinting at whether inequality could be a major driver of conflict in Senegal. Therefore, this paper contributes as well to the vast literature that uses borders as a source of institutional variation to look at economic outcomes, see McCauley and Posner (2015) for a review.

The paper is organized as follows. In section 2 we present the context of our lab-in-the-field experiment. In section 3 we develop the experimental design, detailing the “money-burning” game, the experimental treatment, measurement, estimation strategy, as well as hypothesis. The following section discusses the econometric results, namely of the experimental variation of inequality as well as cross border differences, and interactions between the two. Section 5 concludes.

2.1. Context

The context of our study is the border of Senegal with Guinea-Bissau in West Africa. The Republic of Senegal has 16.7 million inhabitants, a quarter of whom live in the Dakar region (0.3% of the territory). It has a current GDP per capita of 1606.5 USD.¹² Guinea-Bissau borders Senegal to the north and Guinea to the south and east, with approximately 1.9 million individuals. It is a fragile country with a current GDP per capita of 813 USD.¹³ The region of Senegal, Gambia, and Guinea-Bissau has a common history. Most common accounts of

¹¹ Prediger et al. (2014) explore the effects of resource scarcity on antisocial behavior among pastoralists in Namibia. Vicente and Vilela (2020) studied the impact of religious sensitization on antisocial behavior in Northern Mozambique.

¹² <https://www.worldbank.org/en/country/senegal/overview> – visited September 25, 2022

¹³ <https://www.worldbank.org/en/country/guineabissau/overview#3> – visited September 25, 2022

this region start as early as the 4th century CE. The Mali Empire, one of the most prominent empires of West Africa between the 13th-17th century, largely influenced the culture of the region though language, laws and customs. French, English, and Portuguese forces competed for the southernmost part of the region to secure their own regional sources of slaves. In 1851, the French expelled the Portuguese into what is now known as Guinea-Bissau and colonized the southern region of contemporaneous Senegal.

Importantly for our project, the region of Senegal south of Gambia, Casamance, has been the stage of an armed conflict waged between the Government of Senegal and the Mouvement des Forces Démocratiques de la Casamance¹⁴ (MFDC). Historically, the MFDC was created as a political party in 1947, with the objective of representing the interests of the region of Casamance. Importantly, one of the reasons for this movement is the unequal treatment between the individuals in the region of Casamance and the rest of the country. Specifically, there is a sense that the people in the region do not benefit themselves from the region's richness and that most earning go to the capital of Senegal (Uppsala Conflict Data Program, 2022). The movement regained strength in 1982 with a demonstration in favor of secession from Senegal, which started armed conflict. This conflict has produced already 1489 deaths (Uppsala Conflict Data Program, 2022). Guinea-Bissau has not had armed conflict after independence in 1974, except for a short spell in the aftermath of a *coup d'état* in 1998, concentrated in the region of the capital city Bissau. Still, Guinea-Bissau has seen many episodes of political instability and forced transitions of political power since independence.

¹⁴ Which translates to Movement of Democratic Forces of Casamance.

2.2. Experimental Design

2.2.1. Border

The setting of our project is a sample of villages in the border between Senegal and Guinea-Bissau. This is a homogeneous setting dominated by the Jola ethnicity. This ethnic group is spread across the territories of The Gambia, Guinea-Bissau and Senegal as shown in Figure A1 of the Appendix A taken from Baum (1999). While the border between Senegal and Guinea-Bissau was established by the European in the aftermath of the Berlin conference of 1884, it cut the Jola settlement in half (Tomàs, 2020), dividing a region that was united by religious, political, and economic ties. Using the 2018 Living Standards Measurement Survey (LSMS), we can see the predominance of the Jola in the current respective districts on the two sides of the border, Oussouye (Senegal) and São Domingos (Guinea-Bissau). Specifically, in Oussouye 86% of the heads of household of the sampled population is Jola, while in São Domingos this value is 59.3%.

On top of the homogeneity brought by the Jola ethnicity, our sample of villages follows the coverage of a local civic association that brings together both sides of the border. This is the Senegalese-Guinean Alliance for Peace and Integration. The main objectives of this association relate to maintaining contact between the villages, in order to represent these communities together in face of the formal institutions of both countries, organizing annual reunions, and pursuing activities that promote economic development on both sides of the border.¹⁵ Importantly, many of these villages have intense kinship relationships between both

¹⁵ Examples of these activities include football championships, dike construction, and plantation of vegetation.

sides of the border. Specifically for the sample of the study, 95% of individuals in Guinea-Bissau claim to have family on the Senegalese side of the border.¹⁶

While there is clear homogeneity in the setting of our study in terms of ethnicity and even kinship, there are important differences relating to conflict and inequality. The long-standing Casamance conflict situation is a major local difference between the two sides of the border. Within-country views about economic conditions are also quite different between the two sides of the border. Figure A2 in the Appendix compares views about living standards in the bordering districts of Oussouye and São Domingos. We observe that, while perceptions about the country's level of poverty, the relative local standard of living, and own individual poverty, are generally similar on both sides of the border, there are much starker differences between the views of local residents on the Senegalese side and average citizens of Senegal, than between the corresponding difference in Guinea-Bissau. This is suggestive that views about within-country inequality are very different between the two sides of the border.

2.2.2. Game

Antisocial behavior has been defined in the literature as a desire to harm others at a cost to oneself in the absence of motives of reciprocity (Prediger et al., 2014). We measure antisocial behavior through a behavioral game, namely a variation on a “money-burning” game, that was first introduced by Zizzo and Oswald (2001) and further formalized by Abbink and Sadrieh (2009) as the “Joy of Destruction” game. These “money-burning” games are standard in the literature to measure antisocial behavior, as they focus on measuring and analyzing

¹⁶ In Senegal, 64% of individuals report having family on the Guinea-Bissau side of the border.

spiteful or ‘nasty’ behavior of individuals. In brief, these games are used as proxies for real live examples of antisocial behavior such as violence, vandalism, computer viruses (Abbink and Sadrieh, 2009).

Individuals play a one-shot, simultaneous game, where the identity of participants is kept anonymous. The structure of the game is as follows: i) individuals are given an endowment; ii) they are then paired with a random anonymous individual, that also has an endowment; and iii) they then choose how much to burn/destroy of the individual’s endowment, at a certain cost. The unique Nash equilibrium of this game is not to burn any endowment.

We introduce experimental variation in the game by randomly creating three different groups. In the first group, named “no inequality”, individuals are matched with someone that has the same initial endowment for the game as them. Specifically, both the individual and the partner receive an endowment of 1000 CFA (1.48 USD). In the second group, named “disadvantageous inequality”, individuals are matched with someone that has more initial endowment for the game as them. Namely, the player is endowed with 500 CFA (0.74 USD), while their partner is endowed with 1000 CFA (1.48 USD). In the third group, named “advantageous inequality” individuals are matched with someone that has less initial endowment for the game as them. For this group the player is endowed with 1000 CFA (1.48 USD) and the pair is endowed with 500 CFA (0.74 USD).

The cost structure for the game is constant; for each 50 CFA (0.074 USD) the participant spends, they burn 250 CFA of their partner’s endowment. Notice that individuals can only burn in discrete intervals of 250 CFA. This means that individuals can burn: i) 250 CFA of their partner at a cost of 50 CFA, ii) 500 CFA of their partner at a cost of 100 CFA, iii) 750

CFA of their partner at a cost of 150 CFA, and iv) 1000 CFA of their partner at a cost of 200 CFA. Individuals can also opt to not burn; in which case there is no associated cost.

As previously mentioned, individuals were matched anonymously, although it was made salient that they were playing with a real person that had the same nationality as them¹⁷. Moreover, we also made salient the endowment that their partner received.

2.2.3. Measurement

Data collection happened in the first three weeks of October of 2021. Participants of the study were adults, members of the villages that are part of the Senegalese-Guinean Alliance for Peace and Integration. This is an apolitical association that works for dialogue and promotion of economic activities across both sides of the border. The 300 participants were invited to participate using a random walk from a central point of the villages. For each visited household, enumerators would alternate between genders.

Our measurement of antisocial behavior comes from two sources: i) the outcomes of the money burning game described above, and ii) self-reported survey questions.

The first dimension of interest respects the outcome of the game. We employ here two different measures: i) extensive margin, and ii) intensive margin. The extensive margin shows the direct results of the game, namely how much individuals chose to burn. This is a discrete variable that can take the values of 0, 250, 500, 750, and 1000 CFA. The intensive margin also shows the direct results of the game, but it limits the analysis to those that choose

¹⁷ This is particularly important as we want to avoid cross border confounding effects in the outcome of the game.

to burn. This is again a discrete variable that can take the values of 250, 500, 750, and 1000 CFA.

The second dimension of interest respects the expectation of the individuals with regards to the burning behavior of their partners. Therefore, in a post-game survey, we elicited the expectations of the individuals regarding their belief of whether their partners would choose to burn their endowment or not. This is a dummy variable equal to one if the individual believes that their partner would burn them and zero otherwise.

The third dimension of interest respects other three self-reported measures: i) justification of violence, ii) national vs ethnic identification and iii) preferences for inequality. The first measure is an additive index that ranges from 1 to 15 of three questions that inquire the justification of the use of violence. Namely, violence i) in general, ii) for political reasons, and iii) due to grievances.¹⁸ The second measure is a scale between 1 and 5 that inquires national as opposed to ethnic identification¹⁹. The third measure focuses on preferences for inequality, this is also a scale between 1 and 5²⁰.

2.2.4. Additional measurement

¹⁸ Question: For each of the actions described (violence against other people, political violence, and violence due to injustices) please tells us how much violence is justified. Answers: (1-5) where, 1 – never justified and 5 – always justified.

¹⁹ Question: Please tells us with which of the sentences you identify the most. Answers: (1-5) where, 1 – I feel solely [*nationality*] and 5 – I feel solely [*origin group*].

²⁰ Question: For the sentence below please tells how much you agree. Answers : (1-5), 1 – income should be more equal for everybody and 5 – we need more income inequality to foster individual effort.

Employing the above-mentioned survey, we also collected data on the characteristics of the individuals to be able to describe our sample. For example, we collected information on gender, age, household size, civil status, origin group, religion, schooling level, job, occupation, access to different amenities in the village, daily expenses per capita, migration patterns and familial ties with the neighboring country.

To collect additional data on potential mechanisms, we also run two behavioral games. Namely a dictator game to and a trust game. For the dictator, individuals were endowed with 1000 CFA, they were asked how much they wanted to send to the partner. In similar fashion to the money-burning game, individuals were asked to make discrete choices between 0, 250, 500, 750, and 1000 CFA. For the trust game, individuals were again endowed with 1000 CFA. The money that they sent to their partner would be doubled. Individuals were asked to make discrete choices between 0, 250, 500, 750, and 1000 CFA. The partners were anonymous and different for all games. Again, it was made salient to the participants that their partner, even though anonymous, was someone of the same nationality.

2.3. Estimation strategy

Our empirical approach estimates treatment effects on a variety of outcomes related to antisocial behavior and social capital. We now describe the main econometric specifications employed for the estimation.

The effect of interest (β) can be estimated through the equation:

$$y_i = \alpha + \beta_1 Country_i + \beta_2 D_i + \beta_3 A_i + \gamma X_i' + \varepsilon_i \quad (9)$$

where y_i is a outcome of interest, and i is an individual identifier. $Country_i$ is a dummy variable equal to one if the individual lives in Senegal and 0 otherwise. D_i is a dummy variable equal to one if the individual received the disadvantageous inequality treatment and 0 otherwise. A_i is a dummy equal to one if the individual received the disadvantageous inequality treatment and 0 otherwise. X_i' is a vector of demographic characteristics of the individual. The error term ε_i is clustered by session.

In some regressions, we are interested in interaction effects between the country and treatments or between treatments and fundamental social capital characteristics, such as altruism and trust. On those occasions, we estimate a specification of the type that follows. We exemplify with an interaction between the country and treatments.

$$y_i = \alpha + \beta_1 Country_i + \beta_2 D_i + \beta_3 A_i + \beta_4 Country_i * D_i + \beta_5 Country_i * A_i + \gamma X_i' + \varepsilon_i \quad (10)$$

where $Country_i * D_i$ and $Country_i * A_i$ are the interaction terms.

For all specifications, we employ OLS estimations. Additionally, we check whether the main results of the paper are robust to using LASSO procedure to select control variables.

2.4.Hypotheses

First and foremost, we postulate that disadvantageous inequality increases antisocial behavior relative to no inequality or to advantageous inequality. We expect larger effects when considering the difference to advantageous inequality. Second, because of the existing civil conflict in the Casamance region, we expect that the sample from Senegal engages in more antisocial behavior than the Guinea-Bissau sample. Third, we anticipate that the

Senegalese sample reacts more to inequality than the Guinea-Bissau sample (at the level of the interaction effects in specification 2 above), if inequality is a driving force for antisocial behavior and violence, given the differing perceptions about in-country standards of living on both sides of the border we document above.

2.5. Results

2.5.1. Descriptive statistics and balance

Panels A, B, and C of Table B1 in Appendix B of this paper, display mean demographic characteristics in the country and lab-in-the-field experimental control groups. Additionally, they display differences between treatment and control groups. We define treatment groups for the experiment by the type of treatment received in the game (no inequality, disadvantageous inequality, and advantageous inequality). We consider Guinea-Bissau to be our control group in the cross-border comparison. We assess comparability across the different groups by testing their differences' statistical significance to the corresponding control group. A joint F-test for each trait, resulting from a regression on dummy variables for the experimental treatment groups, is also included in the table.

When taking the control group of the lab-in-the-field experiment, individuals on our sample are, on average, 42 years old and live in an eight-person household. Forty-nine percent of this sample is female, and 70% are married or in a union. Sixty-two percent are farmers, and 9% have migrated. Daily per capita expenses are 278 CFA (approximately 42 cents). As expected because of randomization, comparison groups in the lab-in-the-field experiment are generally balanced. Only three differences to control are significant in the 46 differences

tested. These differences are in household size, whether the individual has no schooling, and being an informal vendor. No joint tests are significant.

Turning to the differences between countries in our sample, in Guinea-Bissau, the average individual is 41 years old and lives in a household with eight people. Approximately half of the individuals are female, and 75% are married or in a union. Forty percent have primary schooling, and 13% have attended secondary or upper education. Moreover, 78% of the sample is a farmer. On average, daily expenses per capita are 228 CFA (approximately 0.35 USD). Comparatively, in Senegal, we observe many similar traits. Still, this part of the sample is less likely to be married and has, on average, higher schooling. It is less likely to work on agriculture and more likely to be studying. Migration and family ties to the neighboring country (Guinea-Bissau) are less likely to happen from the Senegalese side. We observe that individuals in Senegal report easier access to medicine.

2.5.2. Main results on antisocial behavior

We start by looking at the direct results of the money-burning game played by the individuals. The distribution of amounts burned can be found in Figure B3 of Appendix B. The results of this game show that approximately 57% of the individuals decided to burn a positive amount of their partner's endowment. Twenty-one percent of the individuals burned the minimum positive amount (250 CFA) and 7% of the individuals burned the maximum positive amount (1000 CFA)²¹. On average individuals across all groups burned 293 CFA.

²¹ It is worth noting that this burning behavior pattern is higher than when compared to results with similar money-burning games played in the laboratory setting (Zizzo and Oswald, 2001)

We now turn to the results of both the lab-in-the-field and cross-border experiment on antisocial behavior. Table 7 shows the results for the amount burned of the individual's counterpart's endowment, namely using the full sample and a restricted sample that conditions the analysis to individuals that burned a positive amount. It also shows the results from the expectations of being burned by their counterpart formed during the money-burning game. Specifications (1), (3), and (5) employ equation 1 as described in the previous section. Specifications (2), (4), and (6) employ equation 2 as described above. All regressions include individual controls: gender, age, household size, civil status, origin group, religion, schooling, job, access to medicine, daily expenses per capita, migration, and having family in the neighboring country.

We now move towards analyzing the results of the lab-in-the-field. Regarding the advantageous inequality treatment group, the results are robust across all specifications. Looking first at the full sample, we see that in the advantageous treatment group individuals burn less 113-171 CFA, on average, than individuals in the no inequality group. These results are significant at the 10% level and the 1% level. Conditioning our sample to individuals that burned a positive amount, we see that, on average, participants burned less 127-235 CFA than the no inequality group. These results are significant at 5-10% levels. The sign on the expectation of being burned variable is positive and significant for specification 6. The advantageous inequality treatment increases on average expectation of being burned by 12.6 percentage points. This follows what was to be expected; individuals in a more advantageous position expected to be burned more. Looking now at the disadvantageous inequality treatment, we see that we have mostly a negative coefficient on the outcomes of the money-

burning game. However, these results are not significant at any standard significance level. Additionally, although not significant as well, we see a negative sign regarding the expectation of being burned by their counterparts. This negative sign is in the direction to be expected; individuals in a disadvantageous position expect to be burned less.

Additionally, we find clear effects of inequality on increasing antisocial behavior in the money-burning game. Specifically, we find a statistically significant effect, at the 1-5% significant level of the difference between the advantageous and disadvantageous inequality treatment groups on decreasing antisocial behavior. Namely, the amount burned increases from 84 CFA in the advantageous inequality group to 259 CFA in the disadvantageous inequality group employing the full sample. When we restrict our sample to individuals that burned a positive amount, the amount burned increases from 239 CFA to 417 CFA when changing inequality from advantageous to disadvantageous. This difference is significant at the 1% level. This result is robust across all specifications except 4. This difference is statistically significant also for the expectation outcome. The expectation of being burned increases by approximately 15 percentage points when changing inequality from the advantageous inequality to the disadvantageous inequality treatment.

We now turn to the analysis of the coefficients for the cross-border experiment. Using the full sample, we see that individuals in the treatment group burn approximately 105 CFA more than individuals in the control group. These results are, however, not significant at any standard significance level. When conditioning the sample to individuals that burned a positive amount, we see that, on average, individuals in Senegal behave in a more antisocial manner when compared to those in Guinea-Bissau. Specifically, individuals in the cross-

border experiment treatment group burn approximately 259-307 CFA more than individuals in the control group. These results are statistically significant at 1 percent level in both specifications. With regards to the expectation of whether individuals believed that their counterparts would burn them or not, we can see that there are no significant differences between individuals playing on the two sides of the border. This suggests that the results found are not driven by different expectations of burning across the border.

We now turn our attention to specifications two and four that include the interaction terms between the cross-border and lab-in-the-field experiments. The interaction term of the country variable with the advantageous inequality treatment is negative, with magnitude 207 CFA, and statistically significant at 5% level for the sample of individuals that burned a positive amount. We cannot find any specific pattern, on the outcomes of the money-burning game, when interacting the country variable with the disadvantageous inequality treatment. Concerning the expectations outcome, in specification 6, the coefficients are negative, although not significant.

Moreover, we find that individuals in the Senegalese side of the border are more responsive to inequality than those in the Guinea-Bissau side. Specifically, the difference between advantageous and disadvantageous inequality increases more antisocial behavior in Senegal than in Guinea-Bissau. Looking at the full sample, in Senegal moving from the advantageous to the disadvantageous inequality treatment reduces burning by 303 CFA, while in Guinea-Bissau this value is 72 CFA. Conditioning our sample to individuals that burned a positive amount, the difference between advantageous and disadvantageous inequality in Senegal

reduces the amount burned by 266 CFA and in Guinea-Bissau 73 CFA. These differences are significant between 1-5 percent level of significance.

Table 7 - Antisocial behavior

Dependent variable -->	Amount burned (CFA)		Amount burned - positive (CFA)		Expectation of being burned	
	(1)	(2)	(3)	(4)	(5)	(6)
Advantageous inequality (a)	-170.679*** (52.523)	-112.542* (59.431)	-234.687*** (52.34)	-127.014** (63.11)	0.077 (0.072)	0.126* (0.068)
Disadvantageous inequality (b)	3.771 (51.778)	-40.411 (60.44)	-56.153 (53.059)	-54.157 (85.831)	-0.082 (0.067)	-0.025 (0.076)
Senegal	104.89 (134.484)	105.822 (148.278)	258.735*** (93.93)	306.691*** (96.151)	0.103 (0.134)	0.166 (0.157)
Senegal*Adv inequality (c)		-132.562 (110.688)		-207.468** (99.189)		-0.11 (0.156)
Senegal*Dis inequality (d)		97.808 (104.224)		-14.682 (114.604)		-0.13 (0.133)
H0: (a)-(b)=0 F-stat p-value	0.000	0.032	0.001	0.264	0.009	0.011
H0: (c)-(d)=0 F-stat p-value		0.000		0.025		0.849
Individual controls	yes	yes	yes	yes	yes	yes
Mean dependent variable	254.808	254.808	473.214	473.214	0.400	0.400
R-squared adjusted	0.225	0.241	0.23	0.252	0.088	0.084
Number of observations	288	288	168	168	283	283

Note: OLS regressions. Dependent variable in columns (1)-(2) is discrete, it takes the values of 0, 250, 500, 750, and 1000 CFA. Dependent variable in columns (3)-(4) is discrete, it takes the values of 250, 500, 750, and 1000 CFA. Dependent variable in columns (5)- (6) is a dummy variable equal to 1 if the individual expected to be burned by their partner and 0 otherwise. Disadvantageous inequality is a dummy variable equal to 1 if the individual received the disadvantageous inequality treatment and 0 otherwise. Advantageous inequality is a dummy variable equal to 1 if the individual received the advantageous inequality treatment and 0 otherwise. Senegal is a dummy variable equal to 1 if the participant is from Senegal and 0 if they are from Guinea-Bissau. Senegal*Dis inequality is the interaction term between Senegal and the treatment disadvantageous inequality. Senegal*Adv inequality is the interaction term between Senegal and advantageous inequality. Standard errors are clustered by session. All regressions have location and individual controls. Individual controls are: gender, age, household size, civil status, origin group, religion, schooling, job, access to medicine, daily expenses per capita, migration and having family in the neighboring country. * significant at 10%; ** significant at 5%; *** significant at 1%

Table B2 in the Appendix B shows the same specifications using a LASSO regression, notice that the results presented there show very little difference to the ones discussed now.

Specifications (2), (4), and (6) employ equation 2 as described above. All regressions include individual controls: gender, age, household size, civil status, origin group, religion, schooling, job, access to medicine, daily expenses per capita, migration, and having family in the neighboring country.

2.5.3. Additional results on survey outcomes

Next, we turn our attention to the results on the survey outcomes. Table 8 shows the results of three self-reported survey measures. Columns (1)-(2) show the results of the violence justified outcome. Columns (3)-(4) show the results of the national vs ethnic identification outcome. And columns (5)-(6) show the results for the preferences for inequality result. Specifications (1), (3), and (5) employ equation 1 as described in the previous section.

Looking first at the experimental treatments, we find that both types of inequality introduced within the game reduce the justification of violence. Disadvantageous inequality decreases, on average, violence justification by 0.5-0.8 points; this result is significant in all specifications between 1-10% levels. The advantageous inequality treatment reduces violence justification by 0.5-0.7 points. Only in specification (1) is this result significant, namely at the 1% level. It is relevant to recall that violence justified is being measured on a scale of maximum 15 points (that represents that all injustices can be justified by violence), where the mean dependent variable is already between 9.3-9.4 points. This points at a high tolerance for violence. Looking now at the cross-border experiment we see that the justification of violence is higher by 2.6-2.9 points, on average, on the Senegalese side of the border. This result is significant in all specifications at the 1% level. With regards to the interaction effects, we find the coefficient to be negative, although this result is not significant

at any standard significance levels. Moreover, we find no significant differences, in the F-test for equality, between both the experimental treatments and the interaction terms.

Table 8 - Survey outcomes

Dependent variable -->	Violence justified		Ethnic vs National identification		Preferences for inequality	
	(1)	(2)	(3)	(4)	(5)	(6)
Advantageous inequality (a)	-0.713*** (0.248)	-0.568 (0.346)	0.081 (0.120)	0.224** (0.101)	0.065 (0.203)	0.102 (0.318)
Disadvantageous inequality (b)	-0.839*** (0.224)	-0.519* (0.299)	0.001 (0.119)	0.021 (0.131)	0.225 (0.225)	0.274 (0.307)
Senegal	2.590*** (0.878)	2.857*** (0.954)	1.080* (0.572)	1.161** (0.545)	-0.237 (0.411)	-0.189 (0.462)
Senegal*Adv inequality (c)		-0.722 (0.503)		-0.048 (0.213)		-0.11 (0.397)
Senegal*Dis inequality (d)		-0.32 (0.435)		-0.321 (0.218)		-0.082 (0.417)
H0: (a)-(b)=0 F-stat p-value	0.637	0.885	0.522	0.062	0.419	0.568
H0: (c)-(d)=0 F-stat p-value		0.418		0.239		0.94
Individual controls	yes	yes	yes	yes	yes	yes
Mean dependent variable	9.404	9.404	2.885	2.885	3.135	3.135
R-squared adjusted	0.466	0.464	0.05	0.047	0.085	0.078
Number of observations	288	288	288	288	287	287

Note: OLS regressions. Dependent variable in columns (1)-(3) is a scale from 1-15 of violence justification (1 – violence is never justified, 15 – violence is always justified). Dependent variable in columns (4)-(6) is a scale from 1-5 of national vs ethnic identification (1 – national identification only, 5 ethnic identification only). Dependent variable in columns (7)-(9) is a scale of 1-5 of preferences for redistribution (1 – Income should be more equal for everybody, 5 – we need more income inequality to foster individual effort). Senegal is a dummy variable equal to 1 if the participant is from Senegal and 0 if they are from Guinea-Bissau. Disadvantageous inequality is a dummy variable equal to 1 if the individual is in the Disadvantageous inequality treatment and 0 otherwise. Advantageous inequality is a dummy variable equal to 1 if the individual is in the Advantageous inequality treatment and 0 otherwise. Senegal is a dummy variable equal to 1 if the participant is from Senegal and 0 if they are from Guinea-Bissau. Disadvantageous inequality is a dummy variable equal to 1 if the individual received the disadvantageous inequality treatment and 0 otherwise. Advantageous inequality is a dummy variable equal to 1 if the individual received the advantageous inequality treatment and 0 otherwise. Senegal*Dis inequality is the interaction term between Senegal and the treatment disadvantageous inequality. Senegal*Adv inequality is the interaction term between Senegal and advantageous inequality. Standard errors are clustered by session. All regressions have location and individual controls. Individual controls are: gender, age, household size, civil status, origin group, religion, schooling, job, access to medicine, daily expenses per capita, migration and having family in the neighboring country. * significant at 10%; ** significant at 5%; *** significant at 1%

Regarding specifications (3)-(4) national vs ethnic identification, we can see that the mean dependent variable is approximately 2.9, on a scale from 1 to 5. This means that individuals identify equally between being of their nationality and their group of origin. Looking first at the results of the experimental treatments, we find that the coefficients are all positive with magnitudes between 0-0.2. Particularly we see that the advantageous inequality treatment increases on average ethnical identification by 0.2 points on the scale, this result is significant at the 5% level²². Looking now at the results of the cross-border experiment, we can see that ethnic identification is higher by 1-1.2 points, on average, on individuals on the Senegalese side of the border, i.e. a lower national identification than the ones on the Guinean-Bissau side of the border. This result is significant at the 5-10% level.

Looking at specifications five and six, we see that there are no significant results of the effects of the inequality and cross-border experiments on the preferences for inequality. With regards to the effects of the two inequality treatments on preferences for inequality, we see a positive sign on all coefficients with magnitudes between 0.1-0.3. We find consistently a negative sign for individuals in the Senegalese side of the border (approximately of magnitude 0.2).

2.5.4. Mechanisms

We now turn our attention to the results of the dictator and trust games. These results can be found in Figure A3 of the Appendix A. The results of the dictator game show that most individuals chose to send 500 or 250 CFA; i.e. the mean and right below the mean split.

²² Notice that the significance of this result does not hold in the LASSO regressions shown in Table B3 of Appendix B.

Additionally, on average, individuals gave approximately 412 CFA, which corresponds to 41% of the total endowment. A meta-analysis conducted by Engel (2011), shows that on average dictators give 28.4% of the total endowment, indicating that the individuals in the study demonstrate higher level of altruism than the ones exhibited on average. The results of the trust game show again that most individuals chose to send 500 or 250 CFA; i.e. the mean and right below the mean split. On average, individuals send approximately 436 CFA, meaning 44% of the total endowment. This value is slightly below the one observed in the meta-analysis conducted in Johnson and Mislin (2011), where on average individuals send 50% of their endowment. This is however in line with the observation that subjects send less in trust games conducted in the African continent (Johnson and Mislin, 2011).

We now look at the results of burning and expectations of the money-burning game through an altruism and trust lenses. Table 9 show the results of the outcomes from the money-burning game and the results from the expectations formed in the same game. All specifications employ equation 2 as previously described. All regressions include individual controls: gender, age, household size, civil status, origin group, religion, schooling, job, access to medicine, daily expenses per capita, migration, and having family in the neighboring country. We are particularly interested in the interaction terms between the experimental groups and the altruism and trust measures of an individual.

With regards to altruism, we seem to find no discernable pattern, employing both the full sample and the restricted sample that burned a positive amount. This seems to suggest the results observed in the money burning game are not being affected by altruism. Looking now at the results of the expectation of being burned, we see that more altruistic individuals that

are the disadvantageous inequality group expect to be burned more (magnitude 0.28). This result is significant at ten percent level.

Table 9 - Heterogenous effects

Dependent variable -->	Amount burned (CFA)		Amount burned – positive (CFA)		Expectation of being burned	
	(1)	(2)	(3)	(4)	(5)	(6)
Advantageous inequality * Altruism	82.585		-10.881		0.123	
	(60.229)		(82.791)		(0.154)	
Disadvantageous inequality * Altruism	-35.729		24.071		0.280*	
	(83.578)		(96.426)		(0.169)	
Advantageous inequality * Trust		-29.04		25.737		0.011
		(70.933)		(87.973)		(0.119)
Disadvantageous inequality * Trust		-241.040***		-36.942		0.196
		(-81.119)		(121.083)		(0.152)
Altruism	29.853		51.733		-0.194*	
	(46.593)		(57.627)		(0.102)	
Trust		116.322**		57.192		-0.129
		(52.567)		(65.105)		(0.093)
Advantageous inequality	-218.320***	-159.195**	-232.766***	-258.683***	0.021	0.077
	(52.899)	(75.678)	(52.646)	(78.714)	(0.093)	(0.095)
Disadvantageous inequality	23.15	148.942*	-70.151	-32.518	-0.228**	-0.197*
	(54.829)	(77.855)	(69.505)	(95.216)	(0.099)	(0.105)
Individual controls	yes	yes	yes	yes	yes	yes
Constant	211.78	187.898	441.367***	433.689**	0.288	0.22
	-186.88	-192.335	-166.757	-171.068	-0.307	-0.313
R-squared adjusted	0.227	0.244	0.227	0.224	0.093	0.088
Number of observations	288	288	168	168	283	283

Note: OLS regressions. Dependent variable in columns (1) and (2) is discrete, it takes the values of 0, 250, 500, 750, and 1000 CFA. Dependent variable in columns (3) and (4) is discrete, it takes the values of 250, 500, 750, and 1000 CFA. Dependent variable in columns (4) and (5) is a dummy variable equal to 1 if the individual expected to be burned by their partner and 0 otherwise. Disadvantageous inequality is a dummy variable equal to 1 if the individual received the disadvantageous inequality treatment and 0 otherwise. Advantageous inequality is a dummy variable equal to 1 if the individual received the advantageous inequality treatment and 0 otherwise. Altruism and Trust are dummy variables equal to 1 if the individual sent at least half of their endowment and 0 otherwise in the dictator and trust game, respectively. Standard errors are clustered by session. All regressions have location and individual controls. Individual controls are: gender, age, household size, civil status, origin group, religion, schooling, job, access to medicine, daily expenses per capita, migration and having family in the neighboring country. * significant at 10%; ** significant at 5%; *** significant at 1%

With what respects trust, we can see a more discernable pattern emerging. More trusting individuals in an inequality treatment group seem to burn less. This result is significant at

one percent employing all individuals in the sample, with a coefficient of 241 CFA. This seems to hint that trust might be playing a role in the way that individuals make their burning decisions. Namely, trust might play a mediating role in the display of antisocial behavior. Now turning to column 6, to the expectation of being burned, we observe that both interaction terms exhibit a positive coefficient, even though none of them are significant.

2.6. Concluding remarks

In this work, we find that inequality matters for antisocial behavior: specifically, the difference between disadvantageous and advantageous inequality increases money burning. This effect of inequality is stronger in the Senegalese side of the border, which hints at the importance of inequality in driving actual conflict.

Goal 10 of the Sustainable Development Goals (SDGs) is to reduce inequalities within and between countries. Among the already many reasons that have led to the definition of this goal, the potential consequences of inequality unveiled in this work, make it imperative for this objective to be achieved by 2030.

The pandemic has proven to deter development in this area, by deepening inequalities, hitting poor and vulnerable communities the hardest. This puts additional pressure on governments and organizations to develop effective solutions to dampen inequalities amongst individuals. Particularly important to do so, is to disentangle clear mechanisms through which inequality impacts antisocial behavior, and to avenues through which this impact can be reduced.

In our paper, we are able to look at antisocial behavior through the mediating lenses of altruism and trust. Altruism does not seem to interact with inequality. However, we do see

that increased trust is a potential mitigator of antisocial behavior even when individuals are in a position of disadvantageous inequality.

Chapter 3

Information, get-out-the-vote messages, and peer influence:

Causal effects on political behavior in Mozambique²³

3.1. Introduction

Political accountability around elections is a cornerstone of democratic systems (see Bentham, [1816] 1999). The ideal of accountability can however be impeded by limited information about political options in the hands of voters and by low levels of citizen mobilization. Citizen information and mobilization may be particularly difficult in Sub-Saharan African countries. In this region, democratic elections are often tainted with phenomena that embody lack of policy accountability, like clientelism (Wantchekon, 2003) or vote-buying (Vicente, 2014), and are frequently taken as the focal point for intimidation or violence (Collier and Vicente, 2014), which are likely to de-mobilize voters for political participation.

Information and get-out-the-vote (GOTV) campaigns around elections have the potential to pave the way for the ideal of democratic accountability. The recent experimental literature in Sub-Saharan countries, although diverse, has often shown changes in that direction

²³ This chapter has been published in the Journal of Development Economics with reference Grácio, Matilde and Pedro C. Vicente. 2021. "Information, get-out-the-vote messages, and peer influence: Causal effects on political behavior in Mozambique." Journal of Development Economics 151: 102665.

(Wantchekon, 2003; Humphreys and Weinstein, 2012; Fujiwara and Wantchekon, 2013; Vicente, 2014; Collier and Vicente, 2014; Aker et al., 2017; Marx et al., 2017; Grossman and Michelitch, 2018).²⁴ Newspapers and text messages are prominent means of political communication that have been tested experimentally in a range of settings (see Gerber et al., 2009, and Dale and Strauss, 2009, for U.S. elections). We need to consolidate our knowledge about how they can be adapted for information and GOTV campaigns in developing countries. Still, our understanding of how individuals' political behavior can be changed by their peers and how this influence can interact with broader information has the potential to be as important. It is likely that specific demographic traits of influencers help, and we know little about the potential for free-riding once citizens know that others are acting on the common information they receive. The study of these questions is typically constrained by the difficulties posed by the endogeneity of one's peers and their messages.

In this paper, we report on the results of a field experiment conducted during the municipal elections of 2013 in Mozambique. We analyze the impact of an information campaign through the distribution of a free newspaper and of GOTV through text messaging on political behavior. Both types of interventions were new to the setting and happened in the

²⁴ Note however that we do not claim in this paper the full relation of information and GOTV with the end goal of political accountability. In fact, having informed and mobilized voters is not likely to be a sufficient condition for accountability: in a recent meta-analysis of coordinated experiments in a range of developing countries, Dunning et al. (2019) did find some effects but not a systematic link between information campaigns and increased political accountability.

run up to the elections. We collaborated with a high-circulation and independent newspaper, which operates a hotline. The distribution of the newspaper was set at the level of the polling location. We also had a control group of locations, with no distribution of newspapers. The GOTV treatments were set at the level of the individual and included three types of messages: simple reminders about the election, reminders about the election coming from peers, and encouragements to vote coming from peers. We also had a control group that received no messages.

To guarantee exogeneity of peer influence through the SMS reminders and encouragements, our experimental subjects were randomly assigned peers from the same pool of experimental subjects. These links were not pre-existing. Specifically, we assigned each experimental subject a group of similar and a group of dissimilar peers, in terms of gender and age. These characteristics were primed in the messages that were sent. In this way, we can study the causal impact of messages coming from peers and isolate the effect of specific peer characteristics. We are also able to test the impact of peer influence in a context where a location-wide information campaign is going on and is common knowledge.

This project happened nationwide in Mozambique. Subject recruitment followed a random process. First, we randomly selected 20 municipalities – Mozambique has 53 municipalities. We drew 191 polling locations from the municipalities in our study. Experimental subjects were selected from these polling locations using standard techniques at the time of our baseline survey. We employ a range of measurements of political behavior. First, we analyze the official electoral results of the 2013 local elections at the level of the polling location. These include voter turnout and voting for the candidates. Second, we use behavioral

measures relating to the sending of SMSs at the individual level. Experimental subjects were invited to send messages reporting electoral problems for a hotline before and during the election day. They were also invited to send text messages with their policy priorities (an open letter) to the newly elected mayors after the elections. The newspaper also invited its readers to send information and convey opinions during the electoral period. Third, we devote attention to voter turnout. We compose several measures of voter turnout based on information gathered during our post-election survey: self-reports, the interviewer assessment about whether the respondent voted (after he/she submitted a module of survey questions on the election day and ballot station facts), and whether the respondent voted in a replication of the voting procedure using survey ballot boxes. Finally, we measured voting for the candidates/parties using the replication of the voting procedure during the post-election survey.

The results of this experiment follow closely a pre-analysis plan that we published before submitting the full treatments. We find a clear positive effect of newspaper distribution on voter turnout while employing official electoral data at the level of the polling location: participation at the polls increased by 3–6 percentage points. We also observe that the text messages increased, on average, the sending of SMS relating to the elections by experimental subjects and the turnout of voters as given by our measures. Specifically, the turnout effect is between 7 and 8 percentage points. Turning to peer influence, we identify causal increase on political participation when analyzing the influence of male subjects on their peers. In addition, older peers influence experimental subjects to vote for the ruling party. Finally, we find evidence in favor of stronger effects of the peer messages on the political participation

of subjects that had the newspaper distributed in their locations, which is not consistent with subjects free-riding on others. An important body of research relating to elections in the U.S. has suggested that engaging in politics is sensitive to information and contact. Gerber et al. (2009) show that access to newspapers, in the run up to an election in the U.S., can alter voting behavior. Gerber and Green (2000) show the importance of face-to-face political mobilization for voter turnout in the context of GOTV campaigns.²⁵ Gerber et al. (2008) test different types of incentives to vote and find that social pressure produces large effects. In line with these results, Nickerson (2008) find substantial contagion of GOTV campaigning between household members. Dale and Strauss (2009) are the first to report turnout effects from text messaging. The literature on information and GOTV campaigns in the context of elections in developing countries can be divided in two streams. First, the literature related to the communication of politicians' proposals and performance, using experiments (Wantchekon, 2003; Banerjee et al., 2011; Humphreys and Weinstein, 2012; Fujiwara and Wantchekon, 2013; Chong et al., 2015; Cruz et al., 2020; Grossman and Michelitch, 2018; Dunning et al., 2019) or other natural settings (Ferraz and Finan, 2008; Casey, 2015). Note that this literature is not always positive regarding the link between information and political accountability. Second, the literature on conveying civic information related to electoral practices and on improving electoral procedures, not directly related to policy-accountability (Vicente, 2014; Collier and Vicente, 2014; Fujiwara, 2015; Aker et al., 2017; León, 2017; Marx et al., 2017). Note that we are particularly interested in the use of text messages as

²⁵ Pons (2018) reports on substantial and long-lasting electoral impacts of door-to-door canvassing during presidential elections in France.

means of communication to mobilize voters like in Aker et al. (2017) and Marx et al. (2017). In terms of relevant outcomes of analysis, we relate most closely to contributions employing behavioral measures of political participation like the costly sending of postcards (Batista and Vicente, 2011; Collier and Vicente, 2014) and the costly sending of SMS (Aker et al., 2017; Grossman et al., 2014). Other studies explore network effects of randomized voter education in developing countries.²⁶ Fafchamps and Vicente (2013) observe social network effects on voter perceptions in the context of campaigning against political violence in Nigeria. Gine and Mansuri (2018) find large turnout externalities of a voter awareness campaign directed at women in Pakistan, by exploring different intensities of treatment per geographical unit.²⁷ Our study builds specifically on the analysis of network effects in a previous experiment run during the 2009 elections in Mozambique (Fafchamps et al., 2020). While voter education channeling information about the election increased voter turnout in the referred study, effects are weaker for more central groups in the local social networks. It is possible that more central individuals free-ride on others' electoral participation using their better knowledge of the interventions and corresponding (direct) impact on voting. However, the causality of the (endogenous) network variables employed in Fafchamps et al. (2020) is difficult to establish. Our paper attempts to advance on this issue by identifying the causal

²⁶ Differently, Finkel and Smith (2011) employ panel regressions to assess the impact of nationwide voter education in Kenya. They find peer effects on democratic knowledge and values.

²⁷ Although the causal effect of different intensities of GOTV campaigning can be interpreted as related to the causal effect of explicit peer-to-peer communication and mobilization to vote (which is what we analyze in this paper), it is difficult to be sure that there are no other possible interpretations for the former. For instance, the effect of different intensities of campaigning in terms of content reach is difficult to distinguish from the effect of simple perceptions about campaigner presence in a geographical unit.

impact of peer influence (not centrality) in face of location-level efforts towards voter mobilization. Centola (2011) employs a similar structure while studying homophily,²⁸ in the context of the adoption of healthy behaviors.²⁹

The paper is organized as follows. In section 2 we present the context of our field experiment. In section 3 we fully develop the experimental design, with treatments, sampling and assignment to treatment, model and hypotheses, measurement, as well as estimation strategy. The following section provides the econometric results, including treatment effects of the newspaper treatment, the SMS treatments, in addition to the analysis of peer influence and its interaction with the location-level distribution of the newspaper. We conclude in section 5.

3.2.Context

Mozambique became independent in 1975, after which FRELIMO (Frente de Libertação de Moçambique), the independence movement, led a single-party, socialist regime. Beginning in 1977, Mozambique suffered a devastating civil war, fought between FRELIMO and RENAMO (Resistência Nacional Moçambicana). The civil war ended in 1992 with an agreement to hold multi-party elections. FRELIMO and its sponsored presidential candidates

²⁸ Homophily is defined by individuals being particularly responsive to pressures from similar peers. See McPherson et al. (2001) for a broad introduction to the concept.

²⁹ Recent contributions to the literature on social networks and electoral politics include the work of Fafchamps and Labonne (2020), who report that central households are more likely to receive public services in the Philippines, in line with the idea that these households are best for exerting social pressure and securing electoral support. Arias et al. (2019) analyze a field experiment disseminating information in Mexico and combine it with detailed family network data: they suggest that networks can help voters coordinate around information to help remove poorly performing politicians.

won all national elections since 1994, with RENAMO as the main contender. More importantly, FRELIMO consistently increased its vote share, while voter turnout has decreased considerably. The lowest turnout rate was recorded in 2004, with just 36 percent. In 2009, MDM (Movimento Democrático Moçambicano) was launched by the then mayor of Beira, Daviz Simango and became the clear third party, popular among the urban electorate.

At the local level, municipal elections were held in 1998, 2003, 2008, and 2013. These elections comprise an election for the president of the municipality and one election for the municipal assembly. Mozambican municipalities correspond to the largest cities of the country, as well as to selected smaller towns. The municipal elections of November 20, 2013, constitute the focal point of this study. The 2013 elections happened in a particularly sensitive period for the politics of the country. They happened just before the FRELIMO candidate to the 2014 presidential elections was selected (as Armando Guebuza, the then president, was unable to run for reelection due to a term limit). Given the overwhelming degree of control of the ruling party over the country, there was little doubt that FRELIMO's candidate would win the following presidential elections. There was a clear understanding that the results of the municipal election would define relative power within FRELIMO. Hence, electoral participation in these elections was particularly important.

At the same time, RENAMO and its leader Afonso Dhlakama had become discredited with voters, reaching an all-time low score of 16 percent in the 2009 presidential election. Dhlakama was widely seen as outdated, often referring to the possibility of taking up arms. In the run up to the 2013 municipal elections, Dhlakama increased the tone in favor of a

reform of the electoral law and announced RENAMO's boycott to the municipal elections. Contemporaneously, armed supporters of RENAMO initiated violent episodes. This conflict reached a peak in October of 2013, just a few weeks before the municipal elections, when RENAMO announced the end of the 1992 peace accord and attacks to civilians were undertaken in Sofala province, resulting in dozens of deaths. Negotiations between the government and RENAMO were held but had no visible implications before the elections. Despite the conflict situation in central Mozambique, the municipal elections were held in all municipalities.³⁰ Overall turnout rate was 46 percent. The fact that MDM had clear urban support, and that RENAMO did not run in these elections, was an opportunity for MDM, which won in four municipalities and had sizable vote shares in many others.

On the state of politics in Mozambique, Freedom House has been considering the country to be 'partly-free', and the World Bank Governance Indicators have set the country on a decreasing trend in terms of voice and accountability as well as government effectiveness. Pereira et al. (2002, 2003), based on Afrobarometer data, find relatively low levels of support for democracy and characterize Mozambique as a 'democracy with problems.' In the same sequence of work, Mattes and Shenga (2007) hypothesize that the very low levels of political accountability observed in Mozambique may be the result of deficient channels of information dissemination, exacerbated by poverty and low education. Indeed, looking at Afrobarometer data from 2002 to 2012, we observe that the proportion of respondents with

³⁰ Note that the 2013 municipal elections were generally evaluated as free and fair. This is despite several instances of irregularities and the fact that the elections in two municipalities (Gurué and Nampula) had to be repeated shortly after November 20. We should also mention the occurrence of some violence related to electoral campaigning in the two weeks before the election.

no interest in public affairs increased steadily over time, accompanied by a decreasing trend on accessing news information through the most important media (radio). We also note that more than 70 percent of respondents never had access to news through newspapers in 2012. The levels of electoral participation in Mozambique are correlated with this picture. De Brito (2007) underscores the marked decreasing trend of voter turnout, distinctive by regional standards.

3.3. Experimental design

3.3.1. Treatments

We collaborated with newspaper @Verdade (<http://www.verdade.co.mz/>).³¹ This is a free newspaper created in 2008. It is a general-interest, privately owned newspaper run by social entrepreneurs, with a clear civic education mandate. Its distribution has mainly been in the Maputo city area. The interventions we study in this paper were designed and conducted with the active collaboration of newspaper @Verdade: it sees the dissemination of information and the encouragement of voter participation as central to its mission. We now turn to the description of each specific intervention, divided into distribution of the newspaper and SMS interventions.

The first set of interventions we study regards the distribution of weekly newspaper @Verdade in municipalities that had never had systematic distribution of that newspaper,

³¹ Observatório Eleitoral, an organization blending the specific efforts of eight member Mozambican NGOs in the area of good electoral conduct and electoral observation, IREX, an international NGO devoted to media strengthening, and Parlamento Juvenil, a Mozambican movement focusing on youth rights, also supported this research project.

which we label @Verdade municipalities. This distribution happened during the two/three weeks before the electoral campaign of the municipal elections of November 2013. The distribution was set at the level of the polling location, i.e., door-to-door around polling locations (it approximated a random procedure as fieldworkers followed a pre-set interval between houses). The first round of distribution was performed either by enumerators in the context of our baseline survey, or by a group of fieldworkers associated with @Verdade. In each of these locations, around 100 newspapers were distributed in each week until the elections. We also had a control set of polling locations.³²

The second set of interventions we study concerns text messages received on mobile phones. The pool of experimental subjects that received SMSs agreed to receiving SMSs relating to the elections during our baseline survey.³³ These SMSs reminded voters about the municipal elections of November 2013. Some of them also encouraged voters to participate in the election. The receiving of text messages happened during the week before the elections and varied across two dimensions.

Our first dimension of interest was the strength of the message. We varied the contents of the messages, going from simple and neutral reminders about the election to personal

³² Note that, given the conflict situation in central Mozambique in the weeks leading to the November elections, the newspaper shared the covering of the municipal elections with other important topics, namely those related to the conflict with RENAMO. See the following video, for some images of newspaper distribution in this project: <http://vimeo.com/85717778>.

³³ Only 6 percent opted out of receiving SMSs during the baseline survey.

encouragements to vote.³⁴ Specifically, we had a simple reminder message about the election ('REMEMBER: Municipal elections are on November 20.'), which we label placebo message, and we had messages labeled as coming from specific individuals. Each experimental subject was allocated other experimental subjects. The subjects in these groups agreed to share their information about electoral participation through SMSs. We sent messages on their behalf as reminders ('My name is XXX [first name, gender implied], I am a participant [gender] in the study on Mozambican politics, I am on my XXXs [age group], and I would like to remind you that the municipal elections are on November 20.') or encouragements ('My name is XXX [first name, gender implied], I am a participant [gender] in the study on Mozambican politics, I am on my XXXs [age group], AND I WILL VOTE ON THE NEXT MUNICIPAL ELECTIONS ON NOVEMBER 20. I WOULD LIKE YOU TO VOTE AS WELL!'). We label the peer reminders as neutral messages and the peer encouragements as positive messages. Note that these messages included clear gender (stemming from the name of the subject and the Portuguese language gender reference in the word 'participant') and age anchors.³⁵ In addition to these three groups, we also had a control group of experimental subjects that had no messages sent to them.

³⁴ We note that there is a clear positive correlation in the Afrobarometer data for Mozambique, as well as in our own dataset, between turning out to vote and measures of social capital at the individual level. We take this evidence as consistent with the importance of personal interaction for voting.

³⁵ The original Portuguese versions of the three types of messages are the following. Reminder: 'LEMBRE-SE: As eleicoes municipais sao no dia 20 de Novembro.' Peer reminder: 'O meu nome e XXX, sou XXX [um(a)] participante no estudo sobre politica Mocambicana, tenho idade nos XXXs, e gostaria de lembrar que as eleicoes municipais sao no dia 20 de Novembro.' Peer encouragement: 'O meu nome e XXX, sou XXX [um(a)] participante no estudo sobre politica Mocambicana, tenho idade nos XXXs, E VOU VOTAR NAS PROXIMAS ELEICOES MUNICIPAIS NO DIA 20 DE NOVEMBRO. GOSTAVA QUE VOTASSE TAMBEM!'

Our second dimension of interest was peer similarity. We varied the type of individuals assigned to each experimental subject. Specifically, we had each experimental subject assigned both a similar group of peers and a dissimilar one. The similar group of peers was composed by two other experimental subjects, with the same gender and the same age group, e.g., subjects in the bottom half of the age distribution were paired with subjects in the bottom half. The dissimilar group of peers was composed by two other experimental subjects, with the opposite gender and the opposite age group. Within each group of peers, we divided messages across the four types of contents that we described above: control, placebo, neutral, and positive. The treatment assignment is summarized in Table C1 in the Appendix to this paper, as a $3 \times 3 + 1$ design. Note that to maximize statistical power, we opted not to have the interaction of control messages corresponding to similar (dissimilar) groups of peers and other types of contents corresponding to dissimilar (similar) groups of peers. During each of the six days before the elections and the election day (starting on November 14 and ending on November 20), each SMS treatment group was sent four messages, two from the similar group of peers and two from the dissimilar group of peers. For both the peer reminders and the encouragements, the messages were labeled as originating from specific peers (one message per peer). On November 13, each SMS treatment group also received a set of three introductory messages.³⁶ These SMS treatments were submitted through an online platform,

³⁶ Reminder subjects received a contextual message three times ('You were interviewed for a study on Mozambican politics in the last 3 weeks. As mentioned then, we would like to send you messages relating to the elections of November 20.'). Subjects receiving neutral (peer reminder) or positive (peer encouragement) messages also received the message just described. However, they received it just once, and received two other messages containing background information to the peer treatments, divided into procedure ('You were grouped with XXX [2 or 4] other people that we interviewed for our study. XXX ['These people are similar to you.' Or

allowing the sending of bulk messages, designed on purpose for this experiment. It was linked to a shortcode that the newspaper @Verdade uses for receiving SMSs from readers. In that sense, experimental subjects could have associated the messages to @Verdade.

3.3.2. Sampling and assignment to treatment

The sampling frame of our experiment was constructed from the voter registration map of the 2013 municipal elections, made available by the electoral administration arm of the National Electoral Commission (STAE). Mobile phone coverage is available in all municipalities of the country, so that was not a restriction when selecting our experimental locations.³⁷

We first asked the newspaper to select out the municipalities where distribution was not possible (some of the municipalities were too remote for the distribution channels of the newspaper). That procedure led us to 44 municipalities, from the total 53. Twenty-two municipalities were selected from within the 44 municipalities through a block randomization procedure by which pairs of municipalities were formed (based on geographical proximity and the results of the 2009 national elections) and randomization was

nothing] These individuals will share with you XXX [‘information about’ or ‘whether they intend to vote in’] the municipal elections of November 20.’) and purpose (‘The objective of the messages sent by your group is to give you information about whether those people will vote, which may influence whether you vote on November 20.’). The full set of messages (English translation) that were sent is presented in the Appendix to the paper (Tables A2).

³⁷ A contextual note is due on mobile phone coverage in Mozambique. Access to the detailed location of all the mobile communication antennas in the country in 2009 points to 87 percent of the population covered, if one takes the polling locations that were active in both 2004 and 2009. Our specific sample is mostly urban; hence, the 100 percent coverage.

performed within pairs.³⁸ The following step was selecting polling locations and assigning the newspaper treatment. In each of the 22 municipalities, we randomly drew a group of polling locations with equal probability given to all polling locations. We then selected randomly treatment and control groups of polling locations, through block randomization by which blocks were formed primarily within municipality.³⁹ This procedure led us to 198 polling locations. Due to the conflict situation with RENAMO, fieldworkers faced clear difficulties in Sofala province, where they were impeded to operate at this point. This is the reason we had to drop the municipalities of Beira and Dondo from our study. The corresponding polling locations (21) had to be substituted by (randomly drawn) additional polling locations in other municipalities covered in our experiment. The final number of polling locations in our experiment is 191, of a total of 331 possible polling locations in the municipalities covered by the experiment. The 191 polling locations were divided between 123 for newspaper distribution and 68 control. Figure 1 shows the 20 municipalities that were covered in our experiment.

In the enumeration areas defined as catchment areas of the polling locations, we conducted two face-to-face surveys, one before the elections, and one after. Sampling within each enumeration area followed random walks during the baseline survey.⁴⁰ However, selection

³⁸ This selection procedure was implemented in view of securing municipal-level variation for a study at that level, which is outside the scope of this paper.

³⁹ Note that these blocks were triplets of locations, as we randomized between (i) initial distribution of the newspaper by enumerators in the context of our baseline survey, (ii) initial distribution by a group of fieldworkers associated with @Verdade, (iii) no distribution of the newspaper or control.

⁴⁰ Namely, enumerators starting from the center of the enumeration area, typically the polling location, sought the *n*th houses along main routes.

of the household was conditional on the corresponding household having a mobile phone available for receiving or sending SMSs. In each of these households, enumerators selected a random adult member of the household, stratifying by gender. The baseline survey included 1530 respondents, on average eight per enumeration area. It took place from mid-October to the first week of the electoral campaign in November. The post-election survey started in early December, after the results were announced. It sought the same respondents, reaching 1251 of them. SMS treatments were randomized individually across baseline survey respondents. This randomization procedure was performed between the end of the baseline survey and the beginning of the SMS interventions in the last week of the electoral campaign to the November municipal elections.

This was the timing of the publication of our pre-analysis plan. All SMS treatment groups of Table C1 had the same weight in our randomization procedure. Note that the assignment of peer groups was also randomized within the pool of experimental subjects that had the required characteristics for each individual.⁴¹

⁴¹ Namely, intending to vote and similar or dissimilar (to receivers), in terms of gender and age. Note that assigned peers agreed during the baseline survey to share their voting intentions via SMS with other experimental subjects.



Figure 2: Experimental municipalities.

3.3.3. Theoretical approach and hypotheses

For the purpose of interpreting our experimental results, we introduce a simple model of political participation, building on the body of literature summarized by Dhillon and Peralta (2002) and Feddersen (2004). Let us assume that an individual i decides on a political behavior vector x_i , which we take as continuous for technical convenience. This includes

measures of sending text messages with political content, turning out to vote, and voting for the ruling party. Each citizen maximizes a payoff function:

$$\max_{x_i} E_{\Omega_i} U(G(x_i, x_{-i}), x_i) - C(x_i) \quad (11)$$

where $G(x_i, x_{-i})$ is the outcome of the electoral process, x_{-i} is the combined action of individuals other than i , Ω_i denotes i 's information set, and $C(x_i)$ is the total material cost of the action for individual i (e.g., cost of text messaging, transport cost to the polling station, opportunity cost of time). To capture non-instrumental motivations, we allow x_i to enter the function U independently from the outcome of the voting process G . We assume positive relations between x_i and U , both directly and via G , as well as between x_i and C .

Assuming well-behaved functions,⁴² the first order condition is

$$E_{\Omega_i} \left(\frac{\partial U}{\partial G} \frac{\partial G}{\partial x_i} + \frac{\partial U}{\partial x_i} \right) = \frac{\partial C}{\partial x_i} \quad (12)$$

which implicitly defines the solution of the citizen's problem.

All treatments in our experiment are meant to change citizens' information set Ω_i , as a mediator for political participation and voting for the electoral candidates. We claim that additional information about Mozambican politics and the specific election at stake, in the form of newspaper distribution and the sending of text messages, can increase the visibility of the election for citizens, and in that way show the importance of individual political

⁴² We imply continuity of all functions, strict concavity of U and strict convexity of C , with respect to x_i .

participation to affect the electoral outcome, $\partial E_{\Omega_i} \left(\frac{\partial U}{\partial G} \frac{\partial G}{\partial x_i} \right) / \partial \Omega_i > 0$.⁴³ Moreover, it can also increase the non-instrumental motivation of political participation $\partial E_{\Omega_i} \left(\frac{\partial U}{\partial x_i} \right) / \partial \Omega_i > 0$. Under our standard assumptions, both these types of effects increase voter participation.

In a context like the Mozambican one where there is overwhelming political dominance by the ruling party FRELIMO, leading to pervasive clientelism at the local level (e.g., Forquilha, 2009), it is likely that the electoral race turns into a contest across locations for the mobilization of FRELIMO supporters to vote. This mobilization, visible to all through voter turnout and the electoral results publicly available at the polling station level, may then be taken as the counterpart for local public good provision by the state after the election. If this is the main mechanism at work, the additional information embedded in the newspaper distribution and the sending of text messages is likely to have the same effects on voting for FRELIMO that we described above for political participation.⁴⁴

This model also shows that more information can reduce political participation if it lowers the probability of changing the electoral outcome,⁴⁵ i.e., if it lowers $E_{\Omega_i} \left(\frac{\partial U}{\partial G} \frac{\partial G}{\partial x_i} \right)$. For instance,

⁴³ The effect of individual political behavior on the political outcome can be small in large elections. This is related to the paradox of voting, which dates back at least to Downs (1957). However, different theoretical contributions have challenged this paradox (e.g., Palfrey and Rosenthal, 1983; Myatt, 2015). Moreover, we take a broad understanding of political behavior, including for instance political participation through the sending of SMSs, which goes well beyond the typical pivotal winning vote underlying the paradox of voting.

⁴⁴ An alternative explanation for a positive effect on voting for the ruling party FRELIMO is the direct association of the voter education (implied in the distribution of the newspaper and the text messages) with the government. Indeed, the electoral commission in Mozambique is often seen as controlled by FRELIMO.

⁴⁵ We consider as relevant electoral outcomes winning an electoral majority, but also, for instance, getting the ruling party turnout to a level that leads to more local public good provision after the election.

a citizen may decide not to vote if he/she learns that his/her preferred politician is guaranteed to be elected. This is particularly likely in the case of locations that get the newspaper, where citizens could think others are likely to vote more often (and for the ruling party). Then, text messages from peers nudging recipients to vote could remind these individuals that others are voting in large numbers, and in this way lead them to free-ride and stay at home. Alternatively, it could be that these SMSs from peers reinforce recipients' will to participate politically.

3.3.3.1. Hypotheses

We published a pre-analysis plan just before we submitted the SMS treatments in the week before the 2013 municipal elections. This is available at the research registration website of Evidence in Governance and Politics (EGAP).⁴⁶ All hypotheses analyzed in this paper were included in the pre-analysis plan.⁴⁷ We now turn to the description of our main hypotheses. We start by the hypotheses relating to the distribution of the newspaper. In line with our theoretical framework, we hypothesize that the distribution of the newspaper at the level of the polling location increases political participation and voting for the ruling party (Aker et al., 2017).

⁴⁶ <https://osf.io/ptv97>.

⁴⁷ Note, however, that, while we stated clear predictions for outcomes representing political participation like voter turnout, we were agnostic about predictions on specific voting patterns for the different candidates. Still, we mentioned we would be testing treatment effects on voting for candidates. In addition, although we stated we would be employing behavioral measures of political participation, we did not refer explicitly all our behavioral measures. In the Appendix to the paper, we refer additional hypotheses that were in the pre-analysis but not in the analysis of this paper.

We then turn to the hypotheses relating to the SMS treatments. Specifically, we state that SMS treatments are expected to increase political participation and voting for FRELIMO, but that peer reminders and encouragements are expected to be more powerful than simple reminders.⁴⁸ Consistently with the literature on get-out-the-vote campaigns (e.g., Gerber and Green, 2000), the rationale for these hypotheses is that reminders matter for political participation, and that the more personal they are the more influential they become.

We also propose hypotheses relating to the composition of the peer groups. We expect that men and older peers are most influential in terms of driving political behavior. Specifically, Mozambique is a country where traditional authorities, who have substantial influence (Buur and Kyed, 2005), are predominantly men and older than average household heads (e.g., Armand et al., 2020).⁴⁹ Moreover, similar groups of peers are likely to influence experimental subjects more than dissimilar ones.⁵⁰ Finally, we hypothesize that peer influence through text messages is less powerful in increasing political participation and voting for the ruling party in the presence of location-level political mobilization, as given by the distribution of newspapers. This is consistent with Fafchamps et al. (2020), who provide evidence suggesting free-riding of network-central individuals in face of location-level mobilization.

⁴⁸ Another hypothesis underlying our design and included in the pre-analysis plan is that peer encouragements are expected to be more powerful than peer reminders.

⁴⁹ Men and older respondents to the Afrobarometer survey data for Mozambique are also more likely to vote. Note that Centola (2011), in his experiment on the adoption of healthy behaviors, puts forward a hypothesis analogous to ours, related to influence by higher status peers, which has a prominent position in the wider literature on social networks.

⁵⁰ This is a homophily hypothesis, as humans are more likely to identify with similar people (e.g., Centola, 2011)

In their paper, these central individuals are subject to more network influence towards participation. Note, however, that in our paper we can distinguish centrality from peer influence, by isolating the causal effect of the latter.

3.3.4. Measurement

Our measurement of voting behavior at the polling location level comes from official data from STAE, including voter turnout (share of registered voters), blank votes (share of votes), and voting for the different candidates (share of votes). Note that we distinguish voting for the president of the municipality and for the municipal assembly, which had different ballot papers.

The individual measurement in our experiment comes from behavioral measures of political participation, specifically through the observed sending of SMSs by experimental subjects, from measures of voter turnout based on survey data and ballot box replication, and from measures of voting preferences from ballot box replication. We now describe the details of these measurements.

We begin by describing our (individual) behavioral measures of political participation. We asked experimental subjects to send SMSs concerning the municipal elections to the newspaper shortcode. We can identify the messages that were sent by each individual in our experiment by having access to the messages received in the shortcode and by matching mobile phone numbers. The sending of SMSs was costly in monetary terms: each SMS to the shortcode was priced at 3MT, i.e., close to 0.1USD. It was also costly in non-monetary terms, as senders had to spend some time/effort thinking about what to write and writing the

message on their mobile phones. Sending a text message therefore represents a clear costly action. It is arguably a better measure of political participation than corresponding survey questions, which are typically susceptible to social desirability bias.

Our first behavioral measure of political participation was created through establishing a hotline system. Our hotline was based on the dissemination of the newspaper shortcode and the invitation to send text messages reporting local electoral problems, which would be channeled to @Verdade. Information about the hotline system was given individually to all experimental subjects during the baseline survey. As part of these dissemination efforts, we distributed leaflets providing the basic information about the hotline system: shortcode, examples of problems, format of reports to be sent - specifically, label, polling location name first, description of the problem second -, and the sponsors of the initiative. The hotline leaflet is depicted in Figure A1 in Appendix. Each leaflet was printed on both sides of one page, with each side providing different SMS examples, one for the electoral campaign, and the other for the election day. Experimental subjects were also sent SMS reminders about the existence of the hotline system. We will employ in our analysis below a measure of whether our experimental subjects sent a hotline SMS.

Our second behavioral measure of political participation was gathered through an open letter system. During the post-election survey, all respondents were invited to send SMSs proposing policy priorities to the newly elected mayors. Experimental subjects were promised that the contents of these messages would reach the corresponding mayors in person, namely through @Verdade. As with the hotline, dissemination of the open letter was based on the distribution of a leaflet, which included two sides with two different examples

of possible messages, shortcode, format of the message (including label), and sponsors. The leaflet is depicted in Figure A2 in Appendix. Experimental subjects were also sent SMS reminders about the existence of the open letter system. We will employ in our analysis below a measure of whether our experimental subjects sent an open letter SMS, a proxy of the demand for political accountability from citizens. We also measure individual political participation from the sending of text messages related to the elections, as invited directly by the newspaper. The newspaper disseminated the shortcode on its own for general comments of their readers about the elections. For several years, every week, the newspaper has been publishing in its printed edition some of the comments received on its shortcode. Note that information about the sending of messages of this type is included in our aggregate behavioral analysis: both in our measure of whether our experimental subjects sent an SMS of any type (hotline, open letter, or by newspaper invitation), and in our measure of how many SMSs of any type they sent. We now devote our attention to the individual measures of voter turnout we employ in this paper. These are based on information gathered during the post-election survey.⁵¹ We dedicated a module of the questionnaire to asking questions about all details of the election-day experience of the respondent. We construct three alternative measures of individual turnout. The first measure is direct self-reported turnout. The second is an interviewer assessment on whether the respondent voted or not, after all questions about the election day were asked – enumerators were trained to watch body language as well. This

⁵¹ We were particularly careful with our measurement of voter turnout in view of existing concerns with the standard (direct) question on voter turnout from Afrobarometer surveys in Mozambique, which consistently overestimates actual voter turnout. See for instance the report for Afrobarometer's 2008 (round 4) Mozambican survey (Shenga and Pereira, 2008).

measure takes into consideration survey questions that tested the respondents' knowledge about ballot station facts: these included how many ballot papers there were, whether there were photos on the ballot papers, how many ballot boxes there were, whether a finger was to be inked at the end of the voting, and which finger was to be inked at the end of the voting.⁵² It also takes into account other reported details on the election-day experience of the respondent.⁵³ Finally, we asked our experimental subjects, during the submission of the post-election questionnaire, to replicate their voting at the municipal elections, by soliciting them to fill a copy of the ballot paper and by making available a transparent ballot box for vote insertion. Note that these transparent ballot boxes always had other ballot papers inside, even though experimental subjects were not told their replicated vote would be anonymous. Indeed, these ballot papers were marked, so that enumerators could identify each individual vote by experimental subjects. Those individuals that decided not vote in the replica ballot box were counted as not voting in our box measure of turnout.

⁵² Note that we prepared a measure of voter turnout based on observing whether the fingers of post-election survey respondents were inked. However, there were numerous complaints concerning the fact that the ink that was provided by the National Electoral Commission/STAE disappeared easily on the same day, allowing the possibility of voting more than once. We therefore decided not to use this measure.

⁵³ These included questions on: with whom the respondent went to vote; what the name of the polling location was, and how to get there; what the respondent did before and after voting; how long the respondent took to go from home to the polling location; what time the respondent voted; whether there was more than one ballot table in the polling locations; whether it was difficult to find the right ballot table; how long the respondent waited in line to vote; what happened when the respondent was waiting in line; how many people and who sat at the polling table; what happened when the respondent got to the polling table; whether the respondent could see anyone from the polling booth; whether ballot boxes were transparent and had different colors.

Turning to our individual measurement of voting for the different candidates/parties, as described above, we asked all respondents in our post-election survey to replicate their voting in the municipal elections, by using a copy of the ballot paper and a transparent ballot box. The enhanced sense of anonymity that this measurement is likely to entail may help producing accurate measures of voting. We employ below measures of voting for FRELIMO using the votes recorded in these ballot boxes.

3.3.5. Estimation strategy

Our empirical approach estimates treatment effects on the variety of outcome variables that we have available relating to voter turnout, voting for the different candidates/parties, and behavioral political participation. We now describe the main econometric specifications we employed for the estimation of these parameters. We focus on individual level regressions as the location-level ones we employ follow the same structure but at a higher level of aggregation.

Our design allows us to estimate average treatment effects. The effect of interest (β) can be estimated through the specification:

$$Y_{l,i,post} = \alpha + \theta X_{l,i} + \beta T_{l,i} + \varepsilon_{l,i,post}, \quad (13)$$

where Y is an outcome of interest, $l, i, post$ are identifiers for locations, individuals, and time - specifically, $post$ represents the post-election measurement -, ⁵⁴ $X_{l,i}$ is a vector of location

⁵⁴ Note that, in the regressions shown in the paper, we focus on simple-difference regressions (instead of difference-in-differences or ANCOVA). We do not have available baseline data for the behavioral political participation measures and for some of the measures on electoral behavior. Using data on the previous municipal

and individual (demographic) controls. $T_{l,i}$ is a vector of dummy variables representing the treatments with value 1 for treated units.

In some regressions, we are interested in interaction effects between different treatments, or between treatments and fundamental demographic characteristics like gender and age. In those occasions, we estimate a specification of the type that follows. Here, we exemplify by aiming for the estimation of the interaction between two treatments. The coefficient of interest would be δ .

$$Y_{l,i,post} = \alpha + \theta X_{l,i} + \beta T_l^{NEWS} + \gamma T_{l,i}^{SMS} + \delta T_l^{NEWS} \cdot T_{l,i}^{SMS} + \varepsilon_{l,i,post}, \quad (4)$$

where T_l^{NEWS} and $T_{l,i}^{SMS}$ are newspaper distribution and SMS treatments, respectively.

For ease of interpretation and transparency, we employ OLS estimations throughout the paper. We cluster standard errors at the level of the enumeration area in all regressions at the individual level.

On top of the pre-registration of our design, we take seriously the possibility of inference problems related to multiple hypothesis testing by employing the algorithm described in Romano and Wolf (2016). Specifically, we compute, for each null hypothesis under study, a corresponding p-value adjusted for the stepwise multiple hypothesis testing method proposed in Romano and Wolf (2005a,b). This method is stepdown like other improvements over Bonferroni (e.g., Holm, 1979), and resampling-based, which allows accounting for

elections would be problematic, as comparability cannot be guaranteed given different pools of candidates/parties in the two elections.

dependence between hypotheses. Hence, the underlying procedure allows increasing the power of the testing over other previous methods.

3.4. Econometric results

3.4.1. Balance and descriptive statistics

Tables C3 in the Appendix to this paper display mean demographic and political characteristics in the SMS and newspaper control groups, as well as differences between control and treatment groups. Specifically, we consider treatment groups defined by the location-level distribution of newspaper @Verdade, and by the type of SMS received (placebo, neutral, or positive) for each type of peer group (similar and dissimilar). We assess comparability across the different groups through testing the statistical significance of the differences to the corresponding control group. A joint F-Test is also displayed for each trait, resulting from a regression on dummy variables for each of the treatment groups included in the table. We employ a wide range of observable individual characteristics, based on data gathered during our baseline survey. These include basic demographics (gender, age, household size, marital status, and education), religion, ethnicity, occupation, assets owned by the household, and reported voting behavior in the 2009 general elections.

Overall, we observe few differences (at standard significance levels) between treatment and control groups. In terms of basic demographics, religion, and ethnicity, we see just one significant difference (and one significant joint F-test), for frequency of primary school, when contrasting distribution of the newspaper to its control group. There are no statistically significant differences (or significant joint F-tests) across the different SMS comparison groups. In terms of occupation and asset ownership, when considering the newspaper, we

report one significant difference for being an artisan; when considering SMS treatments, we observe two significant differences for being a farmer and for owning a bike, and one significant difference for owning a mobile phone. We do not find any statistically significant differences when taking reported behavior in the 2009 elections. No joint F-tests are significant for occupation, asset ownership, and political behavior. We note that, for each treatment group considered, we have at most two statistically significant differences to the control in 32 characteristics. Overall, just seven differences to control are significant in 224 differences tested, and just one joint F-test is significant in 32 tests performed. The number of significant tests is well below the 10 percent threshold in any dimension considered. This is evidence that the randomization procedures were effective at isolating similar groups of respondents.

Tables C3 in Appendix also provide a comprehensive description of our experimental sample. It is worth noting that the average respondent in the SMS control group was 32 years old. Ninety-five percent of these individuals reported having some education. The main ethnicities represented were Macua (the dominant group in the North) and Changana (the dominant group in the South). 96 percent of the experimental households owned a mobile phone.⁵⁵ 90 percent of registered voters reported to have voted in the 2009 general elections.

3.4.2. Newspaper treatment

⁵⁵In addition, we note that more than 80 percent of our survey respondents report using mobile phones every day.

We now turn to analyzing treatment effects and start by the impact of the newspaper treatment, as given by the location-level distribution of @Verdade. We assess treatment effects on the official electoral results at the polling location level in Table 10. These results include voter turnout, blank votes, and voting for FRELIMO and MDM, while distinguishing between elections for the President of the Municipality (PM) and for the Municipal Assembly (MA). This analysis serves the purpose of testing our first main hypothesis, i.e., that the newspaper distribution at the level of the polling location increases political participation. We also see if, consequently, voting for FRELIMO increases. We consider both the full sample of all polling stations in the municipalities where the study was conducted, and the sample where surveying was conducted. Since polling locations within these municipalities were randomly drawn, both samples are valid for experimental inference. We employ specifications with demographic controls aggregating traits at the level of the enumeration area in the case of the sample where surveys were conducted.

We find clear positive effects of the newspaper treatment on voter turnout. This is a 6 percentage-point effect, across both types of elections, when considering the full sample. This effect is significant at the 1 percent level (also when performing multiple hypothesis testing). When considering the surveyed sample, we observe a 3–4 percentage-point effect in the specification with controls, which is marginally significant. When considering effects on blank votes, we find that all point estimates are negative in line with the idea that treated voters had more information about how to vote meaningfully. Some of the effects for blank votes are statistically significant: point estimates are 0.5 percentage points when employing the surveyed sample, with significance at the 10 percent level (however, statistical

significance does not survive multiple hypothesis testing).⁵⁶ We also find positive effects on voting for FRELIMO: the magnitude is 5 or 9 percentage points (depending on the election), significant at the 1 percent level, while passing multiple hypothesis testing, when employing the full sample. When significant, effects on voting for MDM are correspondingly negative. Generally, we can conclude in favor of our hypotheses regarding the electoral results, i.e., that the newspaper distribution led to higher voter turnout, and more voting for FRELIMO, in line with our theoretical framework. Both findings are in line with previous literature.

Table 10: Effects of newspaper treatment on political behavior - administrative data

Dependent variable -->	Turnout share		Blank votes share		Voting share			
	PM	MA	PM	MA	Frelimo PM	Frelimo MA	MDM PM	MDM MA
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Panel A: full sample</i>								
Treatment effect	0.057***	0.058***	-0.003	-0.002	0.092***	0.048***	0.008	-0.038**
	(0.016)	(0.016)	(0.002)	(0.002)	(0.026)	(0.015)	(0.012)	(0.016)
RW p-value	0.005	0.002	0.264	0.308	0.005	0.004	0.494	0.026
Mean dep. var. (control)	0.405	0.404	0.031	0.028	0.494	0.575	0.235	0.328
R-squared adjusted	0.468	0.465	0.262	0.151	0.585	0.570	0.760	0.505
Number of observations	331	331	331	331	331	331	331	331
Controls	no	no	no	no	no	no	no	no
<i>Panel B: surveyed sample</i>								
Treatment effect	0.033*	0.035*	-0.005*	-0.005*	0.032	0.024	0.002	-0.012
	(0.019)	(0.019)	(0.003)	(0.003)	(0.027)	(0.017)	(0.015)	(0.019)
RW p-value	0.283	0.219	0.283	0.219	0.419	0.219	0.895	0.499
Mean dep. var. (control)	0.449	0.449	0.035	0.032	0.614	0.636	0.228	0.263
R-squared adjusted	0.367	0.368	0.276	0.225	0.479	0.590	0.715	0.597
Number of observations	191	191	191	191	191	191	191	191
Controls	yes	yes	yes	yes	yes	yes	yes	yes

Note: OLS regressions. Treatment defined at the location level as having received newspaper @Verdade. PM - President of the Municipality; MA - Municipal Assembly. All dependent variables are shares of registered voters (turnout) or votes (other variables). Specifications without and with controls include province dummies. Controls are: mean gender, mean age, mean household size, mean education, mean employment of the sample of the enumeration area. Robust standard errors reported in parenthesis. We show p-values from applying the Romano-Wolf resampling-based stepdown multiple testing procedure by election type (PM and MA) in this table. * significant at 10%; ** significant at 5%; *** significant at 1%.

⁵⁶ We also have access to the share of null votes in the official results. All treatment effects are negative in line with our interpretation for blank votes. However, none is statistically significant.

3.4.3. SMS treatments

We now dedicate to analyzing the impact of the SMS treatments on our behavioral measures of political participation, on our measures of voter turnout, and on voting decisions as given by the pattern of voting in our replicated ballot box. In Table 11, we test whether the text messages increased political participation. By political participation, we mean whether individuals sent a hotline SMS, an open letter SMS, or any text message to the newspaper shortcode. We also consider the total number of text messages sent by individuals. Voter turnout is the most obvious measure of political participation we employ: we include as specific outcome measures of voter turnout the self-reported survey measure, the interviewer final assessment of whether the respondent voted (informed by all the survey questions on the election day), and whether individuals voted in our replicated ballot box. We also check whether the text messages changed voting for FRELIMO candidates in the replicated ballot box. All outcome variables we consider are binary except the number of SMS that was sent by our experimental subjects. Our treatment effect contrasts the group that includes all individuals assigned an SMS treatment in our experiment to the SMS control group. We show regressions with individual demographic controls, following specification (3). First, we should note that 3 percent of the SMS control group sent a hotline message, 3 percent sent an open letter message, and 15 percent sent any message. We also see that the average number of messages sent by experimental subjects in the control group was 0.22. Self-reported turnout in the SMS control group was 83 percent, which compares to 67 percent in the interviewer assessment, and 82 percent in the box measure. Actual turnout in the polling locations without newspaper distribution in our experiment was 46 percent. Although our

sampling is not representative of the voting population, it is then very likely that our survey self-reported measure embeds a considerable over-estimation of turnout. We can also observe that 91 percent of the SMS control voters in our replicated procedure voted for FRELIMO. It is also very likely that voting for FRELIMO is over reported as actual figures from the polling locations without newspaper distribution in our experiment were 65 percent voting for FRELIMO.

We find solid effects of the SMS treatments on increasing the probability of sending a text message of any type and the number of text messages of any type. The treatment effects are an increase of 7.6 percentage points in the probability of sending an SMS, statistically significant at the 5 percent level, and an increase in 0.31 in the number of messages sent, significant at the 1 percent level. Note that the second of these treatment effects also passes the Romano-Wolf procedure for multiple hypothesis testing, which we apply to the two groups of outcome variables in the table. We also see effects on all our voter turnout measures. These effects are positive and range between 7.1 (self-reported), 8.3 (interviewer assessment), and 7.6 percentage points (box). They also pass multiple hypothesis testing. We observe no statistically significant differences in voting for FRELIMO in the replicated voting procedure we adopted. We can safely conclude that, overall, SMSs lead to higher levels of political participation.⁵⁷

⁵⁷ This overall conclusion is confirmed when aggregating our outcome variables employing the method in Kling et al. (2007). We show results in Figure A3 in the Appendix to this paper, which employs the same aggregation we adopt when implementing the Romano-Wolf multiple hypothesis testing, while distinguishing turnout and voting for FRELIMO. We reach the conclusion that SMS treatments increase both the behavioral political participation measured through the SMSs, and individual turnout.

Table 11: Effects of any SMS treatment on political behavior

Dependent variable -->	Behavior				Electoral outcomes			
	Hotline	Open letter	Any SMS	Number of SMS	Turnout			Voting
					Self-reported	Interviewer	Box	Box Frelimo
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treatment effect	-0.01 (0.016)	-0.005 (0.017)	0.076** (0.036)	0.307*** (0.081)	0.071* (0.041)	0.083* (0.050)	0.076* (0.043)	0.014 (0.028)
RW p-value	0.637	0.696	0.118	0.027	0.096	0.096	0.096	0.499
Mean dep. var. (control)	0.032	0.032	0.151	0.222	0.831	0.674	0.821	0.913
R-squared adjusted	0.005	0.011	0.009	0.017	0.017	0.039	0.024	0.166
Number of observations	1251	1251	1251	1251	925	925	863	770
Controls	yes	yes	yes	yes	yes	yes	yes	yes

Note: OLS regressions. Treatment defined as receiving any SMS treatment. All dependent variables are binary, except number of SMS. All regressions include province dummies and controls. Controls are: gender, age, household size, education, and employment status. Clustered standard errors by enumeration area reported in parenthesis. We show p-values from applying the Romano-Wolf resampling-based stepdown multiple testing procedure with clustered standard errors by enumeration area to the two groups of outcome variables in this table. * significant at 10%; ** significant at 5%; *** significant at 1%

In Table C4 in the Appendix, we distinguish the differences between control and each of the nine SMS treatments we have in our experiment. We see that significant differences are not clearly clustered on any type of treatment, except perhaps for non-placebo groups. Significant treatment effects are only for behavioral SMS and turnout outcomes. We now devote finer attention to different types of SMS treatments. In Figure A4 in the Appendix to this paper, we analyze whether neutral and positive SMSs (reminders and encouragements) from peers have a stronger impact on participation than placebo SMSs (simple reminders), whether neutral SMSs (reminders) from peers have an effect over placebo SMSs (simple reminders), and whether positive SMSs (encouragements) from peers have a stronger impact on

participation than neutral SMSs (reminders) from peers.⁵⁸ Overall, we have suggestive evidence that SMSs labeled as coming from peers have a positive effect on political participation.⁵⁹ This weak effect, if anything, seems to be associated to peer reminders (neutral messages). The effect of peer encouragements (positive messages) over peer reminders is clearly not positive and so different from our hypothesis. Overall, we conclude that some SMS interventions we study in this paper modified aspects of the voter participation in the municipal elections of November 2013. Specifically, on average, the SMS treatments led to an increase in the sending of SMS relating to the elections and the turnout of voters.

3.4.4. Peer influence

In this section, we turn to peer influence, while exploring in further detail the SMSs originating from peers. We divide our attention between the effects of the peer characteristics conveyed in the messages, and the effects of the peer messages in the presence of location-wide mobilization of voters through the distribution of newspapers.

⁵⁸ We analyze the same outcome variables as before, and just show, for simplicity, treatment effects with corresponding confidence intervals at the 95 percent level. Note that the regressions we employ here do not include the SMS control group. They also do not include groups with positive messages in panel B and groups with placebo messages in panel C. All regressions considered include controls as in specification (1).

⁵⁹ Specifically, we observe a statistically significant positive effect on the number of behavioral SMSs sent: the magnitude is 0.21 more messages sent, significant at the 10 percent level. However, the Romano-Wolf p-value is above 10 percent. We also find positive impacts on other behavioral SMS outcomes and in most turnout measures: however, these are not statistically significant. Close to statistical significance is also a positive effect on voting for FRELIMO, but, again, this is only suggestive.

Table 12 is devoted to the impact of peer characteristics. We test whether neutral and positive SMSs (reminders and encouragements) from men and older subjects have stronger effects than neutral and positive SMSs from women and younger subjects. Specifically, we interact two dummy variables for neutral or positive messages coming from similar groups of peers, and neutral or positive messages coming from dissimilar groups of peers⁶⁰ with gender and age dummies, while controlling for all mentioned variables in isolation. Following our hypothesis, we expect that both the interaction of similar and male/old and the interaction of dissimilar and female/young are positive for political participation and voting for FRELIMO. We are also able to test for homophily, i.e., that neutral and positive SMSs from similar peers have stronger effects than neutral and positive SMSs from dissimilar ones. All regressions include demographic controls following a specification analogous to (2) above.

⁶⁰ The value 0 on both dummies is assigned to receiving placebo messages, as the SMS control group is excluded from analysis.

Table 12: Effects of peer SMS treatment on political behavior

Dependent variable -->	Behavior				Electoral outcomes			
	Hotline	Open letter	Any SMS	Number of SMS	Turnout		Voting	
					Self-reported	Interviewer	Box	Box Frelimo
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Similar*male (a)	0.015	0.020	0.090	0.334**	0.068	0.126*	0.018	-0.024
	(0.018)	(0.023)	(0.055)	(0.169)	(0.044)	(0.068)	(0.044)	(0.040)
RW p-value	0.556	0.556	0.248	0.240	0.335	0.174	0.802	0.802
Dissimilar*female (b)	0.016	0.018	0.060	0.346*	-0.024	-0.125*	-0.046	0.044
	(0.018)	(0.018)	(0.049)	(0.192)	(0.043)	(0.066)	(0.047)	(0.034)
RW p-value	0.591	0.591	0.530	0.713	0.581	0.148	0.581	0.581
Similar*old (c)	-0.005	-0.009	-0.034	-0.110	0.013	0.017	0.014	0.095**
	(0.016)	(0.021)	(0.057)	(0.191)	(0.043)	(0.061)	(0.045)	(0.045)
RW p-value	0.929	0.929	0.929	0.929	0.978	0.978	0.978	0.074
Dissimilar*young (d)	-0.019	-0.010	0.018	0.032	0.020	0.034	-0.075	0.029
	(0.020)	(0.017)	(0.054)	(0.178)	(0.043)	(0.059)	(0.047)	(0.041)
RW p-value	0.674	0.893	0.895	0.895	0.850	0.850	0.340	0.850
Similar (e)	0.007	-0.012	-0.025	0.022	-0.045	-0.066	-0.018	0.010
	(0.011)	(0.018)	(0.048)	(0.120)	(0.042)	(0.051)	(0.041)	(0.037)
Dissimilar (f)	0.001	0.021	-0.009	-0.097	-0.006	0.057	0.082*	-0.012
	(0.018)	(0.013)	(0.045)	(0.179)	(0.031)	(0.046)	(0.042)	(0.030)
Male	0.014	0.007	-0.027	0.030	-0.018	-0.088	-0.003	-0.006
	(0.016)	(0.019)	(0.053)	(0.163)	(0.042)	(0.070)	(0.047)	(0.046)
Old	0.008	-0.001	0.102*	0.311*	0.035	0.061	-0.033	-0.054
	(0.016)	(0.018)	(0.061)	(0.175)	(0.046)	(0.067)	(0.048)	(0.052)
Constant	0.006	0.032	0.194**	0.369	0.906***	0.778***	0.876***	0.959***
	(0.036)	(0.040)	(0.086)	(0.305)	(0.084)	(0.137)	(0.087)	(0.061)
R-squared adjusted	0.003	0.016	0.013	0.021	0.006	0.043	0.014	0.174
Number of observations	1125	1125	1125	1125	836	836	779	701
H0: (a) + (b) = 0 F-stat p-value	0.254	0.204	0.042	0.009	0.492	0.994	0.669	0.688
H0: (c) + (d) = 0 F-stat p-value	0.333	0.522	0.832	0.764	0.583	0.568	0.343	0.055
H0: (a) + (c) + (e) = 0 F-stat p-value	0.328	0.990	0.487	0.106	0.334	0.146	0.723	0.021
H0: (b) + (d) + (f) = 0 F-stat p-value	0.879	0.024	0.072	0.017	0.799	0.559	0.316	0.059

Note: OLS regressions. Similar and dissimilar treatments defined, respectively, as receiving SMSs (neutral or positive) from the similar peer group, and as receiving SMSs (neutral or positive) for the dissimilar peer group. Values 0 are defined for placebo SMSs. All dependent variables are binary, except number of SMS. All regressions include province dummies and controls. Controls are: gender, age, household size, education, and employment status. Clustered standard errors by enumeration area reported in parenthesis. We show p-values from applying the Romano-Wolf resampling-based stepdown multiple testing procedure with clustered standard errors by enumeration area to the two groups of outcome variables in this table. * significant at 10%, ** significant at 5%, *** significant at 1%.

We observe that male subjects seem to be influencing peers to send more messages: both interaction coefficients are positive (magnitude is 0.33–0.35 more messages) and statistically significant at the 5 or 10 percent levels. Note however that the Romano-Wolf p-values are above standard levels. Moreover, the test of the null that the sum of the two coefficients is zero shows that male subjects also influence their peers in terms of increasing the probability of sending an SMS of any type. We similarly find a positive and significant effect on voter turnout of neutral or positive messages originating from males on males. However, we find a negative and significant effect of males on female turnout. Both effects are for the measure of turnout based on interviewer assessments and are close to significance when considering the p-values of multiple hypothesis testing. On the patterns relating to age, we can document that old subjects seem to influence old peers, through neutral and positive messages, to vote more for FRELIMO. The magnitude is 10 percentage points, significant at the 5 percent level, while passing multiple hypothesis testing. The overall effect of old peers (counting with both effects on young and old recipients of messages) is also positive and statistically significant. Relating to the impact of peer similarity, assessed through the tests at the bottom of Table 12, we do not find a clear pattern of effects: although similar peers influence voters to vote for FRELIMO, dissimilar peers lead SMS recipients to sending more open letter messages.

We now focus on the interaction of the peer SMS treatments with the newspaper distribution. In Table 13, we check impact on the variables relating to individual political behavior as we employed before. We test the hypothesis that neutral and positive SMSs by peers (reminders and encouragements), relative to placebo SMSs (simple reminders), have a weaker effect for

subjects targeted by newspaper distribution at the location-level. Our analysis includes regressions with control variables following specification (4) above.

Table 13: Interaction effects between peer SMSs and newspaper distribution on political behavior

Dependent variable -->	Behavior				Electoral outcomes			
	Hotline	Open letter	Any SMS	Number of SMS	Turnout			Voting
					Self-reported	Interviewer	Box	Box Frelimo
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Newspaper*SMS	0.011 (0.026)	0.053* (0.029)	0.038 (0.081)	0.297 (0.252)	0.117** (0.051)	0.089 (0.094)	0.184*** (0.057)	0.074 (0.063)
RW p-value	0.777	0.185	0.777	0.358	0.026	0.23	0.006	0.23
Newspaper	-0.020 (0.023)	-0.044 (0.027)	-0.060 (0.079)	-0.242 (0.242)	-0.132*** (0.047)	-0.099 (0.095)	-0.188*** (0.052)	-0.067 (0.064)
SMS	0.009 (0.025)	-0.020 (0.028)	0.001 (0.067)	0.027 (0.241)	-0.084*** (0.017)	-0.018 (0.068)	-0.098*** (0.020)	0.003 (0.047)
Constant	0.010 (0.041)	0.081* (0.048)	0.233** (0.099)	0.419 (0.405)	0.938*** (0.071)	0.691*** (0.131)	0.934*** (0.085)	0.984*** (0.061)
R-squared adjusted	0.001	0.017	0.007	0.017	0.010	0.037	0.021	0.166
Number of observations	1125	1125	1125	1125	836	836	779	701

Note: OLS regressions. The SMS treatment is defined as having received a peer SMS treatment (neutral or positive). The pure control SMS condition is excluded from the analysis. The newspaper treatment is defined at the location level as having received newspaper @Verdade. All dependent variables are binary, except number of SMS. All regressions include province dummies and controls. Controls are: gender, age, household size, education, and employment status. Clustered standard errors by enumeration area reported in parenthesis. We show p-values from applying the Romano-Wolf resampling-based stepdown multiple testing procedure with clustered standard errors by enumeration area to the two groups of outcome variables in this table. * significant at 10%; ** significant at 5%; *** significant at 1%.

Overall, we can observe positive interaction effects. These effects are significant for two measures of turnout, self-reported and box, with magnitudes between 12 and 18 percentage points, at the 1 or 5 percent levels. Note that both measures of turnout pass multiple hypothesis testing. We also find significant interactions (although not surviving the Romano-Wolf procedure) for the likelihood of sending the open letter, with magnitude 5 percentage points. Finally, we find positive point estimates on voting for FRELIMO, which approach

but do not reach statistical significance at standard levels. We therefore cannot find evidence in favor of a free-riding hypothesis (Fafchamps et al., 2020): in fact, we find evidence for a more positive impact of peer influence, in face of location-level mobilization of voters as given by newspaper distribution.

Our design enables the identification of causal effects of peer characteristics and messages, which is unusual in the literature. We conclude from our analysis of messages coming from peers that males positively influence the political participation of others, and that older subjects drive their peers to vote for FRELIMO. We also observe complementarity of peer messages with location-wide information and mobilization given by the newspapers. Although the latter is different from what Fafchamps et al. (2020) found, it may be seen as unsurprising. These authors found that individuals with stronger networks voted less often when faced with location-wide information/mobilization and interpreted this negative interaction effect as free-riding. This is because more central individuals anticipate that voter turnout is likely to increase. However, centrality may have different meanings. Centrality may mean our subjects receive more peer influence (as in our SMS treatments). However, it may also mean that they are more aware of location-level mobilization efforts. Indeed, if they are more aware of these efforts, they may well free ride on others' increased voter turnout. That does not mean peer influence cannot have a positive impact on top of location-level mobilization of voters, as we find clearly in this paper.

3.5. Concluding remarks

In this paper, we tested the role of information, GOTV messages, and peer influence on political behavior. This testing was achieved in the context of a field experiment conducted

in Mozambique during the municipal elections of 2013. We followed the distribution of free newspaper @Verdade. We also assigned random peers to experimental subjects and tested the impact of several types of text messages focusing on voter turnout, some of them explicitly from peers. We find positive effects of newspaper distribution on voter turnout and voting for FRELIMO at the polling location level, while employing official results. We also observe clear effects of GOTV text messaging on political participation including voter turnout. Regarding peer influence, we establish causal effects of male peers on increasing the level of participation of others, and of older peers on driving voters to vote for FRELIMO. Finally, we find that peer GOTV produces stronger political participation when experimental subjects are mobilized at the level of the location.

Looking at the results of this paper, we infer that the distribution of free newspapers, as well as SMSs providing information about the elections and mobilizing voters to vote, are effective at producing political participation. We detect effects on voter turnout of newspaper distribution between 3 and 6 percentage points (location data), and of our average SMS between 7 and 8 percentage points (individual data). Both are comparable to the effects found during the 2009 elections (Aker et al., 2017). For policy makers interested in increasing the levels of political participation in Mozambique and similar contexts, we can then provide reassurance that these forms of voter mobilization and education are effective. However, we add two specific implications armed with the strength of causal identification: (i) peer influence from older and male individuals is particularly effective, namely in driving political participation and votes for the ruling party; (ii) peer influence may be complementary to location-level political mobilization efforts. The first implication is of particular importance

when targeting information campaigns. The second implication should provide encouragement that providing platforms for peer influence, even side-by-side with the general provision of information, is likely to magnify political participation.

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Chapter 1

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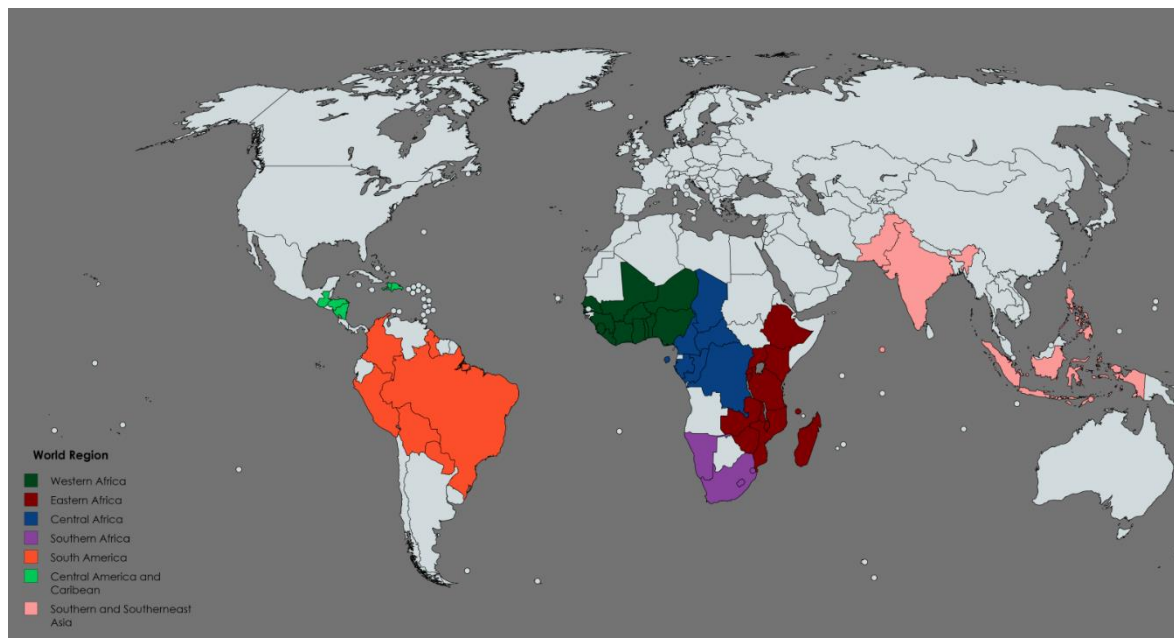
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Appendix A

Figure A1 – Countries included in the analysis



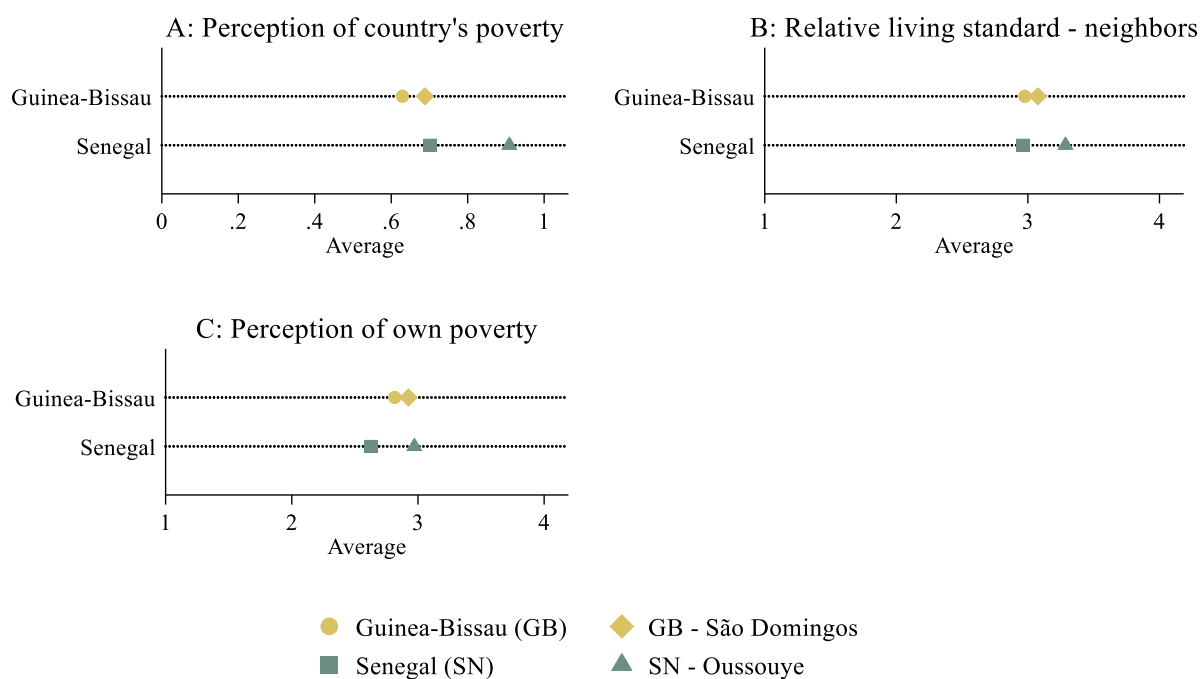
Appendix B

Figure B1: Map of the Jola settlement (source: Baum, 1999)



Map 1. Senegal, 1997

Figure B2 – Perceived living standards



Note: Data from the World Bank - Living Standards Measurement Survey in 2018. The graph plots the average answers by country (Guinea-Bissau and Senegal) and sector/department of interest (São Domingos and Oussouye). Question A: Do you think Guinea-Bissau/Senegal is a poor country?; Answers A: 0 - No/1 -Yes. Question B: How do you live in relation to the neighbors in the locality?; Answers B: 1 - Visibly better/2 - A little better/3 - Similarly/4 - Worse. Question C: If you were asked to classify your household in a wellness scale from poor to rich, how would you classify?; Answers C: 1 - Rich/2 - Medium/3 - Poor/4 - Very poor.

Table B1 - Panel A: Individual characteristics - difference across treatment dimensions

	Experiment				Country	
	No Inequality (control)	Disadvantageous Inequality	Advantageous Inequality	F-test	Guinea-Bissau (control)	Senegal
Female	0.487	-0.078 (0.069)	0.004 (0.065)	0.435	0.488	-0.048 (0.065)
Age	42.319	-2.116 (2.482)	2.772 (2.858)	0.200	41.052	3.045 (2.179)
Household size	7.892	-0.773* (0.452)	0.09 (0.499)	0.108	7.618	0.09 (0.391)
Married	0.700	-0.027 (0.098)	-0.027 (0.092)	0.966	0.751	-0.144** (0.073)
Jola	0.283	-0.002 (0.168)	-0.012 (0.157)	0.997	0.006	0.558*** (0.092)
Bayote	0.308	0.028 (0.19)	0.14 (0.185)	0.742	0.376	-0.024 (0.147)
Felupe	0.333	0.039 (0.203)	-0.072 (0.184)	0.838	0.618	-0.606*** (0.114)
Catholic	0.442	0.026 (0.089)	-0.029 (0.111)	0.845	0.439	0.002 (0.08)
Traditional religion	0.300	0.094 (0.08)	0.067 (0.1)	0.509	0.345	0.018 (0.071)

Note: Standard errors of the differences to corresponding control groups reported in parenthesis. The fourth column displays the p-value of an F-test of joint significance resulting from a regression on dummy variables for each of the experimental treatment groups included in the table. All regressions are clustered by session. Female is a dummy variable equal to 1 if individual is female and 0 otherwise. Age is a continuous variable of age. Household size is a continuous variable of the number of people that live in the household. Married is a dummy variable equal to 1 if the individual is married or in a union and 0 otherwise. Jola is a dummy variable equal to 1 if the individual is jola and 0 otherwise. Bayote is a dummy variable equal to 1 if the individual is bayote and 0 otherwise. Felupe is a dummy variable equal to 1 if the individual is felupe and 0 otherwise. Catholic is a dummy variable equal to 1 if the individual is catholic and 0 otherwise. Traditional religion is a dummy variable equal to 1 if the individual is of a traditional religion and 0 otherwise.

Table B1 - Panel B: Individual characteristics - difference across treatment dimensions

	Experiment				Country	
	No Inequality (control)	Disadvantageous Inequality	Advantageous Inequality	F-test	Guinea-Bissau (control)	Senegal
No schooling	0.367	-0.076* (0.060)	-0.003 (0.076)	0.38	0.376	-0.066 (0.058)
Primary schooling	0.492	0.017 (0.079)	-0.037 (0.083)	0.842	0.399	0.173*** (0.058)
Secondary and Upper Schooling	0.217	0.002 (0.063)	0.029 (0.073)	0.916	0.127	0.200*** (0.048)
Farmer	0.617	0.109 (0.081)	0.112 (0.070)	0.237	0.784	-0.192*** (0.056)
Student	0.07	0.044 (0.058)	0.015 (-0.043)	0.733	0.042	0.094** (0.041)
Informal vendor	0.078	-0.069* (0.036)	-0.041 (0.042)	0.116	0.024	0.038 (0.029)
Has job	0.212	-0.011 (0.061)	0.064 (0.072)	0.448	0.257	-0.059 (0.052)
Migration	0.087	-0.022 (0.035)	0.024 (0.042)	0.436	0.129	-0.086*** (0.026)
Family in the neighboring country	0.814	-0.025 (0.078)	-0.032 (0.086)	0.905	0.948	-0.312*** (0.047)

Note: Standard errors of the differences to corresponding control groups reported in parenthesis. The fourth column displays the p-value of an F-test of joint significance resulting from a regression on dummy variables for each of the experimental treatment groups included in the table. All regressions are clustered by session. No schooling is a dummy variable equal to 1 if the individual had No schooling and 0 otherwise. Primary schooling is a dummy variable equal to 1 if the individual completed primary schooling and 0 otherwise. Secondary and upper schooling is a dummy variable equal to 1 if the individual had secondary and upper schooling and 0 otherwise. Farmer is a dummy variable equal to 1 if the individual is a farmer and 0 otherwise. Student is a dummy variable equal to 1 if the individual is a student and 0 otherwise. Informal vendor is a dummy variable equal to 1 if the individual is an informal vendor and 0 otherwise. Has job is a dummy variable equal to 1 if the individual has a job and 0 otherwise. Migration is a dummy variable equal to one if the individual has migrated and 0 otherwise. Family in the neighboring country is a dummy variable equal to 1 if an individual that lives in Senegal/Guinea Bissau has family living in Guinea Bissau/Senegal.

Table B1 - Panel C: Individual characteristics - difference across treatment dimensions

	Experiment				Country	
	No Inequality (control)	Disadvantageous Inequality	Advantageous Inequality	F-test	Guinea-Bissau (control)	Senegal
Access to food	1.842	-0.114 (0.187)	0.131 (0.133)	0.386	1.780	0.148 (0.128)
Access to water	1.966	0.236 (0.205)	0.125 (0.202)	0.476	2.200	-0.242 (0.166)
Access to medicine	2.718	0.02 (0.257)	0.016 (0.272)	0.999	2.373	0.730*** (0.167)
Access to cooking gas	1.857	-0.013 (0.179)	0.069 (0.181)	0.890	1.831	0.084 (0.153)
Daily expenses per capita	278.37	-137.34 (108.43)	-77.135 (137.065)	0.316	227.999	-39.803 (94.021)

Note: Standard errors of the differences to corresponding control groups reported in parenthesis. The fourth column displays the p-value of an F-test of joint significance resulting from a regression on dummy variables for each of the experimental treatment groups included in the table. All regressions are clustered by session. Access to food/water medicines/cooking gas are scales from 1-5, with 1 indicating good access to food/water medicines/cooking gas and 5 indicating extreme lack of access to food/water medicines/cooking gas. Daily expenses (CFA) per capita is a continuous variable of households' daily expenses of the individual.

Table B2 - Antisocial behavior (lasso regression)

	Amount burned (CFA)		Amount burned - positive (CFA)		Expectation of being burned	
	(1)	(2)	(3)	(4)	(5)	(6)
Disadvantageous inequality (a)	-20.495 (47.118)	-49.556 (60.055)	-61.354 (48.525)	-25.717 (77.040)	-0.088 (0.075)	-0.015 (0.102)
Advantageous inequality (b)	-176.819*** (40.973)	-122.016** (50.921)	-243.403*** (41.423)	-123.213** (53.003)	0.069 (0.075)	0.122 (0.104)
Senegal	87.201 (157.316)	95.489 (158.474)	182.746** (74.125)	246.850*** (75.029)	0.114 (0.209)	0.184 (0.219)
Senegal*Dis inequality (c)		61.629 (94.772)		-77.425 (100.324)		-0.162 (0.150)
Senegal*Adv inequality (d)		-122.192 (83.481)		-229.360*** (78.294)		-0.117 (0.152)
H0: (a)-(b)=0 F-stat p-value	0.000	0.167	0.000	0.136	0.037	0.182
H0: (c)-(d)=0 F-stat p-value		0.016		0.061		0.757
Mean dependent variable	260	260	481.481	481.481	0.417	0.417
Number of observations	283	283	165	165	278	278
Potential controls	23	23	23	23	23	23
Number of controls selected	9	9	4	4	8	8

Note: Lasso regressions. Dependent variable in columns (1)-(2) is discrete, it takes the values of 0, 250, 500, 750, and 1000 CFA. Dependent variable in columns (3)-(4) is discrete, it takes the values of 250, 500, 750, and 1000 CFA. Dependent variable in columns (5)-(6) is a dummy variable equal to 1 if the individual expected to be burned by their partner and 0 otherwise. Senegal is a dummy variable equal to 1 if the participant is from Senegal and 0 if they are from Guinea-Bissau. Disadvantageous inequality is a dummy variable equal to 1 if the individual received the disadvantageous inequality treatment and 0 otherwise. Advantageous inequality is a dummy variable equal to 1 if the individual received the advantageous inequality treatment and 0 otherwise. Senegal*Dis inequality is the interaction term between Senegal and the treatment disadvantageous inequality. Senegal*Adv inequality is the interaction term between Senegal and advantageous inequality. Standard errors are clustered by session. All regressions have location controls. * significant at 10%; ** significant at 5%; *** significant at 1%

Table B3 - Survey outcomes (lasso regression)

	Violence justified		National vs Ethnic identification		Preferences for inequality	
	(1)	(2)	(3)	(4)	(5)	(6)
Disadvantageous inequality (a)	-0.643* (0.358)	-0.422 (0.538)	0.01 (0.161)	-0.024 (0.164)	0.125 (0.215)	0.068 (0.315)
Advantageous inequality (b)	-0.302 (0.331)	-0.560 (0.504)	0.057 (0.165)	0.197 (0.179)	0.090 (0.218)	0.107 (0.281)
Senegal	4.532*** (0.769)	4.565*** (0.773)	1.089** (0.530)	1.133** (0.549)	0.149 (0.575)	0.127 (0.609)
Senegal*Dis inequality (c)		0.583 (0.635)		-0.311 (0.339)		-0.038 (0.427)
Senegal*Adv inequality (d)		-0.469 (0.698)		0.072 (0.331)		0.123 (0.425)
H0: (a)-(b)=0 F-stat p-value	0.388	0.811	0.780	0.214	0.868	0.896
H0: (c)-(d)=0 F-stat p-value		0.165		0.244		0.689
Mean dependent variable	9.380	9.380	2.880	2.880	3.180	3.180
Number of observations	283	283	283	283	282	282
Potential controls	23	23	23	23	23	23
Number of controls selected	11	11	9	9	10	10

Note: Note: Lasso regressions. Dependent variable in columns (1)-(2) is a scale from 1-15 of violence justification (1 – violence is never justified, 15 – violence is always justified). Dependent variable in columns (3)-(4) is a scale from 1-5 of national vs ethnic identification (1 – national identification only, 5 ethnic identification only). Dependent variable in columns (5)-(6) is a scale of 1-5 of preferences for redistribution (1 – Income should be more equal for everybody, 5 – we need more income inequality to foster individual effort). Senegal is a dummy variable equal to 1 if the participant is from Senegal and 0 if they are from Guinea-Bissau. Disadvantageous inequality is a dummy variable equal to 1 if the individual is in the Disadvantageous inequality treatment and 0 otherwise. Advantageous inequality is a dummy variable equal to 1 if the individual is in the Advantageous inequality treatment and 0 otherwise. Senegal is a dummy variable equal to 1 if the participant is from Senegal and 0 if they are from Guinea-Bissau. Disadvantageous inequality is a dummy variable equal to 1 if the individual received the disadvantageous inequality treatment and 0 otherwise. Advantageous inequality is a dummy variable equal to 1 if the individual received the advantageous inequality treatment and 0 otherwise. Senegal*Dis inequality is the interaction term between Senegal and the treatment disadvantageous inequality. Senegal*Adv inequality is the interaction term between Senegal and advantageous inequality. Standard errors are clustered by session. All regressions have location controls. * significant at 10%; ** significant at 5%; *** significant at 1%

Figure B3 – Results of the Money-Burning game

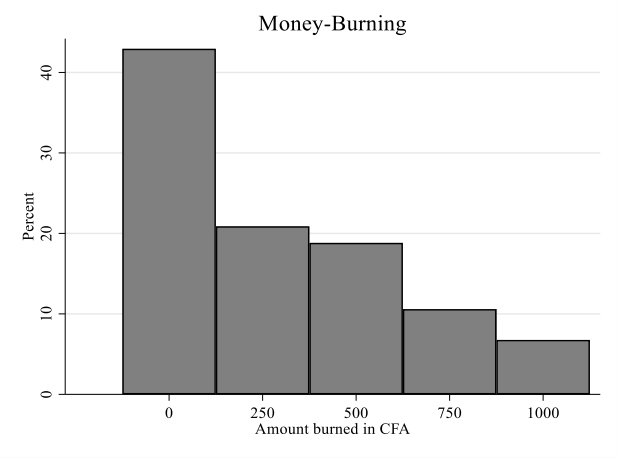
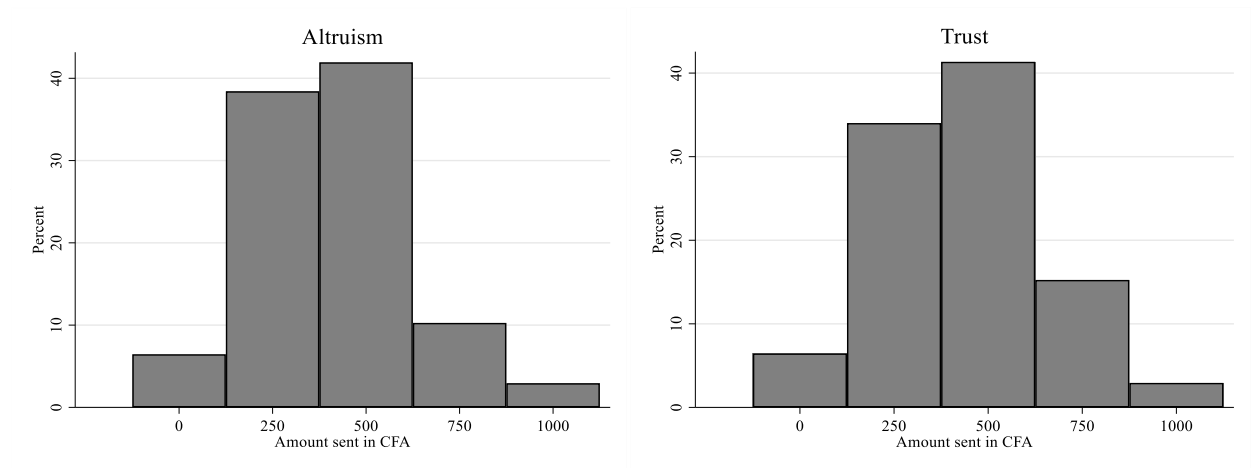


Figure B4– Results of the Dictator and Trust games



Appendix C

Table C1: SMS treatment groups

		Dissimilar group of peers			
		Control	Placebo	Neutral	Positive
Similar group of peers	Control	X			
	Placebo		X	X	X
	Neutral		X	X	X
	Positive		X	X	X

Table C2a : All messages sent by treatment group - preliminary

	Day 1 message 1	Day 1 message 2	Day1 message 3
Placebo /placebo	You were interviewed for a study concerning Mozambican politics in the last 3 weeks. As then mentioned, we would like to send you messages related to the elections of November 20.	You were interviewed for a study concerning Mozambican politics in the last 3 weeks. As then mentioned, we would like to send you messages related to the elections of November 20.	You were interviewed for a study concerning Mozambican politics in the last 3 weeks. As then mentioned, we would like to send you messages related to the elections of November 20.
Placebo /dissimilar- neutral	You were interviewed for a study concerning Mozambican politics in the last 3 weeks. As then mentioned, we would like to send you messages related to the elections of November 20.	A group of 2 other people that we interviewed in our study has been assigned to you. They will share with you information about the municipal elections of November 20.	The purpose of the messages sent by the people in your group is to give you information about the municipal elections, which might influence your own vote on November 20.
Placebo /dissimilar- positive	You were interviewed for a study concerning Mozambican politics in the last 3 weeks. As then mentioned, we would like to send you messages related to the elections of November 20.	A group of 2 other people that we interviewed in our study has been assigned to you. They will share with you whether they intend to vote on the municipal elections of November 20.	The purpose of the messages sent by the people in your group is to give you information about the municipal elections, which might influence your own vote on November 20.

Table C2b: All messages sent by treatment group - preliminary

	Day 1 message 1	Day 1 message 2	Day1 message 3
Similar-neutral/placebo	You were interviewed for a study concerning Mozambican politics in the last 3 weeks. As then mentioned, we would like to send you messages related to the elections of November 20.	A group of 2 other people that we interviewed in our study has been assigned to you. These individuals are similar to you. They will share with you information about the municipal elections of November 20.	The purpose of the messages sent by the people in your group is to give you information about the municipal elections, which might influence your own vote on November 20.
Similar-neutral/dissimilar-neutral	You were interviewed for a study concerning Mozambican politics in the last 3 weeks. As then mentioned, we would like to send you messages related to the elections of November 20.	A group of 4 other people that we interviewed in our study has been assigned to you. They will share with you information about the municipal elections of November 20.	The purpose of the messages sent by the people in your group is to give you information about the municipal elections, which might influence your own vote on November 20.
Similar-neutral/dissimilar-positive	You were interviewed for a study concerning Mozambican politics in the last 3 weeks. As then mentioned, we would like to send you messages related to the elections of November 20.	A group of 4 other people that we interviewed in our study has been assigned to you. Some of them will share with you whether they intend to vote on the municipal elections of November 20.	The purpose of the messages sent by the people in your group is to give you information about the municipal elections, which might influence your own vote on November 20.

Table C2c: All messages sent by treatment group - preliminary

	Day 1 message 1	Day 1 message 2	Day1 message 3
Similar-positive /placebo	You were interviewed for a study concerning Mozambican politics in the last 3 weeks. As then mentioned, we would like to send you messages related to the elections of November 20.	A group of 2 other people that we interviewed in our study has been assigned to you. These individuals are similar to you They will share with you whether they intend to vote on the municipal elections of November 20.	The purpose of the messages sent by the people in your group is to give you information about the municipal elections, which might influence your own vote on November 20.
Similar-positive /dissimilar-neutral	You were interviewed for a study concerning Mozambican politics in the last 3 weeks. As then mentioned, we would like to send you messages related to the elections of November 20.	A group of 4 other people that we interviewed in our study has been assigned to you. Some of them will share with you whether they intend to vote on the municipal elections of November 20.	The purpose of the messages sent by the people in your group is to give you information about the municipal elections, which might influence your own vote on November 20.
Similar-positive /dissimilar-positive	You were interviewed for a study concerning Mozambican politics in the last 3 weeks. As then mentioned, we would like to send you messages related to the elections of November 20.	A group of 4 other people that we interviewed in our study has been assigned to you. They will share with you whether they intend to vote on the municipal elections of November 20.	The purpose of the messages sent by the people in your group is to give you information about the municipal elections, which might influence your own vote on November 20.

Table C2d: All messages sent by treatment group - main

	Day 2-8 message 1	Day 2-8 message 2	Day 2-8 message 3	Day 2-8 message 4
Placebo /placebo	REMEMBER: Municipal elections are on November 20.	REMEMBER: Municipal elections are on November 20.	REMEMBER: Municipal elections are on November 20.	REMEMBER: Municipal elections are on November 20.
Placebo /dissimilar- neutral	REMEMBER: Municipal elections are on November 20.	REMEMBER: Municipal elections are on November 20.	My name is XX1 [first name, different gender implied], I am a participant [different gender] in the study on Mozambican politics, I am on my XX1s [different age group], and I would like to remind you that the municipal elections are on November 20.	My name is XX2 [first name, different gender implied], I am a participant [different gender] in the study on Mozambican politics, I am on my XX2s [different age group], and I would like to remind you that the municipal elections are on November 20.
Placebo /dissimilar- positive	REMEMBER: Municipal elections are on November 20.	REMEMBER: Municipal elections are on November 20.	My name is XX1 [first name, different gender implied], I am a participant [gender] in the study on Mozambican politics, I am on my XX1s [different age group], AND I WILL VOTE ON THE NEXT MUNICIPAL ELECTIONS ON NOVEMBER 20. I WOULD LIKE YOU TO VOTE AS WELL!’	My name is XX2 [first name, different gender implied], I am a participant [gender] in the study on Mozambican politics, I am on my XX2s [different age group], AND I WILL VOTE ON THE NEXT MUNICIPAL ELECTIONS ON NOVEMBER 20. I WOULD LIKE YOU TO VOTE AS WELL!’

Table C2e: All messages sent by treatment group - main

	Day 2-8 message 1	Day 2-8 message 2	Day 2-8 message 3	Day 2-8 message 4
Similar-neutral /placebo	My name is XX1 [first name, same gender implied], I am a participant [same gender] in the study on Mozambican politics, I am on my XX1s [same age group], and I would like to remind you that the municipal elections are on November 20.	My name is XX2 [first name, same gender implied], I am a participant [same gender] in the study on Mozambican politics, I am on my XX2s [same age group], and I would like to remind you that the municipal elections are on November 20.	REMEMBER: Municipal elections are on November 20.	REMEMBER: Municipal elections are on November 20.
Similar-neutral /dissimilar-neutral	My name is XX1 [first name, same gender implied], I am a participant [same gender] in the study on Mozambican politics, I am on my XX1s [same age group], and I would like to remind you that the municipal elections are on November 20.	My name is XX2 [first name, same gender implied], I am a participant [same gender] in the study on Mozambican politics, I am on my XX2s [same age group], and I would like to remind you that the municipal elections are on November 20.	My name is XX3 [first name, different gender implied], I am a participant [different gender] in the study on Mozambican politics, I am on my XX3s [different age group], and I would like to remind you that the municipal elections are on November 20.	My name is XX4 [first name, different gender implied], I am a participant [different gender] in the study on Mozambican politics, I am on my XX4s [different age group], and I would like to remind you that the municipal elections are on November 20.
Similar-neutral /dissimilar-positive	My name is XX1 [first name, same gender implied], I am a participant [same gender] in the study on Mozambican politics, I am on my XX1s [same age group], and I would like to remind you that the municipal elections are on November 20.	My name is XX2 [first name, same gender implied], I am a participant [same gender] in the study on Mozambican politics, I am on my XX2s [same age group], and I would like to remind you that the municipal elections are on November 20.	My name is XX3 [first name, different gender implied], I am a participant [different gender] in the study on Mozambican politics, I am on my XX3s [different age group], AND I WILL VOTE ON THE NEXT MUNICIPAL ELECTIONS ON NOVEMBER 20. I WOULD LIKE YOU TO VOTE AS WELL!’	My name is XX4 [first name, different gender implied], I am a participant [different gender] in the study on Mozambican politics, I am on my XX4s [different age group], AND I WILL VOTE ON THE NEXT MUNICIPAL ELECTIONS ON NOVEMBER 20. I WOULD LIKE YOU TO VOTE AS WELL!’

Table C2f: All messages sent by treatment group - main

	Day 2-8 message 1	Day 2-8 message 2	Day 2-8 message 3	Day 2-8 message 4
Similar-positive /placebo	My name is XX1 [first name, same gender implied], I am a participant [same gender] in the study on Mozambican politics, I am on my XX1s [same age group], AND I WILL VOTE ON THE NEXT MUNICIPAL ELECTIONS ON NOVEMBER 20. I WOULD LIKE YOU TO VOTE AS WELL!’	My name is XX1 [first name, same gender implied], I am a participant [same gender] in the study on Mozambican politics, I am on my XX1s [same age group], AND I WILL VOTE ON THE NEXT MUNICIPAL ELECTIONS ON NOVEMBER 20. I WOULD LIKE YOU TO VOTE AS WELL!’	REMEMBER: Municipal elections are on November 20.	REMEMBER: Municipal elections are on November 20.
Similar-positive /dissimilar-neutral	My name is XX1 [first name, same gender implied], I am a participant [same gender] in the study on Mozambican politics, I am on my XX1s [same age group], AND I WILL VOTE ON THE NEXT MUNICIPAL ELECTIONS ON NOVEMBER 20. I WOULD LIKE YOU TO VOTE AS WELL!’	My name is XX1 [first name, same gender implied], I am a participant [same gender] in the study on Mozambican politics, I am on my XX1s [same age group], AND I WILL VOTE ON THE NEXT MUNICIPAL ELECTIONS ON NOVEMBER 20. I WOULD LIKE YOU TO VOTE AS WELL!’	My name is XX3 [first name, different gender implied], I am a participant [different gender] in the study on Mozambican politics, I am on my XX3s [different age group], and I would like to remind you that the municipal elections are on November 20.	My name is XX4 [first name, different gender implied], I am a participant [different gender] in the study on Mozambican politics, I am on my XX4s [different age group], and I would like to remind you that the municipal elections are on November 20.
Similar-positive /dissimilar-positive	My name is XX1 [first name, same gender implied], I am a participant [same gender] in the study on Mozambican politics, I am on my XX1s [same age group], AND I WILL VOTE ON THE NEXT MUNICIPAL ELECTIONS ON NOVEMBER 20. I WOULD LIKE YOU TO VOTE AS WELL!’	My name is XX1 [first name, same gender implied], I am a participant [same gender] in the study on Mozambican politics, I am on my XX1s [same age group], AND I WILL VOTE ON THE NEXT MUNICIPAL ELECTIONS ON NOVEMBER 20. I WOULD LIKE YOU TO VOTE AS WELL!’	My name is XX3 [first name, different gender implied], I am a participant [different gender] in the study on Mozambican politics, I am on my XX3s [different age group], AND I WILL VOTE ON THE NEXT MUNICIPAL ELECTIONS ON NOVEMBER 20. I WOULD LIKE YOU TO VOTE AS WELL!’	My name is XX4 [first name, different gender implied], I am a participant [different gender] in the study on Mozambican politics, I am on my XX4s [different age group], AND I WILL VOTE ON THE NEXT MUNICIPAL ELECTIONS ON NOVEMBER 20. I WOULD LIKE YOU TO VOTE AS WELL!’

Note on deviations from the Pre-analysis plan

There are some secondary hypotheses and outcomes that we mentioned in the pre-analysis plan and that we do not include in the analysis of this paper. These are the following:

- We expected to include both targeted and untargeted subjects in all enumeration areas in terms of distribution of the newspaper, i.e., we planned a control group within treated enumeration areas. However, we faced implementation problems on this dimension of the design and decided to drop it. Hence, our hypothesis related to the comparison of targeted and untargeted survey respondents was not possible.
- Although we mention in the text of the paper that we randomized the distribution of the newspaper across two modalities, i.e., distribution by enumerators in the context of our baseline survey and by a group of fieldworkers associated with @Verdade, we do not show results comparing the two treatment arms. The differences are not significant, in accordance with our hypotheses. Since we found this result to be of secondary importance, we left it out of the paper analysis.
- The hypothesis that the distribution of the newspaper increased voter confidence in their ability to assess candidates was mostly related to the initial focus of this project on political accountability associated to the proposals of electoral candidates. In face of the conflict situation in the pre-election period and the lower prominence of campaign proposals in the contents of the newspaper, we decided to drop this from the analysis of the paper.
- Interaction effects of newspaper and peer messages were proposed to be analyzed separately for reminders and encouragements. In order to simplify the analysis shown in the paper and in light of our lower emphasis on the separate results per strength of SMS treatments, we show in the paper the results blending both types of messages compared to the placebo ones.

Figure C1: Hotline leaflets

MELHORAMOS AS ELEIÇÕES MUNICIPAIS!

REPORTAR PROBLEMAS DURANTE A CAMPANHA ELEITORAL



ENVIAR MENSAGENS SMS FORMATO

HOTLINE *espaço* LOCAL *espaço* PROBLEMA

POR EXEMPLO

“Hotline EPC Quelimane Distúrbios no Comício”

PARA

90440

APOIO







MELHORAMOS AS ELEIÇÕES MUNICIPAIS!

REPORTAR PROBLEMAS DURANTE O DIA DAS ELEIÇÕES



ENVIAR MENSAGENS SMS FORMATO

HOTLINE *espaço* LOCAL *espaço* PROBLEMA

POR EXEMPLO

“Hotline EPC Quelimane Estação de Voto mudou”

PARA

90440

APOIO







Note: The translation of the text in the leaflet is as follows: We improve the municipal elections! Report issues during the Electoral Campaign/Election Day. Send text messages using the format: Hotline space Location space Problem. For example: ‘Hotline EPC Quelimane disturbance at the rally/change of polling station.’ For 9440.

Figure C2: Open letter leaflets

CARTA ABERTA

AO NOVO PRESIDENTE DO MUNICÍPIO!

DIGA AO PRESIDENTE DO MUNICÍPIO O QUE DEVE SER FEITO NO PAÍS DURANTE
O NOVO MANDATO

NÓS COMPROMETEMO-NOS A FAZER-LHE CHEGAR A CARTA EM MÃO!



ENVIE MENSAGENS SMS FORMATO

CARTA ABERTA espaço LOCAL espaço O-QUE-FAZER

POREXEMPLO

“Carta Aberta EPC Quelimane Estradas”

PARA

90440

ATÉ

31 DE DEZEMBRO DE 2013

APOIO



CARTA ABERTA

AO NOVO PRESIDENTE DO MUNICÍPIO!

DIGA AO PRESIDENTE DO MUNICÍPIO O QUE DEVE SER FEITO NO PAÍS DURANTE
O NOVO MANDATO

NÓS COMPROMETEMO-NOS A FAZER-LHE CHEGAR A CARTA EM MÃO!



ENVIE MENSAGENS SMS FORMATO

CARTA ABERTA espaço LOCAL espaço O-QUE-FAZER

POREXEMPLO

“Carta Aberta EPC Quelimane Escolas”

PARA

90440

ATÉ

31 DE DEZEMBRO DE 2013

APOIO



Note: The translation of the text in the leaflet is as follows: Open Letter to the new president of the municipality! Tell the president-elect of the municipality what should be done in the country during the new mandate. We commit to delivering the letter in hand! Send text messages using the format: Open Letter space Location space What-To-Do. For example: ‘Open Letter EPC Quelimane roads/schools.’ For 9440, until 31st of December, 2013.

Table C3a: Individual characteristics - baseline difference across treatment dimensions

	Newspaper @Verdade		Text messages							F-stat p-value
	Control	Newspaper	Control	Similar group of peers			Dissimilar group of peers			
				Placebo	Neutral	Positive	Placebo	Neutral	Positive	
Male	0.513	-0.011 (0.008)	0.477	0.009 (0.051)	0.019 (0.053)	0.054 (0.052)	0.01 (0.052)	0.019 (0.050)	0.053 (0.053)	0.311
Age	33.994	-1.161 (0.850)	32	0.662 (1.293)	1.591 (1.333)	2.058 (1.476)	1.702 (1.365)	2.035 (1.454)	0.582 (1.302)	0.358
Household size	5.847	-0.345 (0.238)	5.578	-0.194 (0.316)	-0.043 (0.361)	0.407 (0.345)	0.086 (0.327)	-0.012 (0.330)	0.094 (0.373)	0.108
Single	0.419	0.031 (0.037)	0.454	-0.023 (0.045)	-0.042 (0.047)	-0.024 (0.048)	-0.051 (0.048)	-0.028 (0.045)	-0.01 (0.045)	0.840
Union or married	0.525	-0.005 (0.035)	0.492	0.032 (0.048)	0.065 (0.049)	0.042 (0.050)	0.059 (0.050)	0.053 (0.047)	0.027 (0.047)	0.835
No education	0.072	-0.003 (0.018)	0.046	0.019 (0.021)	0.02 (0.021)	0.006 (0.023)	0.026 (0.023)	-0.002 (0.020)	0.021 (0.022)	0.556
Primary frequency	0.308	-0.072** (0.031)	0.262	0.02 (0.045)	-0.029 (0.043)	0.001 (0.044)	-0.003 (0.043)	0.034 (0.046)	-0.038 (0.045)	0.025
Primary schooling	0.412	0.035 (0.030)	0.485	-0.083 (0.054)	-0.017 (0.052)	-0.039 (0.050)	-0.067 (0.053)	-0.038 (0.051)	-0.033 (0.053)	0.402
No religion	0.064	-0.011 (0.020)	0.063	0.003 (0.023)	0.012 (0.020)	-0.01 (0.024)	0.01 (0.022)	0.005 (0.024)	-0.01 (0.023)	0.604
Catholic	0.324	-0.012 (0.039)	0.313	0.007 (0.046)	-0.011 (0.046)	0.053 (0.045)	0.006 (0.047)	0.01 (0.047)	0.033 (0.044)	0.407
Muslim	0.275	0.048 (0.053)	0.266	-0.006 (0.038)	0.01 (0.037)	-0.023 (0.037)	0.006 (0.036)	-0.011 (0.038)	-0.014 (0.037)	0.873
Macua	0.318	0.066 (0.068)	0.325	-0.017 (0.029)	-0.016 (0.030)	-0.035 (0.035)	-0.025 (0.030)	-0.018 (0.033)	-0.025 (0.030)	0.912
Changana	0.202	-0.032 (0.047)	0.198	-0.004 (0.036)	-0.013 (0.033)	-0.014 (0.033)	-0.007 (0.032)	-0.003 (0.035)	-0.021 (0.034)	0.963

Note: Standard errors of the differences to corresponding control groups reported in parenthesis. The last column displays the p-value of an F-test of joint significance resulting from a regression on dummy variables for each of the treatment groups included in the table. *significant at 10%; **significant at 5%; ***significant at 1%

Table C3b: Individual characteristics - baseline difference across treatment dimensions

	Newspaper @Verdade		Text messages							F-stat p-value
	Control	Newspaper	Control	Similar group of peers			Dissimilar group of peers			
				Placebo	Neutral	Positive	Placebo	Neutral	Positive	
No occupation	0.131	0.024 (0.029)	0.197	-0.06 (0.040)	-0.05 (0.040)	-0.056 (0.037)	-0.059 (0.038)	-0.054 (0.040)	-0.054 (0.039)	0.749
Farmer	0.236	-0.029 (0.039)	0.165	0.054 (0.036)	0,057* (0.034)	0.049 (0.038)	0.018 (0.033)	0,092** (0.038)	0.05 (0.036)	0.115
Artisan	0.046	0.022* (0.012)	0.094	-0.028 (0.029)	-0.032 (0.030)	-0.038 (0.028)	-0.041 (0.029)	-0.033 (0.029)	-0.022 (0.029)	0.184
Household work	0.137	-0.008 (0.021)	0.118	0.013 (0.032)	0.01 (0.034)	0.012 (0.034)	0.02 (0.033)	0.017 (0.033)	-0.002 (0.034)	0.961
Has book	0.625	0.016 (0.038)	0.669	-0.033 (0.048)	0.003 (0.047)	-0.017 (0.046)	-0.02 (0.047)	-0.002 (0.047)	-0.025 (0.046)	0.725
Has radio	0.675	-0.016 (0.029)	0.69	-0.058 (0.046)	-0.002 (0.052)	0.007 (0.046)	-0.013 (0.047)	-0.022 (0.048)	-0.018 (0.049)	0.631
Has bike	0.258	0.021 (0.039)	0.325	-0.063 (0.045)	-0,087** (0.043)	-0.03 (0.046)	-0,086** (0.043)	-0.066 (0.047)	0.027 (0.045)	0.132
Has house	0.811	0.019 (0.028)	0.802	0.001 (0.038)	0.047 (0.039)	0.026 (0.040)	0.017 (0.042)	0.031 (0.038)	0.025 (0.036)	0.641
Has land	0.74	-0.034 (0.035)	0.706	0.005 (0.043)	0,000 (0.045)	0.027 (0.045)	0.021 (0.045)	-0.004 (0.045)	0.017 (0.043)	0.784
Has animal	0.269	-0.023 (0.034)	0.278	0.021 (0.045)	-0.033 (0.047)	-0.011 (0.044)	-0.025 (0.046)	-0.019 (0.044)	0.021 (0.046)	0.478
Has fridge	0.334	-0.023 (0.044)	0.341	-0.008 (0.048)	0.003 (0.044)	0.015 (0.046)	0.022 (0.045)	-0.017 (0.046)	0.004 (0.048)	0.892
Has mobile phone	0.933	-0.004 (0.021)	0.961	-0.027 (0.021)	-0.008 (0.018)	-0.013 (0.020)	-0.008 (0.019)	-0,042* (0.023)	0.003 (0.017)	0.118

Note: Standard errors of the differences to corresponding control groups reported in parenthesis. The last column displays the p-value of an F-test of joint significance resulting from a regression on dummy variables for each of the treatment groups included in the table. *significant at 10%; **significant at 5%;

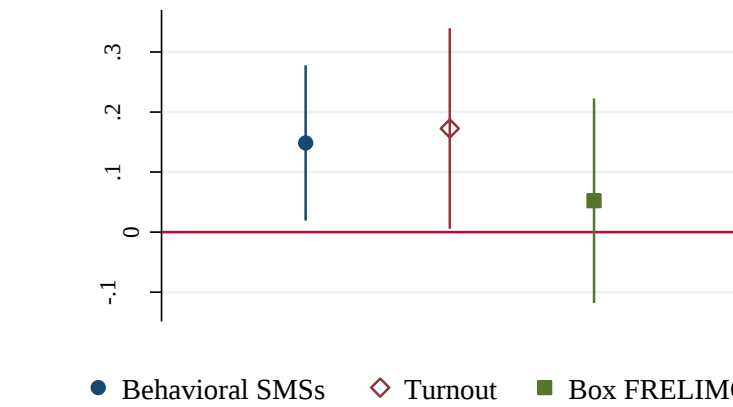
***significant at 1%

Table C3c: Individual characteristics - baseline difference across treatment dimensions

	Newspaper @Verdade		Text messages							F-stat p-value
	Control	Newspaper	Control	Similar group of peers			Dissimilar group of peers			
				Placebo	Neutral	Positive	Placebo	Neutral	Positive	
Turnout 2009	0.902	0.016 (0.021)	0.896	0.019 (0.039)	0.020 (0.040)	0.010 (0.039)	0.024 (0.039)	0.013 (0.041)	0.013 (0.040)	0.980
FRELIMO NA 2009	0.934	0.012 (0.017)	0.925	0.024 (0.034)	-0.002 (0.036)	0.011 (0.037)	0.017 (0.035)	0.007 (0.034)	0.007 (0.037)	0.883
MDM NA 2009	0.045	-0.015 (0.013)	0.041	-0.008 (0.028)	-0.015 (0.028)	-0.006 (0.028)	-0.018 (0.028)	-0.003 (0.028)	-0.009 (0.029)	0.948
RENAMO NA 2009	0.022	-0.003 (0.010)	0.030	-0.016 (0.023)	0.000 (0.024)	-0.008 (0.023)	-0.003 (0.024)	-0.013 (0.023)	-0.007 (0.023)	0.891
FRELIMO PR 2009	0.930	0.018 (0.018)	0.939	-0.004 (0.034)	-0.018 (0.033)	0.005 (0.034)	-0.015 (0.033)	-0.003 (0.032)	0.001 (0.034)	0.964
MDM PR 2009	0.048	-0.020 (0.014)	0.045	-0.009 (0.030)	-0.006 (0.029)	-0.007 (0.029)	-0.010 (0.029)	0.001 (0.030)	-0.013 (0.029)	0.941
RENAMO PR 2009	0.019	-0.003 (0.009)	0.015	-0.006 (0.017)	0.015 (0.019)	0.002 (0.017)	0.007 (0.018)	-0.002 (0.017)	0.008 (0.018)	0.661

Note: Standard errors of the differences to corresponding control groups reported in parenthesis. Turnout is measured as the number of voters who reported to have voted divided by the number of registered voters. NA - National Assembly; PR - President of the Republic. A vote share is measured as the number of votes for a party/candidate divided by total number of votes. The last column displays the p-value of an F-test of joint significance resulting from a regression on dummy variables for each of the treatment groups included in the table. *significant at 10%; **significant at 5%; ***significant at 1%

Figure C3: Aggregated effects of any SMS treatment on political behavior



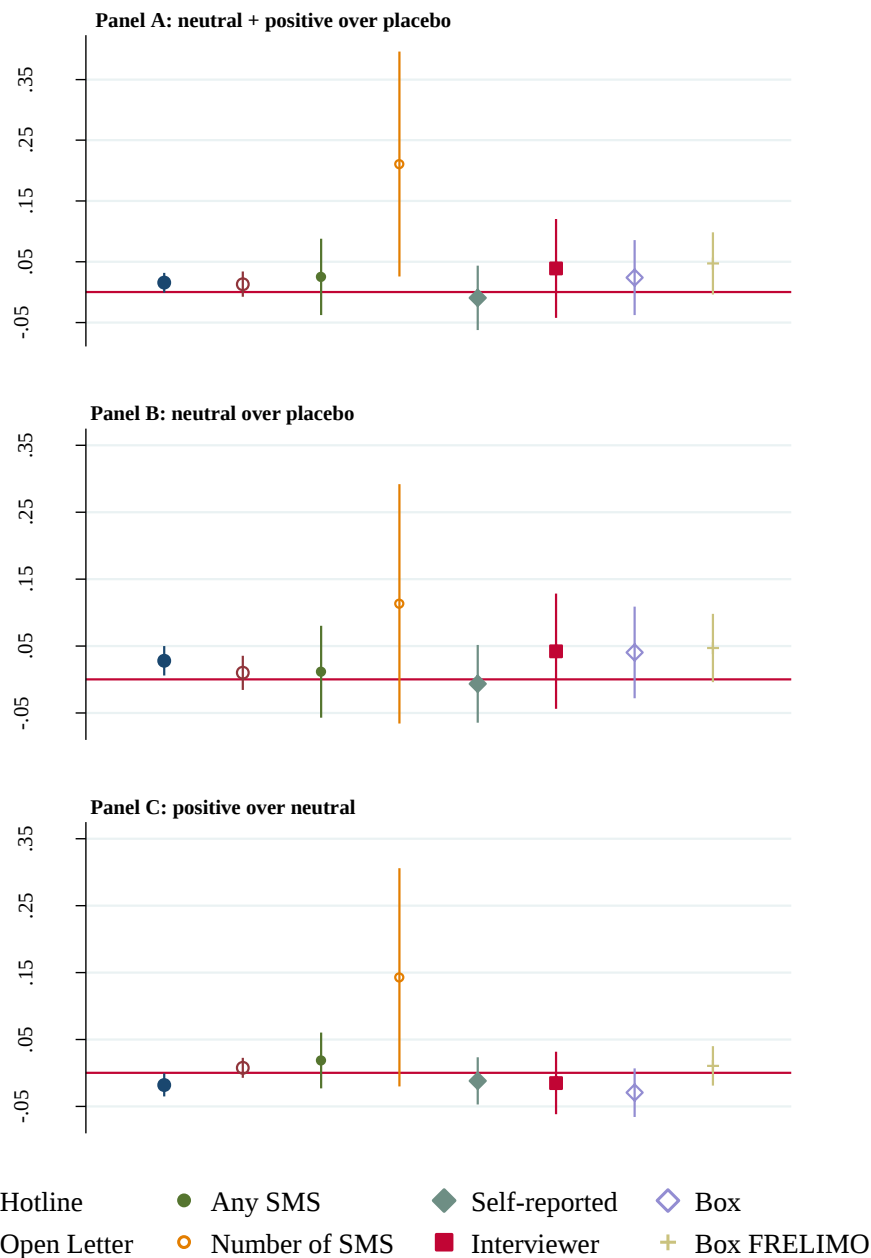
Note: Treatment effects of receiving any SMS treatment, estimated using OLS. Outcome variables are standardized. In the case of indices, we follow the method in Kling et al. (2007), which aggregates index components with equal weights. Behavioral SMSs corresponds to an index of Hotline, Open Letter, Any SMS, and Number of SMS. Turnout corresponds to an index of Self-reported, Interviewer, and Box. All regressions include province dummies and controls. Controls are: gender, age, household size, education, and employment status. Clustered standard errors by enumeration are employed. 90% confidence intervals.

Table C4: Differences between each SMS treatment and the control group on political behavior

	Behavior	Electoral outcomes	
		Turnout	Voting
Placebo/placebo	0	0	0
Placebo/dissimilar-neutral	" + "	0	0
Placebo/dissimilar-positive	" - " & " + "	" + "	0
Similar-neutral/placebo	0	" + "	0
Similar-neutral/dissimilar-neutral	" + "	0	0
Similar-neutral/dissimilar-positive	" + "	0	0
Similar-positive/placebo	" + "	0	0
Similar-positive/dissimilar-neutral	" + "	" + "	0
Similar-positive/dissimilar-positive	" + "	" + "	0

Note: OLS regressions. Outcome sets: i) behavior: hotline, open letter, any sms, number of sms; ii) turnout: self-reported, interviewer, box; and iii) voting: box frelimo. Each entry depicts the sign of the treatment effect when comparing a specific SMS treatment with the control groups, as follows. Individual statistical significance concerns clustered standard errors by enumeration area and is set at the 10 percent level. 0: no significant effect on any outcome within the set. "+" positive significant effect in at least one component of the outcome set. "-" negative significant effect in at least one component of the outcome set. All specifications include province dummies and controls. Controls are: gender, age, household size, education, and employment status.

Figure C4: Effects of strength of SMS treatments on political behavior



Note: Treatment effects estimated using OLS. They are defined as receiving an SMS treatment from a peer group (neutral and/or positive). Neither panel includes the SMS control group. Panel B does not include subjects who received positive messages. Panel C does not include subjects who received placebo messages. All dependent variables are binary, except number of SMS. All regressions include province dummies and controls. Controls are: gender, age, household size, education, and employment status. Clustered standard errors by enumeration are employed. 90% confidence intervals.