Trust and Accountability in Times of Polarization*

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Abstract

The COVID-19 pandemic took place against the backdrop of growing political polarization and distrust in political institutions in many countries. Did deficiencies in government performance further erode trust in public institutions? Did citizens' ideology interfere with the way they processed information on their government performance? To investigate both questions, we conducted a pre-registered online experiment in Spain in November 2020. Respondents in the treatment group were provided information on the number of contact tracers in their region, a key policy under the control of regional governments. We find that individuals greatly over-estimate the number of contact tracers in their region. When we provide the actual number of contact tracers, we find: a decline in trust in governments; a reduction on willingness to fund public institutions; and a decrease in COVID-19 vaccine acceptance. We also find that individuals endogenously change their attribution of responsibilities when receiving the treatment. In regions where the regional and central governments are ruled by different parties, sympathizers of the regional incumbent react to the negative news on performance by attributing greater responsibility for it to the central government. We call this the *blame shifting effect*. In those regions, the negative information does not translate into lower voting intentions for the regional incumbent government. These results suggest that the exercise of political accountability may be particularly difficult in settings with high political polarization and where areas of responsibility are not clearly delineated.

Keywords: trust, accountability, polarization, COVID-19

JEL codes: P00, D72, H1, H7

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1 Introduction

Several scholars have argued that individuals' trust in political institutions and willingness to cooperate with the state are cornerstone characteristics of well-functioning democracies (Levi (1989), Acemoglu et al. (2020)). Citizens' cooperation in terms of tax compliance, voter turnout, and abiding by regulations are understood as key components of effective governments. Trust and cooperation with the state is even more important during times of crises, as the recent COVID-19 pandemic has shown. Compliance with government directives such as social distancing and vaccinations was key in the fight against the virus during the initial stages of the pandemic (Besley and Dray (2022)).

Unfortunately, the pandemic took place at a time when trust in political institutions was at a low point. In the last decades, many countries have experienced declines in trust in political institutions and increases in support for populist or anti-establishment parties (Dustmann et al. (2017), Guriev and Papaioannou (2020)). Furthermore, recent studies have indicated that political trust has further eroded during the pandemic[1] and has led to unrest in some countries (The Economist (2021)). While the reasons behind growing discontent are diverse, some accounts attribute these trends to the citizens' disappointment with the performance of governments in the management of the pandemic and its economic consequences. In the early stages of the pandemic, the frequent change in directives—regarding the modes of virus transmission and the adequacy of masking, for instance—raised doubts of whether governments had the situation under control. As the pandemic evolved, there were increasing concerns that some governments had not exerted enough efforts in developing systems to control the pandemic.[2]

In this paper, we study two main questions. First, did deficiencies in government performance further erode trust in public institutions? In contexts with low underlying confidence in political institutions, negative news about government performance may have led to further distrust in government. The evaluation of governments may not have been circumscribed to changing opinions about the incumbent, but may have affected deeper attitudes towards the political system. Whether and how the policy response to the COVID-19 pandemic affected confidence in the political system has received only limited attention. Examining this question is important since low levels of trust and willingness to cooperate with the state also make the

[1] See, for instance, Davies et al. (2021) for the UK and Hamel et al. (2020) for the US. Note that some countries experienced short-lived increases in trust at the onset of the pandemic. This was likely driven by "rally around the flag" effects. See, for instance, Amat et al. (2020). However, studies that traced the evolution of trust for longer periods of time documented subsequent declines as the pandemic evolved (Davies et al. (2021), Becher et al. (2021)). See also Fisman et al. (2021) for how mounting discontent sometimes leads to policy responses.

[2] Ben Smith (2020). "How Zeynep Tufekci Keeps Getting the Big Things Right." *The New York Times*, August 23. Retrieved on May 24, 2022; Davies et al. (2021).

management of the pandemic more difficult, hence opening the posibility of a negative feedback loop between trust and government effectiveness.[3]

Second, did citizens' ideology interfere with the way they processed information on their government's performance? And, what implications did this have for the exercise of political accountability? Standard models of accountability predict that voters will lower their support for the incumbent when (s)he under performs. However, this result builds on the critical assumption that voters accurately attribute the responsibility to the relevant political actor (Besley (2007)). In contexts of high political polarization, individuals may change their beliefs about areas of responsibility once they confront negative information about the performance of an incumbent they are ideologically aligned to.

To address these questions, we conducted an online survey and pre-registered experiment during the early stages of the pandemic where we provide individuals information about the performance of their governments in developing systems to control the spread of the COVID-19 virus in their region.[4] We focus on the context of Spain, which was one of the countries with the highest COVID-19 mortality rates during the first months of the pandemic[5] and where discontent with the state had been mounting in the years preceding the pandemic.[6]

Obtaining measures of government performance in the management of the pandemic is difficult for two main reasons. First, the virus propagated in unexpected ways.[7] Hence, measures based on COVID-19 incidence may be a misleading indicator of government efforts in containing the virus. Second, individuals oftentimes had conflicting policy preferences regarding policies that reduced contagion but that also negatively affected economic activity, such as lockdowns. In this paper, we focus on one policy that had broad support among the Spanish population and that was effective in reducing COVID-19 transmission without large costs to economic activity: investments in contact tracing systems. Since the beginning of the pandemic, the World Health Organization recommended investing in trace and testing systems to control the pandemic (World Health Organization (2020)). These systems typically comprise a team of public sector employees that reach out to individuals infected with COVID-19, gather their recent contacts, and reach out to those contacts to recommend them to get tested. There

[3] Acemoglu et al. (2020) present a similar argument in the context of Pakistan. Deficiencies in public services reduce individuals' willingness to cooperate with the state, which makes it more difficult for the state to deliver public goods effectively. See also Acemoglu's intervention in "Trust in institutions" online talk.

[4] The experiment was pre-registered in the AEA registry (AEARCTR-0006889) and subject to the evaluation of the Ethics Committee at CEMFI (Application Reference #9; Approval date: October 2020).

[5] By June 2020 Spain was the third country (among large ones) in terms of COVID-19 deaths per capita.

[6] Martín Caparrós (2019) "Vox and the Rise of the Extreme Right in Spain", *New York Times*, November 13. Retrieved on August 18, 2022.

[7] Leonhardt David (2021). "The Covid Fable." *The New York Times*, October 8. Retrieved on May 24, 2022.

is evidence that these systems were highly effective at reducing virus transmission and deaths during the early stages of the pandemic (Fetzer and Graeber (2021)).[8]

Our treatment consists of providing information on the actual number of contact tracers in the respondent's region, together with information on the number of tracers that would be necessary to trace all cases. We estimated the latter using the International Contact Tracing Workforce Estimator, which is a tool developed by the US Health Department to assist governments throughout the world to predict the hiring needs for their contact tracing systems. We interpret the discrepancy between the *necessary* number of tracers and the actual number of tracers as a measure of low quality in the management of the pandemic. Given the effectiveness of contact tracing in reducing virus transmission and the limited cost when compared to the economic cost of tighter restrictions, we find this interpretation plausible.

We also use an important feature of the Spanish political system to investigate our second question of interest: how do individuals attribute responsibility when receiving news about the quality of the management of a key public service. In Spain, health policies are a responsibility of regional governments (a.k.a. autonomous communities). These responsibilities comprise the development of contact tracing systems among other COVID-19 related policies. However, during the pandemic, the central government also took policy decisions to manage the pandemic, such as deploying military personnel to support contact tracing services. Hence, it is possible that citizens perceived some uncertainty regarding areas of responsibility. We use this feature to investigate whether individuals' political leanings affect how they attribute responsibilities and the consequences of this for the exercise of political accountability.

Our online survey was fielded in November 2020 to a representative sample of the Spanish population. About 3,705 individuals completed the questionnaire. The main part of our survey consists of the realization of a survey experiment. We randomly assigned half of respondents to receive information on the number of contact tracers per capita in their region. We further provide them with the information on the "deficit" of tracers in their region (i.e., the difference between necessary number of tracers to trace all cases and the actual number of tracers in their region). This information is provided using a colored slider (using red, orange, green) indicating different degrees of performance. Hence, aside from the numerical values, the treatment conveyed a qualitative measure of quality of the system. We then proceed to collect our main outcomes of interest: assessment of competence of different levels of government, trust in

[8] Fetzer and Graeber (2021) exploit a glitch in the UK contact tracing system that left some cases untraced. They estimate that each case left untraced was associated with 18.6 additional infections and 0.24 deaths. At the time this happened, the level of COVID-19 in the UK was similar to the incidence in Spain in November 2020. Hence, it is likely that contact tracing systems were still effective for virus contagion in the Spain.

political institutions, attribution of responsibilities, and voting intentions.

First, we investigate whether individuals have accurate information about the number of contact tracers in their region. We find that 85% of individuals over-estimate the number of contact tracers in their region. Furthermore, about one third of respondents over-estimate the number of tracer by more than one standard deviation. This indicates that individuals have very imperfect information about the quality of a key policy in the management of the COVID-19 pandemic.

Second, we examine the effects of the provision of this information on the individuals' assessment of the level of competence of different levels of government. We understand these results as a conceptual *first stage*: if our treatment has effects on trust and other outcomes, it probably also affected respondents' beliefs about the level of competence of governments. We hypothesize that the treatment effects on competence assessment will be negative, since most individuals over-estimated the number of tracers prior to the treatment. Consistent with that expectation, we find that the treatment reduces the perceived competence of the regional and central government by around 1 and 0.6 points (on a 0-10 scale), respectively, which represent declines of 21% and 15% over the sample mean.

Next, we examine the effects of trust on political institutions. Our objective is to assess whether the negative news about the management of the pandemic affects individuals' fundamental attitudes, such as trust in political institutions. We measure political trust in different ways. First, we elicit confidence in different institutions on a 0 to 10 scale—as is common in the literature. Second, we measure trust using a modified dictator game in which respondents donate funds to different institutions or to an NGO. Our results indicate that the negative news about the management of the pandemic lowered trust in the regional and central government by 7%. Willingness to contribute to these governments also significantly declines.

We also examine the effects on vaccine hesitancy. By the time our survey was conducted in November 2020, no COVID-19 vaccine had been approved by the European Medicines Agency. Hence, we asked individuals whether they would take a COVID-19 vaccine if recommended by their regional or central government. Given the setting and the formulation of the question, we interpret this question as capturing willingness to follow the advice of their governments, which could be understood as an expression of trust in that institution. Our results show that individuals that receive negative information regarding the quality of the management of the pandemic reduce their willingness to accept the COVID-19 vaccine. These results support the idea that there may be a negative feedback loop between trust in institutions and government effectiveness: worse assessments of government performance can decimate trust and compliance with

vaccination, which in turn makes the management of the pandemic more difficult.

Next, we examine whether political leanings affects how individuals attribute responsibilities for the negative information on performance. The recent literature in political economy suggests that factors such as polarization and identity politics affect how individuals attribute responsibility of outcomes to political parties and officials (Bonomi et al. (2021), Boxell et al. (2020)). Spain is indeed one of the most polarized countries among advanced economies Gidron et al. (2020). To study this, we treat the attribution of responsibility as an outcome variable. In particular, we ask individuals to choose a number between -10 and 10 where -10 (10) means that all responsibility in the management of the pandemic lies on the central (regional) government. We find that individuals politically aligned to the regional incumbent shift responsibility to the central government upon receiving negative news about the number of contact tracers in their region. We call this result the *"blame shifting"* effect: in the presence of negative news about government performance, individuals tend to shift the blame towards the level of government that they are less aligned with. Interestingly, this effect is not present for individuals that are sympathizers of the party of the central government or in regions where both the center and the regional government are ruled by the same party. It is likely that, in those settings, there was less scope for shifting the blame to the central government.

This behavior has important implications for the exercise of political accountability. In an extreme scenario, blame shifting may lead to individuals not punishing incumbent politicians for a deficient performance.[9] We provide evidence consistent with some of these predictions: in regions where the two levels of government are ruled by different parties (and hence there is scope for blame shifting), the treatment does not reduce the electoral support for the regional incumbent. In contrast, in regions where the two governments are ruled by the same party, our treatment leads to a decline in the propensity to vote for the incumbent governments. These results suggest that accountability may be more difficult in times of polarization and in federal systems with divided governments.

We conduct a number of robustness checks and tests for alternative interpretations of our results. For instance, we show that the treatment did not affect trust in economists or life satisfaction of respondents. This mitigates the concern that the results may be affected by experimental demand effects or by inducing a pessimistic mental state in respondents. Finally, some of our results are hard to explain on the basis of experimental demand effects. For instance, the heterogenous effects on attribution of responsibility across political alignment, or the differential

[9]Implicit in this argument is the assumption that the voters politically aligned to the regional government—which are the ones shifting the blame to the central government—are the majority in their region. This is a natural assumption since the regional incumbent, by definition, earned the support of most voters in the previous election.

treatment effects on the relative-performance treatment.

Our paper relates to severals strands of the literature. First, we contribute to the literature that has examined the effects of information about government performance on accountability (Besley and Burgess (2002), Ferraz and Finan (2008), Kendall et al. (2015), Arias et al. (2022), Dunning et al. (2019)). We follow recent papers in this literature by adopting an experimental approach that generates exogenous variation in exposure to information. However, we differ from this literature regarding our main outcome of interest. While this literature has mainly focused on support for the incumbent political representative or government, our objective is to evaluate the effects on broader political attitudes, in particular, trust in political institutions. Whether deficient government performance erodes these deeper expressions of confidence in the political system has received limited attention in the literature, and can be informative to understand trends in support for populist or anti-establishment parties (Guriev and Papaioannou (2020)). There are also several studies that suggest that the COVID-19 pandemic may affected individuals' fundamental political values (Alsan et al. (2021), Becher et al. (2021)).

Our paper is most closely related to Acemoglu et al. (2020), which studies how positive information about the performance of the judicial system in Pakistan affects individuals trust and willingness to engage with the state vis a vis non-state actors. We examine a related question in a very different context: that of the COVID-19 pandemic. Our paper is also related to Becher et al. (2021), which conducts a number of survey experiments providing information on the evolution of the pandemic and experimentally varying whether government action was positively or negatively framed.[10] They find that positive information treatments increased approval of governments. Using an instrumental variable approach, they also find that increases in government approval positively impact support for democracy. We differ from this study by providing information on a more specific but high stakes policy that is closely connected to policy action and by directly examining the effects on political trust. We also differ from both Acemoglu et al. (2020) and Becher et al. (2021) by examining attribution of responsibility as an endogenous outcome and investigating its consequences on political accountability.[11]

Second, a number of papers have studied the determinants of compliance with government directives in the context of the COVID-19 pandemic. For instance, Allcott et al. (2020), Besley and Dray (2022) study the role of political identity and demographics, Durante et al. (2021),

[10]More specifically, individuals received one information treatment related to the economy and another one related to health. These treatments combine information on COVID-19 cases, compared outcomes to previous pandemics, previous economic crises, and other countries.

[11]See also Khan et al. (2021) for a study in which positive information about government performance did not lead to increases in trust in the State. Eichengreen et al. (2020) study how exposure to historical pandemics during the impressionable ages negatively affected trust in government.

Goldstein and Wiedemann (2021) examine the effects of generalized trust, and Bargain and Aminjonov (2020) and Algan et al. (2021) show that countries with higher trust in political institutions and scientists exhibit greater rates of compliance. We differ from these studies by examining the "other side of the coin": whether quality of government performance in the management of the pandemic could explain trust in institutions and compliance with government recommendations.

Third, we contribute to the literature that has studied endogenous attribution of responsibilities in democracies. A number of studies in political science have provided correlations between partisanship and attribution of responsibilities to governments.[12] Some studies have used an experimental design (Tilley and Hobolt (2011), Rico and Liñeira (2018), León and Orriols (2019)). In addition to the focus on trust in political institutions, we differ from these studies in other respects. First, we examine in the same framework attribution of responsibility and voting intentions. This allows us to study the implications of blame-shifting for political accountability, which have not been studied jointly in previous papers. Second, our information treatment provides accurate information about a specific policy rather than general statements about a positive or negative evolution or the economy or public goods. Third, we focus on the unique case of the COVID-19 pandemic. Given the growing trends in political polarization of the last decades (Boxell et al. (2020)), shedding further light on how partisan identities affect attribution of responsibility for poor government performance seems a first order question.[13]

Finally, the paper relates to the emerging literature that uses online surveys to shed light on how individuals form beliefs and attitudes towards policies and governments. Some examples are Kuziemko et al. (2015), Amat et al. (2020), Alsan et al. (2021), Haaland et al. (2021), Bursztyn et al. (2022).

To sum up, to the best of our knowledge, our study is the first to study whether the quality of the management of the COVID-19 pandemic —measured using a direct proxy of government performance—affected trust in political institutions. We are also the first to study how individuals' partisan identities mediated in this process by affecting how individuals attribute responsibility for the deficient government performance in the management of the COVID-19 pandemic.

[12] See, for instance, Bisgaard (2015) in the context of the Great Recession in the UK. Related studies have also studied accountability in decentralized systems. Using aggregate data on vote shares and economic performance, some studies show that federal systems exhibit a weaker association between poor economic outcomes and re-election rates. See, for instance, Powell Jr and Whitten (1993), Anderson (2006), León et al. (2018), and León (2018).

[13] Along this lines, there are interesting studies testing interventions to depolarize individuals' attitudes and examining its effects on political accountability (Enriquez et al. (2022)).

The rest of the paper proceeds as follows. Section 2 provides information on the context. Section 3 describes the data and experimental design. Section 4 presents the results and robustness checks. Section 5 concludes.

2 Background and Context

2.1 The COVID-19 Pandemic in Spain

The World Health Organization declared COVID-19 a world-wide pandemic on March 11, 2020 (Cucinotta and Vanelli (2020)). Spain was one of the countries most severely affected by COVID-19 during the initial stages of the pandemic. By June 2020 it was the third country (among large ones) in terms of COVID-19 deaths per capita.[14] The Spanish government declared the state of alarm in March 14th and it entailed one of the strictest lockdowns in Europe. For almost two months the population was not allowed to leave their homes except for buying necessities or getting to work. As a result of the very strict restrictions, cases and deaths plummeted and COVID-19 incidence was low during the summer of 2020. Restrictions were progressively lifted entering in a phase labeled as "new normality". The main narrative at that time was that the strict lockdown provided governments with enough time to develop strategies to contain the virus, which was pursued as an explicit policy objective. A key component of the containment strategies was the development of contact tracing systems. We provide more details about these systems in the next subsection.

As restrictions relaxed, cases and deaths started building up again. In October 25, 2020 the government re-instated a state of alarm and stricter measures were imposed. In particular, mobility restrictions, a curfew, and limits on the number attendants to social gatherings were reintroduced. This led to a generalized feeling of disappointment since most individuals were not expecting the reinstatement of restrictions. Furthermore, there were growing concerns that governments had not exerted enough effort in developing systems for virus containment.

We conducted our survey and experiment during this phase of the pandemic, in particular, in late November of 2020. At that time, no COVID-19 vaccine had been approved by the European Medicines Agency or the Food and Drug Administration in the USA. There were rumors about the upcoming authorization but there was still considerable uncertainty. The European Medicines Agency approved the first COVID-19 vaccines on December 21, 2020.[15] COVID-19

[14] Our World in Data, Confirmed COVID-19 deaths per million inhabitants. (Last retrieved on August 17, 2022.) See also Figure A1 for a timeline of COVID-19 deaths in international comparison.

[15] European Medicines Agency (2020) EMA recommends first COVID-19 vaccine for authorization in the EU, December 21. Retrieved on August 16, 2022.

vaccines started being administered in Spain on December 27, 2020.[16]

2.2 Contact Tracing

Contact tracing refers to systems to identify and contact all persons that have been in close proximity with an infected individual. In the case of the COVID-19 pandemic in Spain, as in most other countries, these tasks were conducted by teams of workers hired by government health departments. These workers interviewed positive COVID-19 cases by phone, gathered a list of the people that have been in close proximity to them, and reached out to these contacts to recommend them to get tested.[17]

From the beginning of the pandemic, the scientific community and the World Health Organization emphasized the importance of contact tracing in order to reduce virus transmission. In an article published in May 2020, the World Health Organization stated the following: *"when systematically applied, contact tracing will break the chains of transmission of an infectious disease and is thus an essential public health tool for controlling infectious disease outbreaks"* (World Health Organization (2020)). In an article published in the medical journal The Lancet, Kretzschmar et al. (2020) discuss contact tracing as a key component of control strategies during the de-escalation of physical distancing. In particularly before the availability of COVID-19 vaccines, when the disease was associated with high mortality rates, contact tracing was perceived, together with social distancing and masking policies, the key policies for the management of the pandemic.

There is also evidence that contact tracing had a sizeable causal effect in reducing contagion and mortality in settings similar to the one in Spain at the time of our online experiment. Fetzer and Graeber (2021) exploit a coding error in the software to manage contact tracing in the United Kingdom in the fall of 2020, which left untraced around 20% of all cases for more than two weeks. The authors find that one additional COVID-19 case referred late to contact tracing led to 18.6 additional infections and 0.24 deaths in a 6-week period. Taking these estimates at face value, they imply that contact tracing was one of the most cost-effective interventions to

[16] Isabel Valdés (2020) Araceli Hidalgo, 96, the first person in Spain to receive the COVID-19 vaccine, *El País*, December 27. Retrieved on August 16, 2022.

[17] Some countries also developed app-based applications that kept record of other phones—hence, individuals—that had been in close proximity during previous days. That was the case of Germany, for instance. Svea Windwehr and Jillian C. York (2020) Germany's Corona-Warn-App: Frequently Asked Questions, *Electronic Frontier Foundation* , June 17. (Retrieved on August 16, 2022.) In the case of Spain, the app was developed by the Ministry of Health, but it was never active due to problems with compliance with privacy regulations. Sergio Carrasco (2021) The Failures of Spain's Radar Covid App, *Liberties*, May 11. (Retrieved on August 16, 2022.)

save lives, even when compared to interventions in developing countries.[18,19]

Spending on systems of contact tracing had broad support among the Spanish population. It was perceived as enabling some co-existence with the virus without having to impose harsh restrictions that could dampen economic activity. In contrast, policy preferences regarding other measures (mobility or social gathering restrictions) were more heterogeneous: individuals that were more concerned about health issues were more likely to support those measures relative to those more concerned with economic activity.

The importance of contact tracing was frequently discussed in the Spanish media during this time. Oftentimes these informations were accompanied by concerns that governments had not invested enough resources in developing contact tracing systems.[20]

2.3 Government Responsibilities and Political Situation

Spain is a highly decentralized country. Health and education policies are a responsibility of the 17 regional governments (a.k.a. autonomous communities). In the early stages of the COVID-19 pandemic the central government imposed a number of country-wide restrictions, in particular, during the period of state of alarm. However, after June 2020, the regional governments had discretion over the most relevant policies to manage the pandemic, such as curfews, mobility restrictions, or setting restrictions on maximum number of attendants to social gatherings. Chiefly among these responsibilities was the development of contact tracing systems. Most regions developed these systems by mobilizing and hiring workers within primary health care centers to conduct contract tracing activities.

While contact tracing was a responsibility of regional governments, the central government also deployed military personnel to support contact tracing systems. Hence, it is plausible that there is some perceived ambiguity in what level of government is responsible for handling COVID-19 in general, and contact tracing in particular.

[18] Assuming that one contact tracer can trace 6 cases per day, the estimates imply that each contact tracer-day saves 1.44 lives. On average, each contact tracer-day is likely to cost about 100 euros to taxpayers. In contrast, most estimates of cost per life adverted by interventions in developing countries are in the order of thousands of dollars. For instance, see estimates by the NGO Give Well on the cost-effectiveness of vaccines or insecticide treated bed nets in developing countries. Give Well cost-effectiveness analysis. Version 4. Published on April 12, 2022. (Last retrieved on August 9, 2022).

[19] It is likely that at other stages of the pandemic, contact tracing was not as effective at reducing deaths. In particular, after vaccines were distributed or when COVID-19 incidence was as high as to surpass any feasible effort of contact tracing. However, at the time of our online survey in November 2020, vaccines had not yet been approved and COVID-19 incidence was moderate: 588 cases per 100,000 inhabitants in the previous two weeks in Spain and 478 in the United Kingdom in November 1st. (Source: Our World in Data).

[20] Sevillano, Elena G. and Pablo Linde (2020) "España tiene el doble de rastreadores que en julio, pero llegan tarde" (Spain has doubled the number of contact tracers since July, but they are late), *El País*, October 27. (Retrieved on July 17, 2022.)

At the time of our survey, a center-left coalition led by the Spanish Socialist Workers' Party (PSOE) was in control of the central government. This administration had been in power in Spain since 2018 and was reelected following the general election held in November 2019. The different regions are ruled by different party coalitions, as described in Appendix Table A1. Among the 17 autonomous communities and two autonomous cities, 11 were ruled by coalitions led by the Socialist Party, 6 were ruled by the main opposition party (Popular Party, PP), and two were ruled by other parties.

Regional governments held regular meetings with the central government to coordinate certain aspects of the management of the pandemic. However, in some of the regions led by the opposition party, there were frequent clashes with the central government and both levels of government argued that the other level was not doing enough in the fight against the virus.

3 Data Collection and Experimental Design

3.1 Data Collection

The data used in this project was collected on an online survey that we conducted in late November and early December 2020. Field work was conducted by YouGov, which is a well-established data analytics firm.[21] The company has access to a large panel of individuals that have been recruited through online adds and that regularly respond to surveys on a variety of topics. Respondents accumulate points for answering surveys and they can exchange points for small gifts.

The survey that we study in this paper is a follow-up of a first wave that we conducted in May 2020 for the purpose of a different paper (Martinez-Bravo and Sanz (2021)). The sampling framework of the first survey wave was designed to be representative of the Spanish adult population according to age, gender, region of residence, and education level. This was achieved through a quota-sampling system. This system first segments the population into mutually exclusive sub-groups of age, gender, region, and education level. Then it establishes target numbers respondents of each sub-group that would be necessary to achieve representativeness of the sample. These targets are referred as quotas. Individuals are contacted from the company's panel of respondents until the quotas are filled.

In this study we focus on respondents to the November 2020 survey. After dropping individuals that did not complete the questionnaire, did so unreasonably quickly or carelessly, or were members of strata containing only one observation, our final sample contains 3,705 individuals.

[21] https://es.yougov.com

Appendix A provides more details on the construction of the final sample.

The final sample is close to representative of the Spanish population as we show in Table 1. We have a slightly larger representation of tertiary educated respondents, but the other demographics are closely matched to population averages.[22] Table 2 displays the summary statistics of the main variables used in the analysis. We provide more details as these variables become relevant in the analysis.

Our survey proceeds as follows. First, we asked individuals some basic socio-economic questions, such as education level, occupation, and income. Then, to individuals assign to the treatment group, we elicit their priors and provide them the information on the number and deficit of contact tracers. After that, we proceed to collect our main outcomes of interest: respondents' assessments regarding the competence level of different governments; measures of trust in different institutions; willingness to accept a hypothetical COVID-19 vaccine; perceptions of degree of responsibility of different governments in the management of the pandemic; and voting intentions. Finally, individuals in the control group receive the treatment information *after* they have provided their answers to the outcomes of interest. This allows us to obtain the priors also for the control group. We reproduce the complete questionnaire in section F of the Online Appendix.

3.2 Treatment

The main treatment consists of the provision of information on the number of COVID-19 contact tracers in the respondent's region. We obtained the number of tracers in each region from an article published in October 2020 in *El País*, one of the leading Spanish newspapers.[23] This article reported the number of contact tracers active in October for each region. The journalists obtained this information by contacting the different regional health authorities. There were no publicly available statistics on the number of tracers across regions at that time.

In our treatment, we benchmark this information with the number of tracers that would be necessary to trace all cases. We obtained the estimates of the *necessary* number of tracers from the Contact Tracing Workforce Estimator, which is a tool developed provided by the Health Resources and Services Administration of the U.S. Department of Health and Human Services.[24] This tool was designed and made available at the beginning of the pandemic to help interna-

[22] More generally, while it is possible that respondents who participate in online panels are different in some dimensions from the broader population, the literature has found that they provide a good approximation to measure political preferences and behavior (Ansolabehere and Schaffner (2018)).

[23] Sevillano, Elena G. and Pablo Linde (2020) Op. cit.

[24] The international Contact Tracing Estimator is presented in an excel file downloaded from this website https://www.gwhwi.org/estimator-613404.html (Retrieved on August 20, 2021).

tional policy practitioners to determine the contact tracer workforce need based on the particular situations in each locality.[25]

Before providing this treatment, we provide some introductory information regarding the situation of the COVID-19 pandemic in Spain and the recommendation of the scientific community to develop contact tracing systems.[26] Then, we proceed to elicit individuals' prior regarding the number of contact tracers. In particular, individuals are asked to guess how many contact tracers per 100,000 inhabitants their region had in October 2020. They report this estimate by moving a slider over a horizontal colored bar. The bar is shaded in red, yellow, and green and a legend indicates that each portion corresponds to very few, insufficient, and adequate numbers of tracers, respectively. The legend also reflects that in the red portion "more than half of cases cannot be traced", in the yellow portion "all cases cannot be traced", and in the green portion "all cases can be traced". Note that, while we ask respondents to guess one number, the presence of the colored bar and corresponding legend likely helped respondents incorporate a qualitative assessments of performance in their numerical prior.[27]

Finally, we proceed to provide our main information treatment. The next screen—reproduced in Figure 1 for one particular region—uses the same horizontal colored bar used in the prior elicitation to indicate the actual number of contact tracers in the respondent's region. In addition to the number, the screen includes one of the following two messages in capital letters: *"very few contact tracers"* or *"insufficient contact tracers"*. Furthermore, we add a sentence below the slider providing the *deficit* of contact tracers, i.e. the difference between the number of workers necessary to trace all cases and the actual number of workers the region had.

Importantly, we customized the slider used in the prior elicitation and in the treatment to the situation of each region, and in particular to the number of necessary tracers. The first threshold (where the colored slider turns from green to yellow) corresponds to half of the necessary number of tracers. The second threshold approximates the necessary number of tracers and the range to 20% above that number. All numbers were rounded to close large integers. Appendix Table A2 provides the statistics used to construct the information treatment for each region and it indicates the type of message that appears in the main treatment screen.

A subset of individuals assigned to the treatment group obtain an additional treatment. In

[25] The key data inputs of this tool are the population size and the COVID-19 case count from the past 14 days. The estimates on the number of tracers are produced under certain assumptions that capture the production function of contact tracing. These assumptions reflect expert opinion on how contact tracing works in some settings such as Massachusetts and California. We did not modify the preset parameters of the estimator, albeit if anything, they would seem to underestimate the number of necessary tracers. See section A.3 of the Online Appendix for further details on the data on contact tracers.

[26] See Appendix F.2 for the text of the entire treatment section.

[27] See Figure A2 in the Online Appendix for an image of the prior elicitation screen shown to respondents.

particular, they are presented with additional screens showing a histogram with the ranking of regions according to the deficit of contact tracers. Below the histogram we add a sentence specifying the particular position. For instance, the message that residents of the region of Aragón received was *"your Autonomous Community is the 3rd worse in terms of contact tracers"*. These screens are presented in Appendix Figures A3 and A4. This additional treatment aims to test whether individuals engage in relative performance evaluation when evaluating their governments.

3.3 Experimental Design and Empirical Strategy

We assign individuals to treatment groups according to a stratified randomization procedure. First, individuals are classified in 798 groups or strata with similar baseline characteristics in terms of age, education, region and treatment status of a previous study.[28] Within each strata, we randomly assign half of individuals to receive the main treatment and half of the individuals to the control group. Among individuals assigned to the treatment group, half receive the additional treatment with information on the ranking of performance across regions.

The experimental design was pre-specified in a pre-analysis plan (PaP) that we registered with the AEA Randomized Control Trial Registry in October 2020.[29] We also obtained approval from the ethics committee at CEMFI for the survey and experimental design (Application Reference #9; Approval date: October 2020).

As we will show in Section 4.1, the vast majority of respondents received bad news on government performance. Hence, we focus on estimating average treatment effects, and explore heterogeneities by prior in some additional analyses.[30]

Given the randomized nature of the survey design, the empirical strategy is straightforward. Our baseline econometric model is

$$y_{ig} = \beta Treatment_{ig} + \delta_g + \varepsilon_{ig}, \tag{1}$$

where y_{ig} is the outcome of interest for individual i, $Treatment_{ig}$ is an indicator that takes value one for individuals receiving the main treatment, and δ_g are strata fixed effects. The

[28] In particular, we define strata by combination of individuals in the following categories: 19 regions (autonomous communities and autonomous cities), 3 age levels, 2 education levels, and 7 first-wave assignments to a treatment in a previous wave of the survey. The previous treatment was unrelated to contact tracing and it is unlikely to affect the results of the current study.

[29] Deviations from the pre-analysis plan were minor. They are explained in Appendix C. We reproduce the text of the PaP in Appendix Section G.

[30] This follows our pre-analysis plan, in which we first laid out specifications for average treatment effects and then considered the heterogeneous response by priors.

coefficient of interest, β, captures the effect of our main information treatment on contact tracers on outcomes of interest.

The key identifying assumption is that the treatment and the control groups are identical in their observable and unobservable characteristics on expectation. To verify this assumption, we examine whether a number of characteristics differ between the treatment and the control groups. The first two columns of Table 3 show the estimates for two of the variables used in the stratification: age group and education level. The next columns show the results for some additional variables that were not used in the stratification: gender, household income, household income change relative to 2019, the difference between the prior and the actual number of contact tracers, and a dummy indicating whether that difference was positive. The results reveal that covariates are balanced across treatment and control groups.[31]

We also investigated whether treatment assignment is associated with the probability of leaving the survey incomplete. This is typically referred to differential attrition and can lead to biased estimates. Appendix Table A5 shows the results of regressing a dummy taking value one for observations exiting the survey on the treatment indicators. The results indicate that treatments and controls were equally likely to exit the survey. This suggests that selective attrition is unlikely to affect the validity of our estimates.

4 Results

In this section we present the main results of the paper. We first examine whether individuals had accurate information about the quality of contact tracing in their region prior to receiving the treatment. Then we proceed to evaluate how our information treatments affected respondents' attitudes and beliefs.

4.1 Do Individuals Have Accurate Information on Contact Tracing?

To answer this question we first examine the distribution of individuals' priors regarding the number of contact tracers per 100,000 inhabitants in their region, which is represented by the red bars in Figure 2. As we can see, the priors range between 0 and 400 and have a mean of 71. Superposed in this graph we can also find the *actual* distribution of contact tracers in the respondents' regions depicted in black. The actual number of contact tracers per 100,000 inhabitants ranges between 7 and 42 with an average of 20.[32] The comparison of these two

[31] Appendix Table A3 shows analogous results including strata fixed effects. Appendix Table A4 shows balance tests for region of residence. All results suggest there is balance across treatment and control groups.

[32] See Appendix Table A2 for additional statistics of contact tracing across regions.

distributions illustrates that, on average, respondents over-estimate the number of contact tracers in their region. To further investigate this point, for each individual, we compute the difference between their prior and the actual number of contact tracers in their region. Figure 3 reports the distribution of these differences. For 85% of respondents the difference is positive, meaning that they over-estimate the actual number of contact tracers in their region. Furthermore, about one third of respondents over-estimate the number of contact tracers by more than one standard deviation in the distribution of differences between prior and actual contact tracers.[33]

These results indicate that most individuals have a very noisy perception of the number of contact tracers in their region, which was a highly relevant metric of the quality in the management of the pandemic at the time of the survey. Despite the availability of news reporting on the deficiencies of contact tracing systems at the time of our survey, most individuals still over-estimated the number of contact tracers. Finally, these findings also have implications for the interpretation of our results: to most respondents, our information treatment provided negative news about the quality of contact tracing in their region.

4.2 Average Treatment Effects on Perception of Competence and Trust

Next, we examine the effects of our main information treatment on outcomes. We estimate specification (1), which aggregates both treatments and estimates the effect of receiving any treatment on outcomes. We first examine the effects on respondents' evaluation of their governments performance, which we captured with the following question:

> *"On a scale of 0 to 10, where 0 is "very bad" and 10 is "very good", how would you evaluate the quality of management of government X in dealing with a crisis like the COVID-19 one?",*

where we replaced X by regional or central government in two subsequent questions. Since our treatment provides information on a key policy to manage the pandemic, we expect to find changes in the respondents' perception of the degree of competence of their governments in this matter.

Column 1 of Table 4 presents the results. Panel A reports the effects on the assessment of the regional governments and Panel B on the central government. The treatment has a large

[33] In Appendix Table A6 we show the correlates of both the priors and the accuracy of the priors with respondents' demographics. We find that neither the priors nor the accuracy are significantly correlated with gender, age, or education level. We also find that individuals that are sympathizers with their regional government tend to have a higher prior and be more negatively surprised. We return to this point in section 4.4.

and negative effect on the perceived competence of both administrations: competence of the regional government declines by 1.03 points on a 0 to 10 scale, which represents a 21% reduction over the control sample mean. Assessed competence of the central government also declines by 0.59 points, or 15% over the control sample mean.

As expected, the negative information treatment on the quality of contact tracing systems lowered the respondents' assessment of their governemnts' competence in dealing with the crisis. We interpret these results as a first check or as a conceptual *first stage* for our other results.

Next, we proceed to evaluate if the treatment also affected deeper expressions of confidence in the political system. We measure this in different ways. First, we follow the literature in measuring political trust by asking individuals how much confidence they have on different institutions on a scale from 0 to 10.[34] Column 2 of Table 4 reports the results on confidence in the regional and central governments. The treatment significantly reduces both expressions of trust in political institutions. Individuals in the treatment group report a lower level of confidence in the regional government of 0.3 points, or 7% of the control mean, than individuals in the control group. For confidence in the central government the reduction is of 0.2 points or 6.5% of the control mean.[35]

Next, we examine the effects on trust through a variation of a fund dictator game. In particular, we ask the following questions:

> *"Imagine that you win a prize of 1,000€ aimed at alleviating the effects of COVID-19 in Spain. You cannot keep the prize. You can only donate it to the following two institutions: COVID-19 fund from the Ministry of Health of the Central government and the Red Cross. What percentage of the prize would you donate to each of them?"*

In a subsequent question, we ask respondents to allocate donations across a similar fund from their regional government and the Red Cross. These questions are inspired in the well-known dictator game in experimental economics, in which players need to choose how much

[34]This is a similar wording to the one used in the World Value Survey and other surveys. See question 28 in Appendix F for the complete question.

[35]The magnitude of our estimates is similar to those of other papers in the literature. For instance, Kuziemko et al. (2015) find that providing information about inequality leads to a decrease in trust. They measure trust with a binary variable taking the value of 1 if the respondent answers "always" or "most of the time" as opposed to "only some of the time" and "never" when asked about how much of the time they can trust the federal government of the US to do what is right. They find a reduction in trust of 2.9 p.p. for a control mean of 0.158, which corresponds to a 18.3% effect. To define our dependent variable in a similar way to Kuziemko et al. (2015), we measure trust with a binary variable taking the value of 1 if the respondent expressed a level of trust in the regional government of 7 or higher (on a 0-10 scale). When defined this way, we find a a 2.2 p.p. effect for a control mean of 0.198, which corresponds to an 11.1% effect.

money to allocate to different purposes.[36] Answers to this game may capture individuals' willingness to support and contribute to government organizations relative to a well respected NGO. The outcome variables are two dummies indicating whether the share of the prize donated to the regional (or central) government, relative to the Red Cross, is equal to or above 50%.[37] The results, presented in column 3 of Table 4, indicate that the information treatment significantly lowers the respondents' propensity to contribute to government funds, both for the regional and central government. While the magnitudes are moderate, they consistently show that receiving negative information about government performance can crowd out individuals' willingness to financially support the state.

Finally, we consider individuals' willingness to accept a hypothetical COVID-19 vaccine. We ask the following question:

> *"Suppose that in the next few months a vaccine against COVID-19 is approved. Imagine that the government X recommends vaccination in your age group. How likely would you be to follow the government's recommendation and agree to be vaccinated?"*

where X corresponds to regional or central government in two subsequent questions. We define the outcome variables as indicators for answering that they would certainly accept to be vaccinated.[38] The effects on these outcomes are reported in column 4 of Table 4. We find that the information treatment significantly lowers the respondents' willingness to accept the COVID-19 vaccine by 4 percentage points. The estimates represent 8% and 11% declines over the control sample mean if recommended by the regional and central government, respectively. These results indicate that learning about a deficient management of the pandemic also erodes individuals' willingness to follow the advice of governments in key matters, such as vaccination against a serious disease. Note that given the hypothetical and uncertain nature of COVID-19 vaccines at the time of our study, it is likely that our measure of vaccine acceptance provides a measure of trust in government advice, rather than of compliance with regulations. See section

[36] Note, however, than in the standard dictator game players can keep the money for themselves, while in our formulation we require a donation between two entities. Also, due to logistical difficulties in setting up payment systems, the games are not incentivized. However, most respondents report answers broadly consistent with their other attitudes. The reported contribution to the central government and the measure of trust are significantly correlated.

[37] About 60% of respondents choose values 0, 50%, or 100%. Hence, a binary outcome variable captures better the underlying variation than a continuous one.

[38] The possible answers to the question were *I would certainly accept to be vaccinated; It is likely that I would accept to be vaccinated; I do not know whether or not I would accept to be vaccinated; It is likely that I would not accept to be vaccinated; I would certainly not accept to be vaccinated; I do not know*. The results are robust to specifying the dependent variable in a linearized way. See Appendix Table A7.

C in the Appendix for additional results on proxies of compliance.[39]

Overall, the results presented in Table 4 indicate that receiving negative information about government performance erodes trust and willingness to support the government. The magnitude of the effects is similar for confidence in both the regional and central government. This is natural since the areas of responsibility regarding the management of the pandemic were not clearly delineated among these two administrations. Indeed, most respondents evenly attribute responsibility among both administrations, a point to which we return later in the paper. Next, we explore whether these negative effects on confidence also spillover to other state institutions that have little or no responsibility over the management of the pandemic. The results are presented in Panel A of Appendix Table A8. We find no effect on trust in the Spanish Congress of Deputies and there is a negative—albeit insignificant—effect on trust in local governments, the judiciary system, and the European Union. The last column shows the result for an index aggregating the effects on these four institutions.[40] While the effect is negative, it is not statistically significant at conventional levels (the p-value is 0.23). Overall, these results provide suggestive evidence that, if anything, trust in political institutions may decline upon receiving negative news about government performance, even when not directly responsible.[41]

4.3 Heterogeneity Analysis

Next, we examine if our main results are heterogenous across individuals that had different priors about the number of contact tracers. Table 5 shows the effects on perceived confidence and trust in the regional government. Columns 1 and 4 present the baseline results for comparison. The other columns show specifications that include an indicator for individuals whose difference between the prior and the actual number of contact tracers was higher than the median, as well as its interaction with the treatment dummy. The coefficient on this interaction captures the *additional* effect for the individuals more negatively surprised by the information treatment.

[39] More specifically, in section C of the Appendix we provide results on willingness to wear masks and compliance with quarantines. Interestingly, the treatment did not affect these outcomes. One possible interpretation is that, at that stage of the pandemic, both masking and quarantines were familiar technologies for virus containment. In contrast, there was still considerable uncertainty about the effectiveness and safety of Covid-19 vaccines. Hence, the measure of hypothetical vaccine acceptance at that point may better interpreted as a measure of trust in government advice rather than of compliance. See section C in the Appendix for further discussion.

[40] We construct indices by standardizing each variable in the index, then taking the mean of the standardized variables.

[41] In panel B we show results for confidence in non-state entities, such as epidemiologists, economists, media, and pharmaceutical companies. There is no significant effect for any of these institutions or for the index. This result suggests that there is not a generalized negative effect on all responses of trust. This is supportive of the idea that respondents considered the questions carefully and evaluate different entities independently.

This additional effect is negative albeit imprecisely estimated.[42]

In columns 3 and 6 we examine whether the effects are stronger for the subsample of respondents that express a high degree of confidence in their priors. We measure strength of priors by asking respondents to assess on a scale from 0 (least confident) to 10 (most confident) how sure they are about their prior of contact tracers. The data indicate a moderate degree of confidence in peoples' prior: the average value of this variable is 4.6. It is likely that individuals with weak priors did not rely on them much on them when updating their measures of confidence or trust in institutions. To examine this, we restrict the samples in columns 3 and 6 to individuals are in the top quartile of the distribution of prior's confidence. The results indicate that, for this subsample, the effects are highly heterogenous by individuals' priors and only significantly negative for those individuals that were more negatively surprised.[43,44]

These findings suggest that individuals more negatively surprised have stronger negative effects on perceived competence and trust in the regional government. This is consistent with our pre-registered hypothesis and supports the notion that our results on trust are driven by processing the information on government performance.

4.4 Attribution of Responsibilities and Accountability

Next, we examine whether individuals' political leanings interfere with how they process the negative news about government performance. First, we study whether individuals endogenously change their attribution of responsibility across levels of government upon receiving negative news about the management of the pandemic. To measure this, we asked the following question:

> *"We would like to ask you about which institution you think bears greater responsibility in the management of the COVID-19 pandemic in your region (containment*

[42] Unfortunately, since most respondents underestimated the number of contract tracers, we do not have a meaningful sample of individuals that over-estimated contract tracers to evaluate the effect on this subpopulation.

[43] In Appendix Table A9 we show that the results are robust to using a linear variable (prior - actual number of contact tracers) instead of the above-the-median dummy. In Appendix Table A10 we show the results for assessed competence and trust in the central government. In this case, the heterogeneity by prior is less clear-cut. One possible explanation of these results is that individuals only used the difference between the prior and actual number of tracers to learn about the quality of performance of the regional government, but not of the central government. The effects on attitudes towards the central government may be more affected by other considerations, such as political sympathies. We return to this hypothesis in the next sub-section.

[44] In the Appendix, we examine the existence of heterogenous effects by whether respondents obtained the additional treatment, which provided a comparison of performance across regions. Appendix Table A11 shows the effects on competence assessment and trust in the regional government and Appendix Table A12 presents analogous results for the central government. The results indicate that, in general, receiving this additional treatment does not lead to differential effects. The only exception is for individuals living in low-performing regions. For those individuals, the additional treatment makes them further update downward their assessment of regional government performance and trust in the regional executive.

measures, healthcare, contact tracing, testing, etc.). On a scale of -10 to 10, where -10 is "all responsibility lies with the central government" and 10 "all responsibility lies with the regional government", what degree of responsibility would you attribute to each government?"

Figure 4 shows the empirical distribution of this variable for respondents in the control group. The mode of the distribution is 0, indicating that the most common answer corresponds to evenly assigning responsibility between the central and the regional government. However, there is also considerable variation in the degree to which individuals assign responsibilities across the different levels of government.

In Table 6 we explore the treatment effects on this variable. Column 1 shows that, on average, the treatment makes respondents assign a greater responsibility to the central (relative to the regional) government. While this result is interesting, we did not have a prior prediction regarding this effect. More interestingly, we examine how this effect differs depending on the political alignment of individuals. Our prior was that individuals politically aligned to the regional government would change their attribution of responsibility by assigning greater responsibility to the central government. We provide a test for this in column 2, where we interact the main treatment indicator with a dummy that takes value of 1 for respondents that voted for one of the parties that support the incumbent regional government.[45] The uninteracted coefficient indicates that individuals not aligned to the regional government do not change their attribution of responsibility. In contrast, the treatment makes aligned individuals attribute a greater responsibility of the management of the pandemic to the central government. We call this result the *blame-shifting effect*. One possible interpretation of this finding is that those individuals experienced discomfort when confronting evidence suggesting that their preferred government was performing poorly. This may have led them to find other actors to blame, in particular the central government. This type of behavior is consistent with theories of confirmation bias or cognitive dissonance,[46] as well as with recent evidence of *scapegoating* during crises (Bursztyn et al. (2022)).

Naturally, we expect this effect to be driven by regions where being aligned to the regional government means being misaligned to the central government. In column 3 we restrict the

[45] See Appendix Table A1 for the parties forming each regional government coalition. See also section A.4 in the Appendix for details on the construction of this variable. The results are similar if we use alternative definitions of alignment, for instance, by focusing on the party of the regional governor. These results are available upon request.

[46] Some examples of applications of confirmation bias in the economics literature are the following: Mullainathan and Shleifer (2005) argue that individuals have a preference for media outlets that confirm their world views; Mullainathan and Washington (2009) find that the act of voting for one party makes individuals express more lenient evaluation of the performance of that party.

sample to regions where the two levels of governments are supported by parties in opposite sides of the ideological spectrum, i.e., a center-right regional government and a left-wing central government. We label these regions as having "divided governments".[47] The results indicate that the blame-shifting effect is entirely driven by these regions. In regions with non-divided governments there are no effects, as shown in column 4. In those regions there is limited scope for shifting the blame since both levels of government are supported by the same parties.

The blame shifting effect can have important implications for the exercise of political accountability. If individuals endogenously change their attribution of responsibility upon receiving negative news about government performance, politicians may not suffer declines in their reelection probability after deficient performance.[48] We examine this by studying the effects on voting intentions. The dependent variables in Table 7 are indicators for willingness to reelect the incumbent government if elections were to be held again tomorrow. Note that the number of observations is smaller because some respondents did not to respond to these questions.[49,50] In columns 1 and 2 we restrict the sample to regions with divided governments. We find that in those regions—where the blame shifting effect is present—, the treatment does not affect the voting intention for either the regional government or the central government. In contrast, columns 3 and 4 show that in regions with non-divided governments—where there is no evidence of blame shifting—, we find large declines in the willingness to reelect both the regional and the central government incumbent. The regional and central governments experience declines of 7 p.p. and 9 p.p. in their reelection rate, respectively.

These results are consistent with the hypothesis that individuals' political sympathies of individuals affect how they process the information on government performance. In particular, by endogenously changing the attribution of responsibility, individuals may downplay the informativeness of signals that convey negative performance of their preferred political representatives. This could hinder political accountability, by limiting the extent to which negative information on performance translates into voting behavior. These patterns are likely to be more acute in settings with highly polarized political preferences and where areas of responsibility across levels of government are more ambiguous.

[47] Regions with divided governments are Andalucía, Castilla y León, Cataluña, Madrid, Galicia, and Murcia. See Appendix Table A1 for details.

[48] Implicit in this argument is the assumption that the voters politically aligned to the regional government—which are the ones shifting the blame to the central government—are the majority in their region. This is a natural assumption since the regional incumbent, by definition, earned the support of most voters in the previous election.

[49] In particular, the dependent variable takes value 1 if the respondent intends to vote for one of the parties that supports the governing coalition of the central or regional government, respectively. See column 3 of Appendix Table A1 for the list of supporting parties in each region.

[50] The other results in the paper are similar when we restrict to this smaller sample. The results are available upon request.

4.5 Robustness and Additional Results

Experimenter Demand Effects An important concern in experimental methodologies is the presence of social experimenter demand effects. This refers to the possibility that respondents provide the answers that they think the experimenter or research team wants them to report. This is particularly problematic when the treatment induces individuals to make a differential inference regarding experimenter's intentions. Previous studies have found little evidence of experimenter demand effects in online experiments. See de Quidt et al. (2018), for instance. However, we provide evidence that suggests that the effects may also be small in our setting. First, at the beginning of the questionnaire we state that the results of the study will be used by a team of researchers from the *Center for Monetary and Financial Studies* and other academic institutions. At the same time the survey is fielded by the data analytics company YouGov. It is unclear what type of inference respondents would make regarding the intentions of researchers. Perhaps, respondents are (correctly) inferring that researchers are economists. However, we do not find that respondents exposed to the treatment develop a different attitude towards economists. Column 2 of Appendix Table A8, panel B, shows that there is no effect on trust in economists.

Another concern is that the treatment may induce individuals to have a more negative mindset or a pessimistic view of the world. However, as indicated shown in Appendix Table A8, there is no evidence that the treatment induced a generalized decline in trust in different organizations. Only institutions more directly linked to our government performance measure seem affected. We also find that there are no effects on broader measures of well-being. In particular, we examine effects on responses to the following question: *(question 73) "On a scale of 0 to 10, where 0 indicates "great discomfort or depression" and 10 indicates "full happiness", how would you rate your emotional well-being?"*. There is no evidence that the treatments had effects on subjective levels of well-being. We present these results in Appendix Table A13.

A related concern is that our treatment may have led to a generalized level of disappointment with political institutions by increasing the salience of COVID-19 containment policies and the degree of government responsibility during the pandemic. However, a number of results are at odds with this being the driver of our results. First, as shown in Appendix Table A8 the treatment did not generate a generalized decline in trust across different types of political institutions. Second, we do find that the effects on performance assessment and trust in regional governments are heterogeneous by prior. Third, a generalized disappointment with government cannot explain the blame-shifting results, which are heterogeneous by political alignment. Overall, this evidence is consistent with respondents updating their beliefs about the quality of government performance and areas of responsibility and, hence, changing their

attitudes accordingly.

Robustness Main Results Appendix Tables A14, A15, A16, and A17, show robustness checks for our main results. Column (1) in each table shows our baseline results for comparison. Column (2) drops the strata fixed effects, hence, presenting results without controls. Column (3) drops the region of Galicia, for which we have less reliable information regarding the number of contact tracers as described in Appendix section A.3. In column (4) we control for a set of controls that we pre-specified in our PaP: indicators for past voting decisions, left-right ideological position on a 1-10 scale, gender, nationality, socio-economic situation (pre-pandemic and change with the pandemic), household income (pre-pandemic and change with the pandemic), and baseline values of the outcomes as measured in the first wave of the survey conducted in July 2020 to the same individuals. All results are robust to these robustness exercises. See section B in the Appendix for further details.

Robustness Blame-Shifting Results In Appendix Table A18, we implement the robustness checks described above to the blame-shifting results. The results are highly robust.

We also explore an alternative interpretation of the blame-shifting results. Note that as we discussed in Section 4.1 and show in Appendix Table A6, individuals aligned with the regional government had, on average, a higher prior on performance. This is natural, since they are sympathizers of the regional incumbent. However, their differences in prior could generate different treatment effect since aligned individuals may update their beliefs to a greater extent. In other words, aligned individuals were more negatively surprised about the information treatment. It is unclear how this would bias the estimates, since we do not have clear predictions how this should affect attribution of responsibility. Nevertheless, we explore whether our results are robust by controlling for the individuals' prior and its interaction with the treatment. Appendix Table A19 shows that the results are fully robust to this specification. The main coefficients of interest are unaffected, even when we also let the prior have a different impact by political alignment and treatment status. The results are also similar, albeit less precisely estimated, when restricting the sample to individuals highly confident about their prior.

In Appendix Table A20, we examine the heterogeneity of the blame-shifting effects by whether individuals obtain the additional treatment that showed the ranking across regions. While the evidence needs to be taken with caution due to the multiple slicing of the data, the results are thought-provoking: the blame-shifting effects are much smaller in the sample that obtains the ranking treatment. One possible interpretation of these results is that, when indi-

viduals see the performance of their region in comparison with other regions, they have less scope to shift the blame to the central government (perhaps because they see that even holding constant the central government, some regions are indeed performing better than theirs).

Robustness Accountability Results In Appendix Table A21 we examine alternative dependent variables for the accountability results. We consider sympathy for the parties supporting the regional government, and the average feeling for them. These measures may be less sensitive than voting intentions. The results are high robust to using these other dependent variables.

Additional Results In Appendix Tables A23 and A22 examine the heterogeneity of effects on accountability and trust by divided government and political alignment. An important caveat is that statistical power is significantly reduced when we examine these two dimensions of heterogeneity simultaneously. Consistent with the reduced power, most results do not show notable heterogeneities. The only exception, shown in Appendix Table A22, is that individuals aligned to the regional government in divided regions have a negative effect on trust in the central government, which is consistent with the blame shifting behavior. Note that we do not observe an analogous negative effect on electoral support for the central government in Appendix Table A23. This is likely to be the case because individuals aligned to the regional government have very low levels of voting intentions for the central government in any case. Hence, there is not much margin to further reduce electoral support for this group.

Finally, Appendix C considers some additional outcomes that we intended to study following our pre-analysis plan: compliance with rules and regulations, political polarization, and support for taxation and redistribution. Overall, we do not find significant effects for these outcomes.

5 Conclusion

How do individuals process information on the performance of their governments at times of crisis? The COVID-19 pandemic offers a unique setting to study this question. The rapidly changing reality of the pandemic represented a challenge to most governments throughout the world. Policymakers had to rapidly adjust their decision-making and decide over new policies and actions. In this study we focus on a policy that was perceived as a key to reduce the spread of the virus during the early months of the pandemic: the development of contact tracing systems. From the beginning of the pandemic, the World Health Organization and the scientific community recommended developing systems to trace the virus. Countries that were successful

at the containment of the virus had highly effective contact-tracing systems, such as South Korea or New Zealand.

In Spain, the strict lockdown that took place between early March and late April effectively reduced the spread of the virus. During the summer of 2020 there was the expectation that contact-tracing systems, together with other restrictions, could contain the spread of the virus. However, early in the fall of 2020 numerous news articles indicated that the number of contact tracers was insufficient to trace all COVID-19 cases effectively in almost all regions. While contact-tracing, as well as with most other health provision areas are a responsibility of the regional governments, the central government contributed to these systems with the occasional deployment of military personnel to work as contact-tracers.

In this study, we first show that individuals have very imperfect information on the number of contact tracers in their region. 85% of individuals over-estimate the quality of the contact tracing systems in their region. This is despite the fact that respondents were given a colored-range to guide the interpretation of the number of contact tracers. Second, we show that providing information on the actual number of contact tracers has significant effects on a number of different outcomes. We show that it decreases the assessed level of competence of both regional and central governments. It also has negative effects in trust in political institutions. Third, we find that the treatment also negatively affects the willingness of people to accept an eventual COVID-19 vaccine. This indicates that information that may erode trust in government institutions could also reduce compliance with government directives. Fourth, we find that individuals endogenously change their attribution of responsibility across levels of government. Individuals that are politically aligned to the regional government attribute greater responsibility of the management of the pandemic to the central government when presented negative news on contact tracing systems. Fifth, we find that accountability is reduced when the government is divided: when the regional and central government are opposing political coalitions, the treatment does not induce any punishment to either the central or the regional government. By contrast, when the same coalition is in office, then both the central and the regional governments lose support. These results suggest that political accountability may be difficult in highly polarized contexts and in federal systems, since individuals may shift the blame to levels of government they are not politically aligned with.

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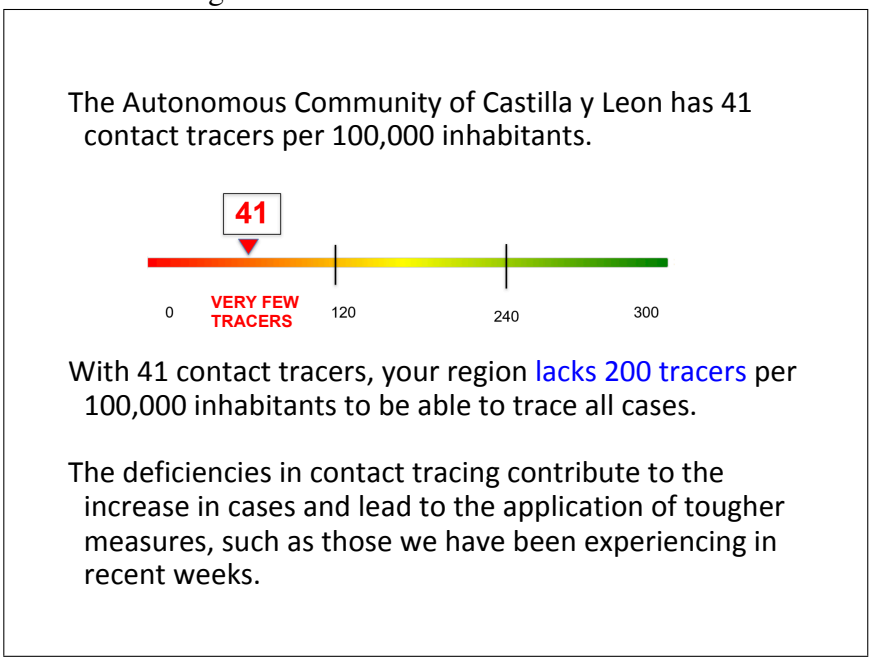
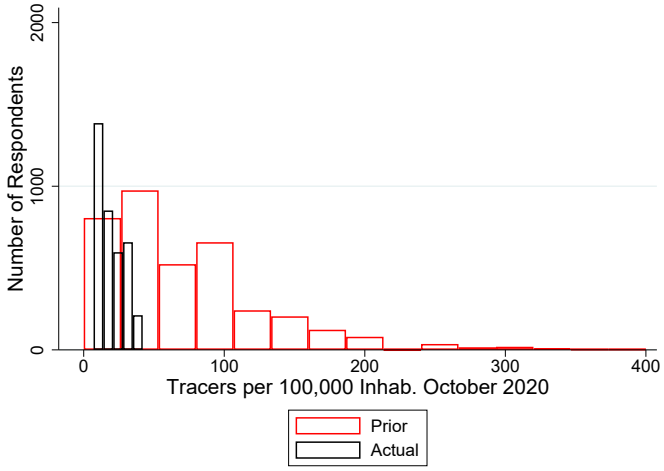
Figures

Figure 1: Main Screen of the Treatment



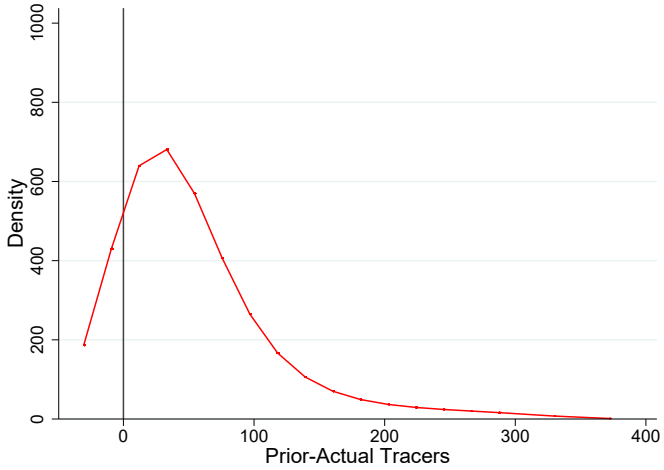
Notes: Main treatment screen shown to the treatment group prior to the collection of outcomes.

Figure 2: Distribution of Priors Regarding the Number of Contact Tracers



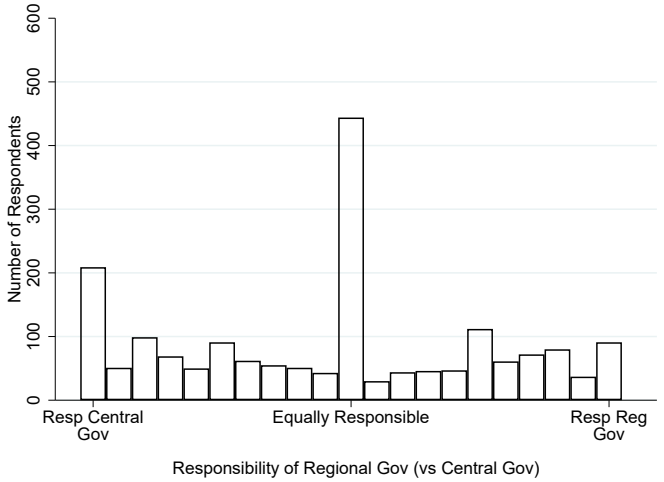
Notes: Histograms of individuals' priors regarding the number of contact tracers in their region (in red) and the actual number of contact tracers in the individuals' regions (in black). The y-axis shows the number of respondents in each bin.

Figure 3: Distribution of Prior-Actual Number of Contact Tracers



Notes: Density of the difference between the prior and the actual number of contact tracers. To estimate the densities, we use the Poisson regression method known as "Lindsey's method". First, we split the variable of interest into n equally sized bins. Second, we take the central value of the variable for each bin ($x_{(k)}$, where k denotes the corresponding bin) and compute up to its 4th power. Third, we count the number of observations in each bin ($\mu_{(k)}$). At this point, we assume that $\mu_{(k)}$ follows an iid Poisson distribution, which is described by an exponential polynomial with 4 degrees of freedom on $x_{(k)}$: $log(\mu_{(k)}) = \sum_{j=0}^{4} \beta_j x_{(k)}^j$. (We choose 4 degrees of freedom to balance the bias-variance trade-off: lower-order polynomials do a poor job in fitting the data, and higher-order polynomials do not fit it substantially better.) Then, we estimate $\{\hat{\beta}_j\}_{j=0}^{4}$ by maximum likelihood, and compute the predicted number of observations for each bin. Finally, we obtain the estimated densities by plotting the predicted number of observations ($\hat{\mu}_{(k)}$) against the central values of the variable ($x_{(k)}$) for each bin.

Figure 4: Distribution of Attribution of Responsibility (Control Group)



Notes: Histogram of control group responses to the question of which institution bears greater responsibility in the management of the COVID-19 pandemic (containment measures, healthcare, contact tracing, testing, etc.). The y-axis shows the number of respondents who choose each numeric answer ranging from -10 ("all responsibility lies with the central government") to 10 ("all responsibility lies with the regional government").

Tables

Table 1: Sample Characteristics

	Spanish Population (source: INE)	Our Sample
Female	0.52	0.50
Ages 18-24	0.08	0.06
Ages: 25-34	0.14	0.15
Ages: 35-44	0.19	0.22
Ages: 45-54	0.19	0.22
Ages: 55+	0.39	0.33
North-East Region	0.21	0.21
East Region	0.14	0.14
South Region	0.24	0.24
Center Region	0.22	0.25
North-West Region	0.09	0.09
North Region	0.09	0.07
Primary Education or Less	0.18	0.10
Secondary Education	0.29	0.19
Upper Secondary Education	0.14	0.18
Vocational Training	0.08	0.11
Tertiary Education	0.31	0.41
Observations	1	3705

Notes: This table displays representative statistics from the National Institute of Statistics (INE) in 2019 alongside summary statistics from our survey.

Table 2: Summary Statistics

	Mean	Min.	Max.	Std. Dev.	Observations
Demographic Characteristics					
Female	0.50	0.00	1.00	0.50	3705
Age Group	2.17	1.00	3.00	0.79	3705
Age	46.48	18.00	91.00	13.97	3705
Education Level	1.78	1.00	2.00	0.42	3705
Household Income	2274.34	0.00	8000.00	1632.10	3359
HH Income Change	-216.41	-1500.00	1000.00	470.53	3525
Variables for Heterogeneities					
Prior-Actual	51.31	-41.00	383.00	59.10	3705
Divided Gov	0.67	0.00	1.00	0.47	3705
Aligned Regional Gov	0.34	0.00	1.00	0.47	3705
Outcomes					
Competence Regional Gov	4.34	0.00	10.00	2.65	3705
Competence Central Gov	3.60	0.00	10.00	2.70	3705
Trust Regional Gov	3.78	0.00	10.00	2.75	3705
Trust Central Gov	3.03	0.00	10.00	2.87	3705
Contrib. Regional Gov$\geq$50%	0.63	0.00	1.00	0.48	3489
Contrib. Central Gov$\geq$50%	0.58	0.00	1.00	0.49	3451
Vaccine Regional Gov	0.33	0.00	1.00	0.47	3551
Vaccine Central Gov	0.34	0.00	1.00	0.47	3558
Resp Reg Gov vs Central Gov	-0.94	-10.00	10.00	6.02	3705
Vote Regional Gov	0.38	0.00	1.00	0.49	2980
Vote Central Gov	0.35	0.00	1.00	0.48	2982

Notes: This table displays summary statistics of the main variables used in the study. The unit of observation is a respondent. Some of the outcomes have a smaller number of observations as respondents were allowed not to respond to those questions.

Table 3: Balance of Characteristics across Treatment and Control Groups

	Age Group	Education Level	Female	Household Income	HH Income Change	Aligned Reg Gov	Ideology 1-10	Prior-Actual	Indicator (Prior-Actual) > p50
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Treatment	0.00	0.01	0.03	-55.03	4.54	-0.02	0.12	-0.06	0.00
	(0.03)	(0.01)	(0.02)	(56.31)	(15.86)	(0.02)	(0.08)	(1.94)	(0.02)
Observations	3,705	3,705	3,705	3,359	3,525	3,705	3,699	3,705	3,705
R^2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dep. Var. Mean (Control)	2.17	1.77	0.49	2301.97	-218.69	0.35	4.57	51.34	0.47

Notes: Robust standard errors shown in parentheses. The unit of observation is the respondent. No controls included. The dependent variables are age group codified as follows (1 for ages 18-35, 2 for ages 36-50, 3 for ages above 50); education level codified as follows (1 if no schooling, primary or secondary, 2 if above secondary education); monthly household income in 2019 in euros; change in monthly household income from 2019 to November 2020 in euros; aligned with the regional government (=1 if aligned, as described in Appendix A.4); pre-recorded political ideology (1=extreme left, 10=extreme right); difference between the actual number of contact tracers in their region of residence and their prior; a dummy indicating whether this difference is negative. *p<0.1; **p<0.05; ***p<0.01.

Table 4: Effects on Perceived Competence and Trust in Governments

	Dependent Variables			
	Competence of Government (scale 0-10)	Trust (scale 0-10)	Contribution Gov$\geq$50%	Vaccination Acceptance
	(1)	(2)	(3)	(4)
	Panel A. Regional Government			
Treatment	-1.05***	-0.31***	-0.04**	-0.03**
	(0.09)	(0.09)	(0.02)	(0.02)
Observations	3,705	3,705	3,470	3,537
R^2	0.19	0.17	0.15	0.16
Dep. Var. Mean (Control)	4.88	3.95	0.64	0.35
	Panel B. Central Government			
Treatment	-0.59***	-0.20**	-0.04**	-0.04**
	(0.09)	(0.10)	(0.02)	(0.02)
Observations	3,705	3,705	3,429	3,545
R^2	0.16	0.14	0.16	0.16
Dep. Var. Mean (Control)	3.91	3.13	0.60	0.36

Notes: Robust standard errors shown in parentheses. The unit of observation is the respondent. All specifications include strata fixed effects. The dependent variables are perceived of competence of the regional (or central) government, on a 0-10 scale; trust in the regional (or central) government, on a 0-10 scale; a dummy indicating that the respondent would donate to the regional (or central) government half or more of a hypothetical prize; and a dummy indicating that the respondent would "very likely" get vaccinated if the vaccine were recommended by the regional (or central) government. *p<0.1; **p<0.05; ***p<0.01.

Table 5: Heterogeneous Effects on Perceived Competence and Trust (Regional Government)

	Dependent Variables:					
	Perceived Competence of Regional Gov			Trust in Regional Gov (scale 0-10)		
	Full Sample	Full Sample	Strong Prior	Full Sample	Full Sample	Strong Prior
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	-1.05***	-0.92***	-0.33	-0.31***	-0.27**	-0.09
	(0.09)	(0.12)	(0.27)	(0.09)	(0.12)	(0.27)
$\mathbb{1}\{\text{(Prior-Actual)} > \text{p50}\}$		1.32***	2.34***		1.22***	2.48***
		(0.13)	(0.34)		(0.14)	(0.35)
T*$\mathbb{1}\{\text{(Prior-Actual)} > \text{p50}\}$		-0.29*	-0.99**		-0.11	-0.92**
		(0.17)	(0.44)		(0.19)	(0.43)
Observations	3,705	3,705	815	3,705	3,705	815
R^2	0.19	0.23	0.37	0.17	0.20	0.39
Dep. Var. Mean (Control)	4.88	4.88	4.93	3.95	3.95	4.28

Notes: Robust standard errors shown in parentheses. The unit of observation is the respondent. All specifications include strata fixed effects. The dependent variable are perceived of competence of the regional government, on a 0-10 scale, and trust in the regional government, on a 0-10 scale. Strong prior is defined as individuals in the top quartile of the distribution of confidence in their prior. They are the ones that selected 7 or above on a 0-10 scale. *p<0.1; **p<0.05; ***p<0.01.

Table 6: Blame-shifting: Perceived Responsibility in Managing the Pandemic

	Dependent Variable: Responsibility of Regional Gov (vs. Central Gov)			
	Sample:			
	All		Divided Gov	Non-divided Gov
	(1)	(2)	(3)	(4)
Treatment	-0.42**	-0.08	0.01	-0.18
	(0.20)	(0.25)	(0.29)	(0.46)
Aligned Reg Gov		-1.15***	-2.41***	1.89***
		(0.33)	(0.39)	(0.57)
T*Aligned Reg Gov		-1.08**	-1.45***	-0.06
		(0.45)	(0.53)	(0.81)
Observations	3,705	3,705	2,498	1,207
R^2	0.14	0.15	0.15	0.24
Dep. Var. Mean (Control)	-0.75	-0.75	-0.47	-1.33

Notes: Robust standard errors shown in parentheses. The unit of observation is the respondent. All specifications include strata fixed effects. The dependent variable is which institution the responder thinks has a greater responsibility in the management of the COVID-19 pandemic in their region of residence on a -10 to 10 scale, where -10 means all responsibility is of the central government and 10 means that all responsibility is of regional governments. Aligned Reg Gov = 1 if the respondent voted for one of the parties supporting the regional government in the past general election—see Section A and Table A1 for details. Divided Gov = 1 for respondents living in a region where there is no overlap between the parties supporting the regional and central governments—see Table A1 for details. *p<0.1; **p<0.05; ***p<0.01.

Table 7: Accountability

	Dep Var: Indicator for Intention to Vote for Incumbent Government			
	Divided Gov		Non-divided Gov	
	Vote Regional Gov	Vote Central Gov	Vote Regional Gov	Vote Central Gov
	(1)	(2)	(3)	(4)
Treatment	-0.02	0.01	-0.07**	-0.09**
	(0.02)	(0.02)	(0.03)	(0.04)
Observations	1,910	1,910	893	893
R^2	0.14	0.12	0.29	0.26
Dep. Var. Mean (Control)	0.39	0.32	0.44	0.45

Notes: Robust standard errors shown in parentheses. The unit of observation is the respondent. All specifications include strata fixed effects. The dependent variable Vote Regional Gov equals 1 if the respondent intends to vote for any of the parties in the regional government in the next regional election. The dependent variable Vote Central Gov equals 1 if the respondent intends to vote for any of the parties in the central government in the next general election. Divided Gov = 1 for respondents living in a region where there is no overlap between the parties in office at the regional government and the parties in office at the central government—see Table A1 for details. The sample is reduced due to some respondents preferring not to declare their voting intention. *p<0.1; **p<0.05; ***p<0.01.