Social Norms, Political Polarization, and Vaccination Attitudes: Evidence from a Survey Experiment in Turkey*

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Abstract

This paper examines vaccination as a social norm in the context of the Covid-19 pandemic. Using a large-scale survey experiment in Turkey, we first elicit respondents' vaccination attitudes and show that political affiliation is a strong predictor of it. We then use economic games to measure the extent of outgroup discrimination induced by respondets' attitudes towards vaccination. We find that pro- and anti-vaxxers discriminate each other substantially. This polarization intensifies when pro- and anti-vaxxers perceive a political difference between them. Using randomized informational treatments, we show that the promotion of a broadly shared social identity might mitigate such outgroup discrimination.

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1 Introduction

Social norms have a significant impact on behavior in numerous economic and social domains. They play a crucial role in overcoming the coordination problem that arises in large groups of people by encouraging individuals to act in ways that are personally costly but socially beneficial (Cialdini et al., 1990; Bernheim, 1994; Bicchieri, 2005; Goette et al., 2006; Cooper and Weber, 2020).[1] Enforcement mechanisms such as exclusion and ostracism ensure that individuals follow the social norms (Fehr and Gächter, 2000; Masclet et al., 2003; Balafoutas and Nikiforakis, 2012; Balafoutas et al., 2014). However, these mechanisms may not be sufficient for enforcing social norms in very polarized societies, for example, with respect to political views; and when the polarized groups do not welcome each other (Herrmann et al., 2008; Gächter and Herrmann, 2011; Grimalda et al., 2023).

In this paper, we document such a case in the context of Covid-19 vaccination in Turkey, investigate its political dimension, and present ways to overcome polarization with the ultimate goal of restoring the social norm. In our representative sample of Turkey, about 80% conform to the social norm of getting vaccinated –*pro-vaxxers*; about 20% violate it –*anti-vaxxers*. We first study the socio-demographic and socio-economic characteristics of those who conform to the social norm and those who violate it. We then measure the outgroup bias between these two groups as an indicator of polarization evoked by the Covid-19 vaccination, and explore the impact of political affiliations on conforming with the vaccination norm in a politically polarized setting such as Turkey. Furthermore, we show that the political polarization exacerbates the outgroup discrimination based on vaccination attitudes. Finally, using randomized informational treatments, we show that the promotion of a more broadly shared social identity might mitigate the outgroup discrimination based on vaccination attitudes.

We consider getting vaccinated as a social norm for two reasons. First, based on the World Health Organization and UNICEF's estimations of immunization coverages for well-known contagious diseases such as polio and measles for which vaccines have been long available, vaccination emerges as a descriptive norm in Turkey as the typical vaccination rates range between 95-100%.[2] Second, Covid-19 vaccinations had the utmost potential to

[1] It is worth noting that there is a vast literature on the role of social norms in encouraging individuals to behave optimally, even when it is not necessarily in their best interest to do so. See, e.g., Kimbrough and Vostroknutov (2016), Fehr and Schurtenberger (2018), Bicchieri and Dimant (2022), and Bicchieri et al. (2022).

[2] The immunization coverage profiles of countries, including Turkey, are available at https://data.unicef.org/resources/immunization-country-profiles/.

greatly benefit the society by halting the pandemic and saving lives with minimal risks on the vaccinated (Polack et al., 2020; Liu et al., 2021; Barro, 2022; Watson et al., 2022). Thus, it is not surprising that a vast majority of the population were also in favor of Covid-19 vaccines.[3] Given this backdrop, getting vaccinated for Covid-19 can be viewed as a social norm that generates its own conformers and non-conformers, whose composition might be subject to political cues especially in a politically polarized context such as Turkey.

To investigate the Covid-19 vaccination as a social norm, the outgroup discrimination it generates, and ways to overcome it, we conduct a large-scale online survey experiment on a representative sample from Turkey. Turkey provides an ideal case study as the society is mainly divided into two political blocks, and voting shifts between the blocks are unlikely (Aydın-Düzgit and Balta, 2019; Somer, 2019).[4] In such polarized settings, previous work on norm enforcement suggests that it may be more challenging to enforce social norms because opposing groups perceive and treat each other poorly and hostilely (Herrmann et al., 2008; Van Bavel and Packer, 2021; Gelfand et al., 2022).

Our study starts with the elicitation of Covid-19 vaccination attitudes of respondents, i.e., which group they identify themselves with: With the group of those who distrust and oppose the vaccines (labelled as "anti-vaxxers" here), or of those who trust and support the vaccines (labelled "pro-vaxxers" here). We use one's attitude towards vaccination to create a natural group identity, which we refer to as the *vaccination group identity* (Charness et al., 2007). This group identity we employ in the first part of the experiment, where we ask each respondent to allocate 100 TL (Turkish Lira) between an anti- and pro-vaxxer person. Depending on the vaccination attitudes of the respondent, the difference between the allocated amount to anti- and pro-vaxxer person determines the outgroup bias of the respondent.

In the second part, using a between-subjects design, we compare a control group with the case where we randomly provide respondents with three different informational treatments about i) the economic costs of the pandemic, ii) the health burden of the pandemic, and iii) the threat of the Russia-Ukraine War to Turkey. The first two informational treatments aim to understand whether the outgroup hate stems from economic or health-related concerns. The third informational treatment, on the other hand, is designed to test whether a rally-around-the-flag intervention weakens existing salient group identities such as vaccination

[3]The share of population that was in favor of Covid-19 vaccines was 80% as of June 2021 reported by *Konda Araştırma ve Danışmanlık*, one of the well-established research companies in Turkey.

[4]According to the Varieties of Democracy (V-Dem) dataset by Coppedge et al. (2023) and Pemstein et al. (2023), the political polarization score of Turkey is even higher than those of the most polarized countries in the European Union –Hungary and Poland– and that of the US.

group identity (Baker and Oneal, 2001). To test the effectiveness of these informational treatments in altering outgroup discrimination, we measure outgroup bias once again using an income allocation task similar to the one in the previous part.

We conclude the study with a comprehensive survey on socio-demographic and socio-economic information, political party preferences, trust levels, and stances on several specific and salient policy issues. We use the information from this survey and the vaccination attitudes of respondents to test which characteristics predict identifying as anti-vaxxer, and analyze how political affiliations affect vaccine hesitancy and outgroup discrimination. The characteristics that we investigate are partisanship; trust in medicine, pharmaceuticals, state, government, or strangers; socio-economic and -demographic characteristics; and preferences in several salient policy issues.

In our sample, 20% of the respondents identify themselves as anti-vaxxer. Despite the existence of a significant anti-vaxxer group, they are very similar to pro-vaxxers in terms of observable characteristics. In fact, standard socio-economic and demographic characteristics do not differ between the two groups, and their preferences in several specific and significant policy issues are fully overlapping. This finding indicates that vaccine hesitancy does not stem from the existing social cleavages in the society. We note two differences, however. The more trust in medicine and pharmaceutical companies an individual has, the less likely they are an anti-vaxxer. Second, voters of the opposition block are more likely to be anti-vaxxers than incumbent block voters. This indicates that hesitancy towards Covid-19 vaccinations is at least partly driven by the current political polarization within the society.

Our findings on outgroup discrimination are consistent with the social contract interpretation of vaccination in previous studies (Korn et al., 2020; Weisel, 2021; Henkel et al., 2022; Bor et al., 2023). According to this, pro-vaxxers view vaccination as a social norm and regard anti-vaxxers as free-riders or violators of the social norm. Consequently, pro-vaxxers are especially expected to exhibit outgroup bias against anti-vaxxers. We show that both groups exhibit a significant amount of outgroup bias against the other. Specifically, pro-vaxxers allocate on average 60 TL less to anti-vaxxers when asked to divide 100 TL between an anti- and pro-vaxxer. Anti-vaxxers, on the other hand, allocate on average 40 TL less to pro-vaxxers. In other words, pro-vaxxers – who comply with the social norm and are willing to vaccinate – punish anti-vaxxers – who violate the social contract – more harshly than anti-vaxxers discriminate against conforming pro-vaxxers. This finding supports the perception of vaccination as a social contract by pro-vaxxers. Both groups exhibit significantly less outgroup bias when the income allocation task is repeated with group identities

formed based on birth months (minimal identity paradigm, Kranton et al., 2020).

We find that a significant portion of both anti- and pro-vaxxers believe that members of the other group vote for a different political party than their preferred one. These "politicized" individuals exhibit significantly more outgroup bias, providing evidence that people conflate existing political cleavages with new polarizing dimensions, such as vaccination attitudes. This conflation, in turn, may lead to more difficulties in dealing with the discrimination against the outgroups and in restoring the social norm.

Regarding our randomized informational treatments, we find that priming individuals with the economic cost or the health burden of the pandemic has limited effect on the outgroup bias exhibited by the respondents. This finding accords well with the argument that people already have the economic costs and health burden of the pandemic in mind when they make the money allocation decisions between anti- and pro-vaxxers. On the other hand, our informational treatment about the threat of the Russia-Ukraine War to Turkey leads to a significant reduction in the outgroup bias exhibited by pro-vaxxers against anti-vaxxers. This last finding suggests that promotion of other social identities (e.g., through a *rally-around-the-flag* effect as in this treatment) that are shared more broadly across groups might mitigate outgroup discrimination (Baker and Oneal, 2001).

This paper contributes to the literature on vaccine hesitancy and social norms by providing empirical evidence on the relationship between vaccination attitudes, outgroup discrimination, and political polarization. Prior research has established that pro-vaxxers view vaccination as a social norm and discriminate against anti-vaxxers. This paper adds to the discussion by documenting the role of political cues both in predicting social norm compliance and also in the extent of outgroup discrimination (Korn et al., 2020; Angerer et al., 2022; Henkel et al., 2022; Bor et al., 2023). This politicized nature of vaccination in turn presents challenges in enforcing vaccination as a social norm. This paper thus has broader implications for understanding how political polarization affects social norms and collective action in general. Other examples of phenomena that require compliance or coordination by large groups of people include environmental protection, public health measures, and social movements. In these contexts, political cues may also influence people's attitudes and behaviors, and create challenges for achieving social norm compliance or enforcement.

Moreover, the study enhances our knowledge of the factors that influence outgroup discrimination. We show that pro-vaxxers discriminate more against anti-vaxxers when they perceive a political gap between them and less when they perceive a political similarity.This complexity of outgroup discrimination poses a serious challenge in politically polarized set-

tings where people tend to associate any kind of difference with their outgroups with political divergence. This not only exacerbates the degree of outgroup discrimination but also makes it more resistant to interventions that aim to reduce it. However, we also demonstrate that an effective way to lessen such outgroup discrimination may be to foster a social identity that is more widely shared across groups, such as national identity.

The remainder of this paper is organized as follows. Section 2 provides the details regarding institutional setting and background. Section 3 describes our experimental design and sample characteristics. Section 4 discusses the results. Section 5 concludes.

2 Background and Institutional Setting

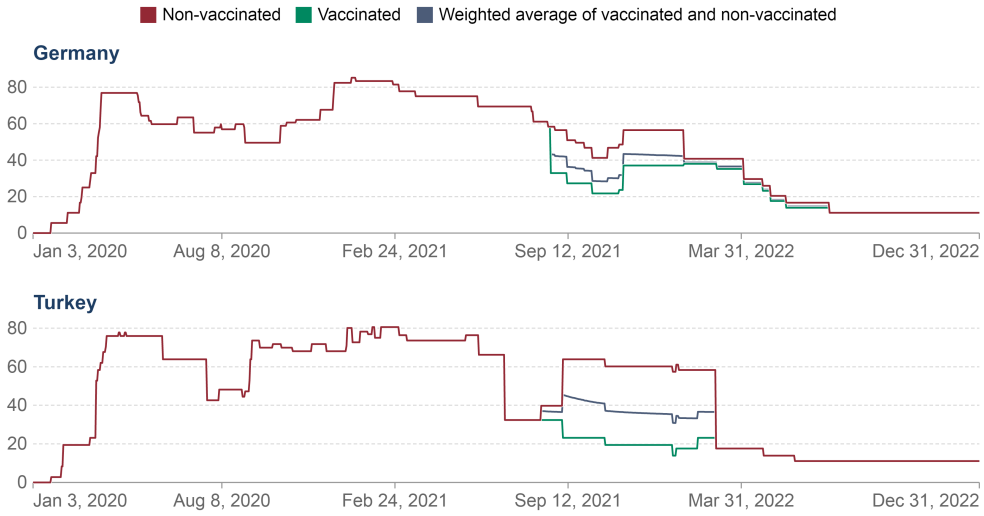
The waves of the pandemic in Turkey displayed patterns similar to those across the European Union, but at slightly lower magnitudes due to Turkey's relatively younger population (see Appendix Figures A.1 and A.2).[5] Counter-measures of the government ranged from local curfews to national level lock-downs in response to different waves of the pandemic, again, similar to the varying degree of strictness of the measures for example in Germany, as Figure 1 shows.[6] As vaccination became nationally available in Summer 2021, social distancing measures were gradually relaxed and by May 2022 when we started our survey, 85 percent of the adult population had received their second shots of vaccination and the restrictions were mostly removed. The high vaccination rates, young population, and robust public healthcare system contributed to a return to normalcy (Tank, 2020) by the time our survey was conducted.

The pandemic hit the Turkish economy when it was already experiencing a slowdown, resulting in a sharp contraction worsened by subsequent lockdown measures. The employment rate dropped to a 10-year low of 40.4 percent in April 2020, and domestic production shrank by 10.3 percent in the second quarter of that year. To mitigate the economic impact, the government introduced an economic stimulus package focused on supporting firms through tax breaks, financial aid, and employment-related measures. With the help of the national

[5]There have been suspicions regarding a possible under-reporting of the cases in official numbers from the very beginning (see for example Adiguzel et al., 2020; Laebens and Öztürk, 2022), however the alternative measures, such as excess deaths in Istanbul, have shown similar characteristics in terms of the timing of the waves of the pandemic.

[6]During the first wave from March to June 2020, the government closed schools, restricted travel, and imposed a curfew on weekends. In the second wave, which occurred between November 2020 and March 2021, the government implemented a partial curfew and restricted intercity travel. During the third wave from April to July 2021, the government implemented a full national-level lockdown, closing non-essential businesses and instituting a curfew.

Figure 1: Stringency Index of Covid-19 Measures, Turkey and Germany, 2020-2022



Notes: The stringency index is a composite measure based on nine response indicators including school closures, workplace closures, and travel bans, rescaled to a value from 0 to 100 (100 = strictest) (Hale et al., 2021).

vaccination program and loose monetary policies, the economy experienced a strong recovery. Annual growth rates were 1.8 percent in 2020, 11 percent in 2021, and 5.6 percent in 2022, but inflation reached a record high of 73.6 percent in May 2022. Unemployment also decreased from its peak of 14.2 percent in July 2020 to an average of 10.4 percent in June 2022 (Turkish Statistical Institute, 2023). Therefore, the negative economic effects of the pandemic were already partly mitigated when we have run our survey experiment.

In terms of political polarization, Turkey is recognized as one of the most politically and socially polarized countries, with polarization evident in political parties, voter preferences, and social distrust (Erdoğan, 2016; Erdoğan and Semerci, 2018; Aydın-Düzgit and Balta, 2019).[7] President Erdogan and his party, the Justice and Development Party (AKP), have utilized polarization to consolidate power and allocate resources to their supporters since 2002 (Somer, 2019). However, these strategies altered both the party and the political landscape in a way that both the AKP and its adversaries were similarly trapped by this split in antidemocratic speech and policies. In other words, the polarizing attitude is not specific to AKP supporters; the opposition supporters have been reacting to the government

[7]In 2015, Turkish politics was the most polarized among the thirty-eight countries included in the Comparative Study of Electoral Systems (CSES) data (Erdoğan and Semerci, 2018). More recently, Erdoğan (2016) and Laebens and Öztürk (2021) suggest alarming levels of polarization in 2016 and 2018, respectively. V-Dem dataset also lists Turkey as one of the most politically polarized countries (Coppedge et al., 2023; Pemstein et al., 2023).

policies and programs in a similarly polarized way.

Regarding the COVID-19 pandemic though, the Turkish government acted in a rather technocratic way, avoiding any attempts to politicize the crisis or frame it within populist narratives. Analyzing President Erdogan's speeches throughout the pandemic, Laebens and Öztürk (2022) shows that he refrained from linking the pandemic to any perceived conflicts as some other populist leaders, such as Bolsonaro, did. Instead, Erdogan framed it as a global health crisis, acknowledging it as "the biggest crisis humankind was faced with in modern times". This approach, coupled with a narrative of success, initially boosted Erdogan's approval ratings. Although these ratings decreased later as the government's handling of the crisis became inconsistent, many Turkish citizens, including some in the opposition, still considered the government's COVID-19 policies successful by the end of 2021 (Laebens and Öztürk, 2022).

3 Experimental Design

We conducted our experiment in May and June 2022 in collaboration with Twentify, a survey firm specialized in conducting survey studies in Turkey. 2815 participants were recruited that are representative for Turkey with respect to age, socio-economic status, gender, and vaccination status.[8] Participants completed the study online, which took 15 minutes on average, and they received a payment of 72 Turkish Liras (TL) on average (equivalent to $4.4 or 2.7 hours of minimum wage at the time). From all choice tasks, one random choice was implemented for payment with a 10% chance, that is, we implemented a choice for every tenth participant.

Before any experimental game was played, we elicited participant's identification as anti- or pro-vaxxer together with information about their vaccination status. Moreover, we asked about birth dates to be able to form groups additionally based on a minimal identity paradigm – besides vaccination attitudes.[9]

3.1 First Measurement of Outgroup Bias: Allocation Tasks

For the first measurement of outgroup bias, we implemented a sequence of four tasks. The first block of tasks comprises two third-party allocation tasks. In the first of these two tasks,

[8] In terms of vaccination status, we targeted the share of people with two doses of vaccination in the population (85%) as two doses were regarded as full vaccination at the time.

[9] See Appendix A.3.1 for the exact wording and the full pre-experimental survey.

participants had to allocate 100 TL, in steps of 20 TL, between an unknown participating person from the anti-vaxx group and an unknown participating person from the pro-vaxx group. In the second of these two tasks, the allocation had to be carried out between a person born in the same month as the participant and a person born in a different month than the participant. These two tasks build the first block of tasks. In the second block, participants were asked to allocate 100 TL, again in steps of 20 TL, once between themselves and an anonymous participant from the anti-vaxx group, and once between themselves and an anonymous participant from the pro-vaxx group.

We randomized the order in which the blocks were played, as well as the order in which the tasks within each block were played. The other persons in the allocation tasks were chosen from the same income group as the participant, which we communicated to participants, in order to rule out any welfare considerations by the respondents.

Using the first task of the first block, we measure outgroup discrimination by the difference between the allocated amounts to the ingroup and the outgroup participants, where the outgroup is from the anti-vaxx (pro-vaxx) group if the participant is from the pro-vaxx (anti-vaxx) group. The two tasks in the second block provide an alternative measure of outgroup discrimination. Each task asks respondents to allocate 100 TL between themselves and an ingroup or outgroup person. The difference between the allocated amounts to ingroup and outgroup participants in these two tasks yields an alternative measure of outgroup discrimination. However, in the latter, self-interest is involved, while in the former –the third-party allocation tasks based on vaccination attitudes– self-interest plays no role. Ruling out the motive of self-interest enables us to detect outgroup discrimination that is otherwise masked by self-interest motives since some respondents selfishly allocate all the income to themselves regardless of the identity of their matched partner.

By design, we have ruled out the possibility to allocate equal amounts of money to both persons in all allocation tasks. This forces participants to exhibit a preference for one of the partners or themselves, but given that participants favor equal splits independently of any fairness concern (Güth et al., 2001), allowing such equal splits would result in blurring our measure of discrimination. Moreover, this design choice allows to abstract form social image concerns that would arguably push participants to choose the equal split.

3.2 Treatments to Alter Outgroup Bias

After the first measurement of outgroup bias, we administer three informational treatments plus one control treatment in a between-subject design. The treatments inform about (i)

the death toll and health burden of the pandemic to the public (HEALTH INFO treatment),[10] (ii) the economic costs of the pandemic (ECONOMIC INFO treatment),[11] and (iii) the fatalities and displacements due to Russia's aggression against Ukraine, mentioning that Turkey implemented the Montreux Convention regarding the Straits (*the Montreux Convention*), thereby making salient how Turkey is affected by the conflict (WAR INFO treatment).[12] The Montreux Convention grants Turkey a full authority on regulating maritime traffic through the Turkish straits at times of war or when it feels itself threatened by a war.[13] This last informational treatment allows us to study whether a rally-around-the-flag intervention (Baker and Oneal, 2001) weakens the existing salient group identities, such as vaccination or political identity, and helps to put these in perspective.

All of these treatments could either reduce or aggravate outgroup discrimination or be ineffective in changing discrimination levels. Should a treatment increase outgroup discrimination, it would suggest that the highlighted aspect might be a root cause of outgroup bias in the first place. In case outgroup discrimination is decreased by one of the first two treatments, it might suggest that making the burden to society salient might trigger the insight that the problem can only be overcome by a collective effort which in turn might help to unify society. Likewise, if the WAR INFO treatment reduces outgroup discrimination, it suggests that promotion of a shared identity ('compatriotism' in this case) across groups is an effective way of mitigating outgroup discrimination.

3.3 Post-Treatment Measurement of Outgroup Bias: Pool Allocation Task

To test whether the informational treatments, implemented in a between-subject design, are effective in changing the outgroup discrimination, that is, in affecting polarization along vaccination attitudes, we again measure outgroup discrimination before the post-experimental

[10] Specifically, we wrote "According to official statistics, the Covid-19 pandemic has so far claimed the lives of nearly 100,000 Turkish citizens and sickened around 15 million people."

[11] The exact wording was "The Covid-19 pandemic is estimated to have reduced total production in Turkey by around 20 percent in the last two years and caused nearly 3 million people to lose their jobs."

[12] The wording that we used was "It is estimated that 15 thousand people lost their lives in the first three weeks of Russia's aggression against Ukraine and nearly 3 million people were forced to migrate to other countries. During this war, Turkey implemented the Montreux Straits Convention."

[13] One of the main issues that concerned the Turkish public during the war was the status of the Montreux Straits Convention, which regulates the passage of naval vessels through the straits. This is evident from the spike in Google searches for "Montreux Straits Convention" that occurred shortly before our study, right after the hostilities began.

survey.[14] We employ two allocation tasks similar to the ones in the first part. Participants are again matched with another participant in both tasks. In one of the two tasks, the other participant is from the same group with respect to vaccination attitudes, and in the other one, the person is from the other group. The order of the tasks is randomized.

Participants are endowed with 100 TL, and they can send between 0 and 100 TL (in steps of 20 TL) to their partner. This amount is doubled by us, and paid to the partner (in addition to what they kept for themselves) in case this task is payout relevant. Similarly, the partner has the same option; that is, the task is a modified public goods game. The measure of outgroup discrimination resulting from these two tasks is obtained by subtracting the amount given to the outgroup partner from the amount given to the ingroup partner.

3.4 Post-Experimental Survey

The experiment concludes with a detailed survey on socio-demographic and socio-economic information, political party preferences, trust levels, and stances on several specific and salient policy issues. See Appendix A.3.2 for the full post-experimental questionnaire.

4 Results

In this section, we first explore the predictors of identifying with the group of anti-vaxxers. Second, we report our results regarding the outgroup bias based on vaccination attitudes and how political polarization aggravates this bias. Finally, through informational treatments, we investigate the malleability of the outgroup discrimination based on vaccination group identity.

4.1 Predicting an anti-vaxxer group identity

We have four sets of potential factors that might be predictive of identifying as anti-vaxxer. Specifically, we focus on the role of i) socio-demographic and socio-economic characteristics of the respondent, ii) attitudes and preferences of the respondent in several policy-relevant issues, iii) trust levels of the respondents (in medicine, pharmaceuticals, state, government, or strangers), and finally, iv) the preferred political party. In all regressions where we investigate

[14] To reduce the impact of cognitive biases on the respondents' judgments, we have slightly changed the task. These biases include the desire for consistency or the anchoring effect, which can make the respondents' subsequent answers depend on their choice in the first task.

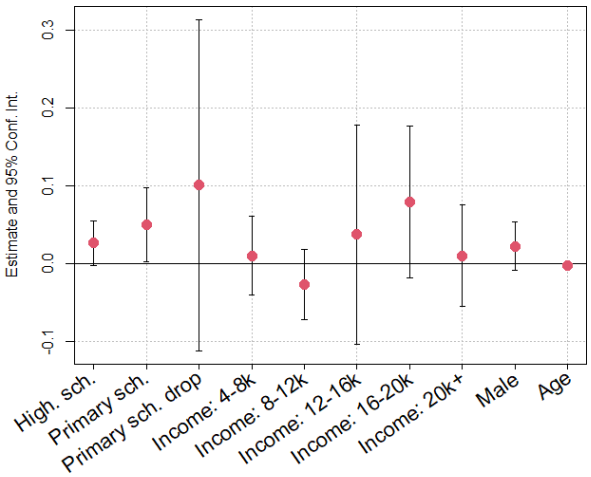
the role of potential predictors, we control for NUTS-1 level region fixed effects (highest administrative subdivision) and cluster the standard errors at the NUTS-1 level.

Econometrically, to explore the role of socio-demographic and socio-economic characteristics – point i) above – we estimate the following specification using OLS:

$$\text{Anti-vaxxer}_i = \beta_0 + \beta_1 \cdot \text{Education}_i + \beta_2 \cdot \text{Income}_i + \beta_3 \cdot \text{Gender}_i + \beta_4 \cdot \text{Age}_i + \beta_5 \cdot \text{Region}_i + \epsilon_i. \quad (1)$$

Figure 2 reports the results. The coefficient estimates on education level variables indicate how likely or unlikely a respondent with the corresponding education level is an anti-vaxxer compared to a respondent with a college degree, which is the reference level of the education variable. Similarly, the reference level for the income variable is *Income: 0-4k*, indicating income levels up to 4000 TL monthly. Among several socio-demographic and socio-economic characteristics, we do not find any strong predictor of anti-vaxx group membership. The only statistically significant estimate is for the respondents with only primary school education. These respondents are 5% more likely to be an anti-vaxxer compared to respondents with a college degree.

Figure 2: Predictors of anti-vaxxers: socio-demographic and socio-economic characteristics



Notes: The figure reports the coefficient estimates obtained from the OLS regression of identifying with anti-vaxxer group on education, income, gender, age, and NUTS-1 fixed effects. The baseline levels for education and income variables are, respectively *College education* and *Income: 0-4k*. The 95% confidence intervals are based on the standard errors clustered at the NUTS-1 level.

We now turn to respondents' economic and social policy preferences, their trust levels,

and their preferred political party as potential predictors of attitudes toward vaccination. Our common econometric specification for these analyses is:

$$\text{Anti-vaxxer}_i = \beta_0 + \boldsymbol{\beta_1} \cdot \mathbf{X}_i + \boldsymbol{\beta_2} \cdot \mathbf{Z}_i + u_i, \tag{2}$$

where $\mathbf{X}_i$ is a vector capturing either respondents' economic policy preferences, their social policy preferences, their trust levels or their preferred political party, depending on the analysis. $\mathbf{Z}_i$ is a battery of controls comprising of education, income level, gender, age, and region of residence.

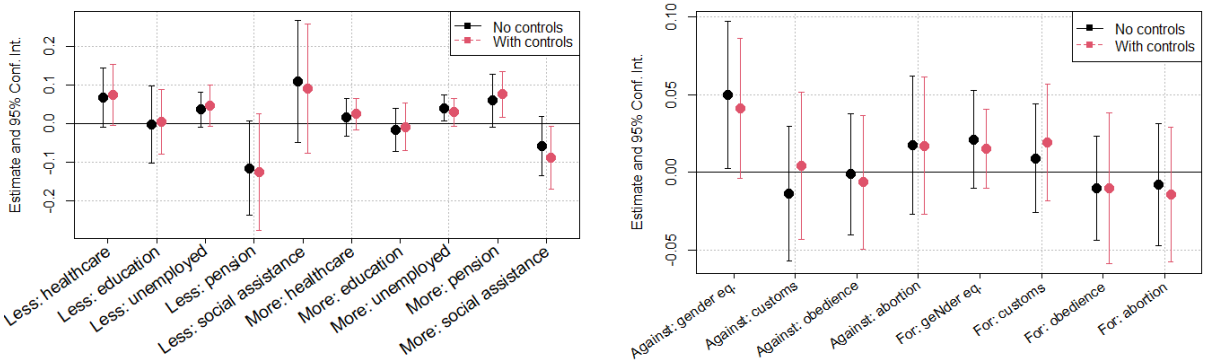
Figure 3 reports whether respondents' preferences in several policy-relevant economic and social issues predict their attitudes towards vaccination. The policy issues we include in this analysis are typically the issues that polarize the electorate in Turkey. In Figure 3a, we investigate whether respondents' preferences over various types of government spending predict their vaccination attitudes. For example, we report whether preferring more or less government spending for the healthcare system than the current amount of spending is a predictor of vaccination attitudes compared to respondents who prefer the current level. The variables on other government spending types enter the analyses analogously.

Similarly, in Figure 3b, we focus on the role of social issues in predicting vaccination attitudes. For example, we investigate whether attitudes towards abortion are associated with vaccination attitudes. Specifically, we report whether respondents who are for or against abortion are more or less likely to be an anti-vaxxer compared to people who are indifferent about the abortion right.

Summarizing both analyses, we do not find any statistically significant predictor of vaccination attitudes. Moreover, for many of the policy issues, we obtain a precise null estimate. This finding suggests that the polarization in vaccination attitudes does not align with the existing political cleavages in the society but appears to be a rather new polarizing issue.

Finally, using Eq. (2), we investigate whether trust levels and the preferred political party of the respondents predict their anti-vaxx group identity. Figure 4a reports the estimates regarding the trust level of respondents in medicine, pharmaceuticals, state, government, and strangers. We report whether a respondent who distrusts or trusts in a certain institution is more or less likely to be an anti-vaxxer compared to a respondent who is indecisive. Perhaps not surprisingly, our results indicate that people who have distrust (trust) in medicine and pharmaceuticals are more (less) likely to be an anti-vaxxer compared to indecisive respondents. The corresponding coefficients range from -11% to 13%. Interestingly, we find that trust in the government or the state does not predict vaccination attitudes although

Figure 3: Predictors of anti-vaxxers: economic and social policy preferences



(a) Government spending

(b) Social policies

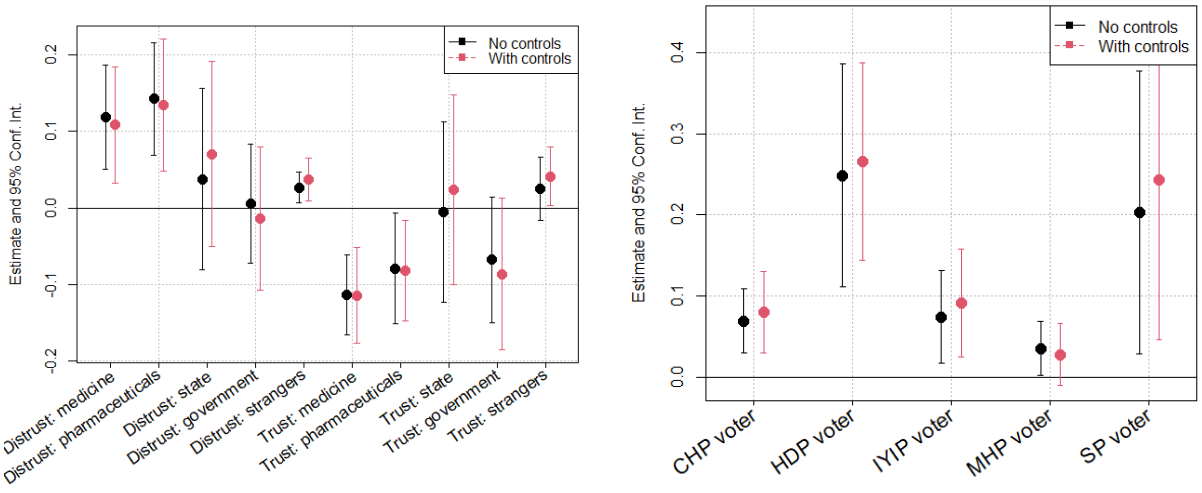
Notes: Panel (a) and (b) plot the coefficients estimates obtained from the OLS regressions of identifying with anti-vaxxer on preferences in government spending in Panel (a) and preferences in social policies in Panel (b), controlling only for NUTS-1 fixed effects in the *No controls* specifications and controlling for education, income, gender, age, and NUTS-1 fixed effects in the *With controls* specifications. In Panel (a), the baseline level for each type of spending is *Same as now*. The levels with *Less:* and *More:* then indicate the contrast with this reference level. In Panel (b), the baseline level for each policy preference is indifference. The levels with *Against:* and *For:* then indicate the contrast with this reference level. 95% confidence intervals are based on the standard errors clustered at the NUTS-1 level.

the entire vaccination program has been implemented by the government using the state capacity.

More interestingly, in Figure 4b, we document that respondents' preferred political party has at least a comparable effect to that of distrust in medicine and pharmaceuticals. We find that opposition voters, such as CHP, HDP, IYIP and SP voters, are respectively 8%, 27%, 9%, and 24% more likely to be anti-vaxxer compared to an AKP (*Adalet ve Kalkınma Partisi,* Erdogan's incumbent party) voter.[15] MHP (*Milliyetçi Hareket Partisi*, AKP's ally party) voters, on the other hand, do not differ from AKP voters in their vaccination attitudes. These findings reveal the politicized nature of Covid-19 vaccination and illustrate that the successful enforcement of the social norm of vaccinating is challenged by the political polarization among the society.

[15]The voters who oppose the government represent a wide range of political views. CHP (*Cumhuriyet Halk Partisi*) represents more the secular part of Turkey. HDP (*Halkların Demokratik Partisi*) voters typically comprise of Kurdish people. IYIP (*İyi Parti*) represents the secular but also more nationalistic part of Turkey. Finally, SP (*Saadet partisi*) represent the more Islamic voters that are not aligned with AKP. The common denominator of these parties is their opposition to the AKP-MHP block.

Figure 4: Predictors of anti-vaxxers: trust levels and preferred political party



(a) Trust levels

(b) Preferred political party

Notes: Panel (a) and (b) plot the coefficients estimates obtained from the OLS regressions of identifying with anti-vaxxer on trust variables in Panel (a) and preferred political party in Panel (b), controlling only for NUTS-1 fixed effects in the *No controls* specifications and controlling for education, income, gender, age, and NUTS-1 fixed effects in the *With controls* specifications. In Panel (a), the baseline level for each trust variable is *Indecisive*. The levels with *Distrust:* and *Trust:* then indicate the contrast with this reference level. In Panel (b), the baseline level is *AKP*. The levels with *Against:* and *For:* then indicate the contrast with this reference level. 95% confidence intervals are based on the standard errors clustered at the NUTS-1 level.

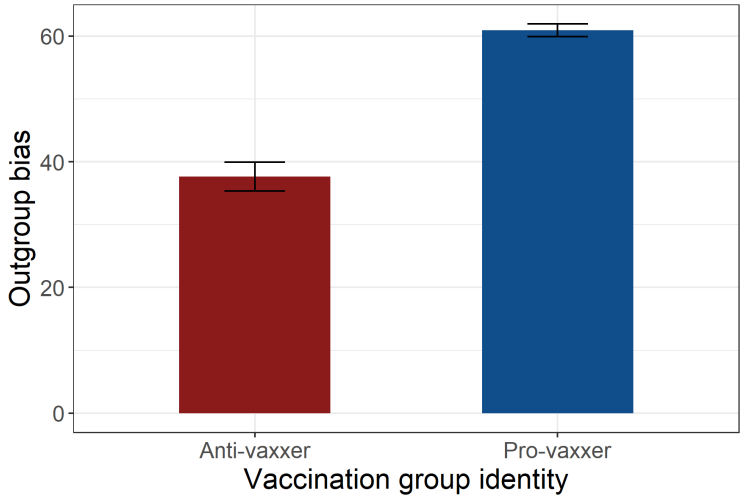
4.2 Outgroup discrimination and political polarization

In this section, we first report our results regarding the outgroup bias of the pro- and anti-vaxxer groups against each other. This social norm interpretation of vaccination implies that pro-vaxxers regard anti-vaxxers as violators or free-riders, which results in a "punishment" of the anti-vaxxers by them. To quantify this, we measure the outgroup bias by asking respondents to allocate 100 TL between an anti- and pro-vaxxer participant. The difference between the allocated amounts is the outgroup bias of the respondent, and the bias expressed by the pro-vaxxers should be higher to be in line with the social contract interpretation (Korn et al., 2020; Weisel, 2021; Henkel et al., 2022; Bor et al., 2023).

Figure 5 reports the outgroup bias of the two groups against the other. Consistent with a social contract interpretation of the Covid-19 vaccinations, we find that pro-vaxxers allocate on average 60 TL less to anti-vaxxers when they are asked to allocate 100 TL between an

anti- and pro-vaxxer. This means that on average pro-vaxxers allocate 80 TL to another pro-vaxxer, but only 20 TL to an anti-vaxxer. The outgroup bias of anti-vaxxers against pro-vaxxers on the other hand is smaller but still substantial. They allocate on average 40 TL less to pro-vaxxers when they are asked to divide 100 TL between an anti- and pro-vaxxer, thus they allocate on average 70 TL to anti-vaxxers, and 30 TL to pro-vaxxers. The outgroup bias of anti-vaxxers against pro-vaxxers can be explained by the backlash against poor treatment by pro-vaxxers and the restrictions imposed by the government on the unvaccinated (Henkel et al., 2022). Overall, we find that both groups exhibit substantial amount of outgroup bias against each other even in times when the effects of the pandemic were relatively mild.[16]

Figure 5: Outgroup bias based on vaccination attitudes



Notes: The figure depicts the outgroup bias shown by anti-vaxxers (pro-vaxxers) against pro-vaxxers (anti-vaxxers) measured using a third-party money allocation task, in which anti- and pro-vaxxers allocate 100 TL between an anti- and a pro-vaxxer. The bars correspond to the standard errors.

The outgroup bias that we measure is not solely driven by general groupy tendencies of the respondents (Kranton et al., 2020). When we ask respondents to allocate 100 TL between two persons with the same birth month as the respondent and with a different birth month from the respondent, we observe substantially smaller degrees of outgroup bias. Anti-

[16]We also measure outgroup bias in vaccination attitudes using the two income allocation tasks that include self-interest: self vs. anti-vaxxer and self vs. pro-vaxxer. The difference between the amounts that the respondents kept to themselves yields another measure of outgroup bias. Figure A.3 reports these results. Consistently with the first outgroup bias measure, we find that pro-vaxxers exhibit more outgroup bias than anti-vaxxers. However, average outgroup bias levels are substantially lower in this case because the respondents' incentive to keep the money for themselves masks their underlying outgroup bias, which is evident from the first outgroup bias measure.

vaxxers allocate on average 26 TL less to people who have different birth months from theirs, while pro-vaxxers allocate on average 21 TL less (see Appendix Figure A.4). Thus, even the ranking changes in the sense that for this group identity the anti-vaxxers turn out to be more "groupy" than the pro-vaxxers. Moreover, we test the relationship between outgroup bias based on vaccination attitudes and based on minimal identity in a regression (see Appendix Table A.2): A 10 TL increase in the outgroup bias in minimal identity is associated with a 0.6 TL increase in the outgroup bias in vaccination attitudes. Although this association is statistically significant, as groupy tendencies obviously matter, it cannot explain even the smallest bias due to vaccination attitudes (40 TL) that we report: The highest possible outgroup bias in the minimal identity treatment is 100 TL, which would result in a predicted 6 TL higher outgroup bias in vaccination attiudes. This concludes that what we measure as outgroup bias in vaccination attitudes is distinct from the general groupy tendencies of the respondents.

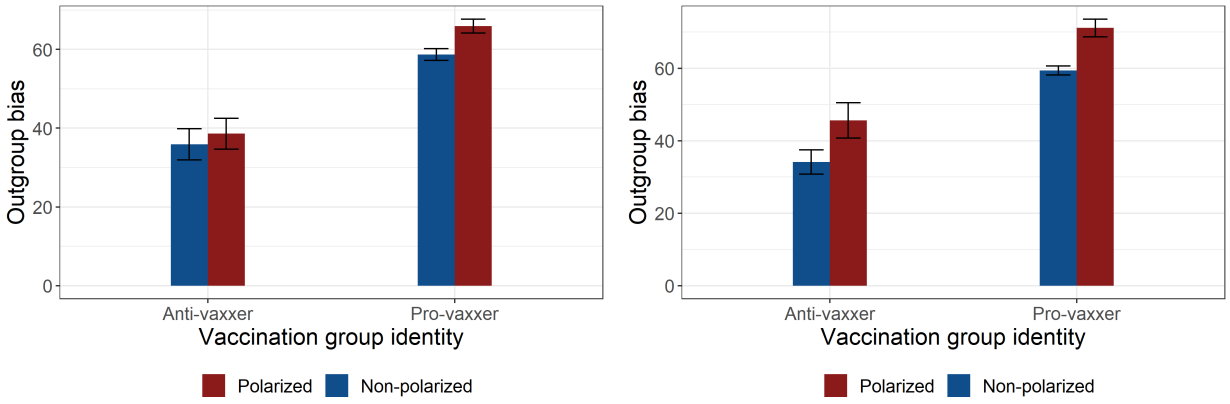
Finally, we investigate how the political polarization affects the outgroup bias levels of the respondents. To do so, we use the beliefs of respondents about the political party their outgroup votes for. In other words, we ask anti-vaxxers which party they think the pro-vaxxers vote for and vice versa. Using this information, we identify polarized individuals in two ways. First, we consider any respondent who thinks that their outgroup votes for a different political party from their own as polarized. We call this *weak polarization* as voters are not uniformly and equally against all the other political parties –they might actually be sympathetic towards some political parties. Second, we consider any respondent who votes for the ruling AKP and who believes that their outgroup votes for the main opposition party, CHP, and vice versa, as polarized. We call it *strong polarization*, as this is the main polarizing dimension in Turkey.

Figure 6 reports the result regarding the effects of political polarization on outgroup bias based on vaccination attitudes. Under the weak polarization definition, we find that polarized pro-vaxxers, i.e., the pro-vaxxers who think that anti-vaxxers vote for a political party different from their preferred one, exhibit 12% more outgroup bias than non-polarized pro-vaxxers. Polarized anti-vaxxers, on the other hand, do not statistically differ from non-polarized anti-vaxxers, although they exhibit 8% more outgroup bias than non-polarized anti-vaxxers (Figure 6a). The results get much stronger when we increase the degree of political polarization by focusing on the voters of the two major competing parties: AKP vs. CHP. Figure 6b shows that polarized pro-vaxxers exhibit 20% more outgroup bias than non-polarized pro-vaxxers, while polarized anti-vaxxers show 33% more outgroup bias than

non-polarized anti-vaxxers.

Overall, these findings corraborate the politicized nature of the Covid-19 pandemic, adding a political polarization layer to the polarization layer based on vaccination attitudes. This combination however makes it difficult to overcome polarization evoked by the Covid-19 vaccine, which we investigate in the next section.

Figure 6: Outgroup bias based on vaccination identity and political polarization



(a) Weak polarization

(b) Strong Polarization

Notes: The figure depicts the outgroup bias shown by anti-vaxxers (pro-vaxxers) against pro-vaxxers (anti-vaxxers) measured using a third-party money allocation task, in which anti- and pro-vaxxers allocate 100 TL between an anti- and a pro-vaxxer. Panel (a) and (b) report breakdowns of outgroup bias by anti- and pro-vaxxers, respectively, based on their status in weakly- and strongly-defined polarization. Weakly-polarized indicates the respondents who believe their outgroup vote for a different political party from theirs. Strongly-polarized indicates the respondents who believe their outgroup votes for *AKP* (*CHP*) if they voted for *CHP* (*AKP*). The bars correspond to the standard errors.

4.3 Randomized informational treatment

Before concluding, we explore the malleability of the outgroup discrimination based on vaccination attitudes using three informational treatments. Using a within-subject design, we randomly inform respondents about either (i) the death toll and health burden of the pandemic to the public (Health Info treatment), or (ii) the economic costs of the pandemic (Economic Info treatment), or (iii) the fatalities and displacements due to Russia's aggression against Ukraine, mentioning that Turkey implemented the Montreux Straits Convention to communicate how Turkey is affected by the conflict (War Info treatment).

We measure post-treatment outgroup bias in vaccination attitudes using two modified public goods games (ses Section 3.3), and the difference between the allocated amounts to

anti- and pro-vaxxers in the two games yields the post-treatment outgrup bias in vaccination attitudes. To estimate the effects of informational treatment on outgroup bias, we compare respondents who receive informational treatment to a control group that has not been treated with any kind of information. Econometrically, we estimate the following specification:

$$\text{Post-treatment outgroup bias} = \beta_0 + \beta_1 \cdot D_i + \beta_2 \cdot \text{Baseline bias} + \beta_3 \cdot \mathbf{Z}_i + \psi_i, \qquad (3)$$

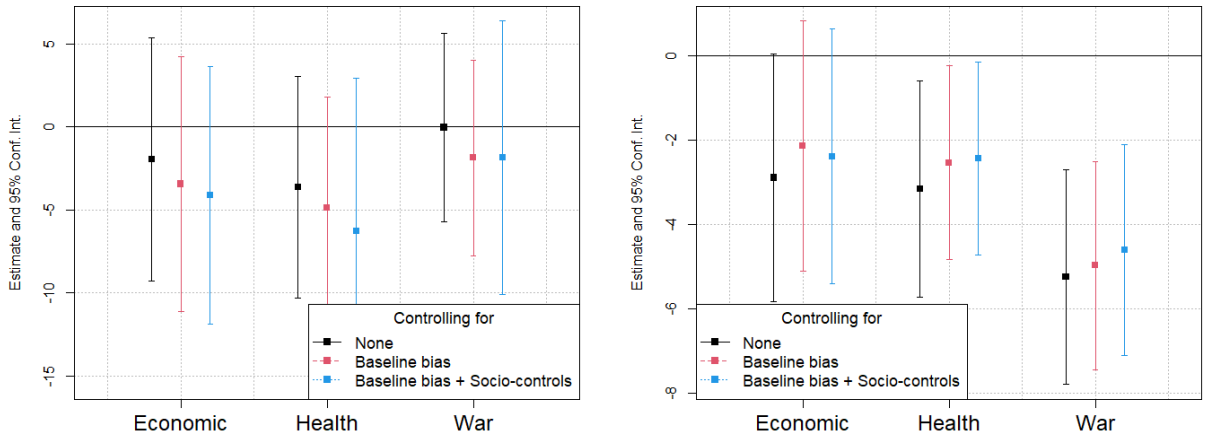
where D_i indicates the type of informational treatment received by participant i. The reference level of this variable is chosen as the control group. $\mathbf{Z}_i$ is again a battery of controls including education and income level of the respondents, and their gender and age. Figure 7a and 7b present the effects of informational treatments on the outgroup bias levels of, respectively, anti- and pro-vaxxers. We estimate three specifications for each group. In the first specification we only control for NUTS1 level region fixed effects. Second, we also control for the baseline bias, i.e., the pre-treatment measurement of outgroup bias based on vaccination attitudes. Third, in addition to the NUTS1 level region fixed effects and baseline bias, we also control for the socio-demographic and socio-economic variables. In all specifications, we cluster the standard errors at the NUTS1 level.

For the group of anti-vaxxers, we find that none of the informational treatments seems to affect the outgroup bias against the pro-vaxxers. For the group of pro-vaxxers, only the information on the adverse economic effects of the pandemic (Economic Info treatment) does not seem to move outgroup bias levels.

The Health Info and War Info treatments reduce the outgroup bias of pro-vaxxers significantly. Pro-vaxxers who are reminded of the health burden of the pandemic allocate on average 3 TL or 12% more to anti-vaxxers compared to the pro-vaxxers in the control group. Pro-vaxxers who are reminded of Russia's aggression against Ukraine and its implied effect on Turkey show the greatest treatment effects. Our estimates indicate that the War Info treatment significantly reduces the outgroup bias of pro-vaxxers against anti-vaxxers by 5 TL or 21% compared to the pro-vaxxers in the control group.

Overall, these results show that for anti-vaxxers, the outgroup bias is less malleable through informational treatments than for pro-vaxxers. Pro-vaxxers in turn who are informed about an external threat (be it the Covid-19 virus or the military aggression by Russia) exhibit less bias against their outgroups. It is noteworthy that this is not a mechanical result caused by the smaller scope for the treatments or by the smaller discrimination levels among the anti-vaxxers, since the patterns of treatment effects are rather distinct, in particular for the War Info treatment.

Figure 7: Treatment effects on outgroup bias: anti- and pro-vaxxers



(a) Anti-vaxxers

(b) Pro-vaxxers

Notes: Panel (a) and (b) plot the estimated treatment effects obtained from the OLS regressions of outgroup bias on treatment variable for anti-vaxxers in Panel (a) and for pro-vaxxers in Panel (b), controlling only for NUTS-1 fixed effects in the *None* specifications, controlling for baseline bias and NUTS-1 fixed effects in the *Baseline bias* specifications, and controlling for baseline bias, education, income, gender, age, and NUTS-1 fixed effects in the *Baseline bias + Socio-controls* specifications. The treatment variable is a categorical variable with four levels: Control, Health Info, Econ Info, and War Info where Control is the baseline level. 95% confidence intervals are based on the standard errors clustered at the NUTS-1 level.

The large effects of War Info treatment for the pro-vaxxers suggest that the promotion of social identities that are shared across groups – such as compatriotism as in this treatment – might be an effective way to mitigate outgroup discrimination, as it seems to help to put the violation of the social contract of vaccination into perspective. Treatments that are related to the perceived breech of the social contract are less powerful in this aspect.

5 Conclusion

The Covid-19 pandemic has posed unprecedented challenges for public health and social cohesion around the world. While vaccines offer a promising solution to end the crisis, their effectiveness depends on the willingness of people to get vaccinated. Yet, vaccination decisions are not only influenced by individual health considerations but also by social norms and political factors. In this paper, we have investigated how political affiliation and polarization

shape vaccination attitudes and vaccination-related discriminatory behavior in a large-scale representative survey experiment in Turkey. To interpret our results, we have used a social norm framework for vaccination attitudes, which focused on the conformers to –pro-vaxxers– and violators –anti-vaxxers– of the social norm, and the interaction between the two groups.

We have first identified the characteristics of pro- and anti-vaxxers in our sample and shown that political affiliation is a strong predictor of vaccination intentions even after controlling for other socio-demographic variables. We have then used standard economic games to measure the extent of outgroup discrimination between the two groups. We have found that pro- and anti-vaxxers discriminate each other substantially, indicating considerable polarization in vaccination attitudes. Moreover, we have shown that this polarization is exacerbated when pro- and anti-vaxxers perceive a political difference between them and attenuated when they perceive a political similarity. These results suggest that social norms regarding vaccination and their enforcement are affected by political affiliations and polarization even during a health crisis as severe as Covid-19.

Finally, we have explored the potential of informational treatments to mitigate the outgroup bias caused by the vaccines. We have randomly exposed our respondents to messages that emphasize either a common social identity (national identity) or the economic cost and public health burden of the Covid-19 pandemic before measuring outgroup discrimination for the second time. We have found that the promotion of a common social identity reduces the outgroup bias between pro- and anti-vaxxers substantially, while the information on the public health burden of the pandemic has milder effects. These results imply that fostering a sense of shared belonging and solidarity might help overcome the polarization in vaccination attitudes and behaviors.

Our findings have important implications for designing effective public health campaigns and promoting social harmony in the context of a global pandemic. Our paper contributes to the literature on social norms, political polarization, and vaccination behavior by providing novel evidence from a large-scale survey experiment in a politically polarized setting. We hope that our paper will stimulate further research on the social and political aspects of vaccination decisions and encourage policy makers to adopt strategies that leverage social norms and identities to increase vaccine uptake and reduce polarization.

References

Adiguzel, F. S., Cansunar, A., and Corekcioglu, G. (2020). "Truth or Dare? Detecting Systematic Manipulation of COVID-19 Statistics". In: *Journal of Political Institutions and Political Economy* 1.4, pp. 543–557.

Angerer, S., Glätzle-Rützler, D., Lergetporer, P., Rittmannsberger, T., et al. (2022). *Beliefs about Social Norms and (the Polarization of) COVID-19 Vaccination Readiness*. Tech. rep.

Aydın-Düzgit, S. and Balta, E. (2019). "When Elites Polarize Over Polarization: Framing the Polarization Debate in Turkey". In: *New Perspectives on Turkey* 60, pp. 153–176.

Baker, W. D. and Oneal, J. R. (2001). "Patriotism or Opinion Leadership? The Nature and Origins of the "Rally'round the Flag" Effect". In: *Journal of Conflict Resolution* 45.5, pp. 661–687.

Balafoutas, L. and Nikiforakis, N. (2012). "Norm Enforcement in the City: A Natural Field Experiment". In: *European Economic Review* 56.8, pp. 1773–1785.

Balafoutas, L., Nikiforakis, N., and Rockenbach, B. (2014). "Direct and Indirect Punishment among Strangers in the Field". In: *Proceedings of the National Academy of Sciences* 111.45, pp. 15924–15927.

Barro, R. J. (2022). "Vaccination Rates and COVID Outcomes across US States". In: *Economics & Human Biology* 47, p. 101201.

Bernheim, B. D. (1994). "A Theory of Conformity". In: *Journal of Political Economy* 102.5, pp. 841–877.

Bicchieri, C. (2005). *The Grammar of Society: The Nature and Dynamics of Social Norms*. Cambridge University Press.

Bicchieri, C. and Dimant, E. (2022). "Nudging with Care: The Risks and Benefits of Social Information". In: *Public Choice* 191.3-4, pp. 443–464.

Bicchieri, C., Dimant, E., Gaechter, S., and Nosenzo, D. (2022). "Social Proximity and the Erosion of Norm Compliance". In: *Games and Economic Behavior* 132, pp. 59–72.

Bor, A., Jørgensen, F., and Petersen, M. B. (2023). "Discriminatory Attitudes against Unvaccinated People during the Pandemic". In: *Nature* 613.7945, pp. 704–711.

Charness, G., Rigotti, L., and Rustichini, A. (2007). "Individual Behavior and Group Membership". In: *American Economic Review* 97.4, pp. 1340–1352.

Cialdini, R. B., Reno, R. R., and Kallgren, C. A. (1990). "A Focus Theory of Normative Conduct: Recycling the Concept of Norms to Reduce littering in public places." In: *Journal of Personality and Social Psychology* 58.6, p. 1015.

Cooper, D. J. and Weber, R. A. (2020). "Recent Advances in Experimental Coordination Games". In: *Handbook of Experimental Game Theory*, pp. 149–183.

Coppedge, M. et al. (2023). *V-Dem Country-Year Dataset v13*. DOI: https://doi.org/10.23696/vdemds23.

Erdoğan, E. (2016). "Turkey: Divided We Stand". In: *On Turkey* 118, pp. 1–4.

Erdoğan, E. and Semerci, P. U. (2018). *Dimensions of Polarization in Turkey*. Tech. rep. Istanbul Bilgi University Center for Migration Research Report.

Fehr, E. and Gächter, S. (2000). "Cooperation and Punishment in Public Goods Experiments". In: *American Economic Review* 90.4, pp. 980–994.

Fehr, E. and Schurtenberger, I. (2018). "Normative Foundations of Human Cooperation". In: *Nature Human Behaviour* 2.7, pp. 458–468.

Gächter, S. and Herrmann, B. (2011). "The Limits of Self-governance when Cooperators Get Punished: Experimental Evidence from Urban and Rural Russia". In: *European Economic Review* 55.2, pp. 193–210.

Gelfand, M., Li, R., Stamkou, E., Pieper, D., Denison, E., Fernandez, J., Choi, V., Chatman, J., Jackson, J., and Dimant, E. (2022). "Persuading Republicans and Democrats to Comply with Mask Wearing: An Intervention Tournament". In: *Journal of Experimental Social Psychology* 101, p. 104299.

Goette, L., Huffman, D., and Meier, S. (2006). "The Impact of Group Membership on Cooperation and Norm Enforcement: Evidence using Random Assignment to Real Social Groups". In: *American Economic Review* 96.2, pp. 212–216.

Grimalda, G., Murtin, F., Pipke, D., Putterman, L., and Sutter, M. (2023). "The Politicized Pandemic: Ideological Polarization and the Behavioral Response to COVID-19". In: *European Economic Review* 156, p. 104472.

Güth, W., Huck, S., and Müller, W. (2001). "The Relevance of Equal Splits in Ultimatum Games". In: *Games and Economic Behavior* 37.1, pp. 161–169.

Hale, T., Angrist, N., Goldszmidt, R., Kira, B., Petherick, A., Phillips, T., Webster, S., Cameron-Blake, E., Hallas, L., Majumdar, S., et al. (2021). "A Global Panel Database of Pandemic Policies (Oxford COVID-19 Government Response Tracker)". In: *Nature Human Behaviour* 5.4, pp. 529–538.

Henkel, L., Sprengholz, P., Korn, L., Betsch, C., and Böhm, R. (2022). "The Association between Vaccination Status Identification and Societal Polarization". In: *Nature Human Behaviour*, pp. 1–9.

Herrmann, B., Thoni, C., and Gachter, S. (2008). "Antisocial Punishment across Societies". In: *Science* 319.5868, pp. 1362–1367.

Kimbrough, E. O. and Vostroknutov, A. (2016). "Norms Make Preferences Social". In: *Journal of the European Economic Association* 14.3, pp. 608–638.

Korn, L., Böhm, R., Meier, N. W., and Betsch, C. (2020). "Vaccination as a Social Contract". In: *Proceedings of the National Academy of Sciences* 117.26, pp. 14890–14899.

Kranton, R., Pease, M., Sanders, S., and Huettel, S. (2020). "Deconstructing Bias in Social Preferences Reveals Groupy and Not-groupy Behavior". In: *Proceedings of the National Academy of Sciences* 117.35, pp. 21185–21193.

Laebens, M. G. and Öztürk, A. (2021). "Partisanship and Autocratization: Polarization, Power Asymmetry, and Partisan Social Identities in Turkey". In: *Comparative Political Studies* 54.2, pp. 245–279.

— (2022). "The Erdoğan Government's Response to the COVID-19 Pandemic: Performance and Actuality in an Authoritarian Context". In: *Government and Opposition*, pp. 1–18.

Liu, Q., Qin, C., Liu, M., and Liu, J. (2021). "Effectiveness and Safety of SARS-CoV-2 Vaccine in Real-world Studies: a systematic review and meta-analysis". In: *Infectious Diseases of Poverty* 10.06, pp. 1–15.

Masclet, D., Noussair, C., Tucker, S., and Villeval, M.-C. (2003). "Monetary and Nonmonetary Punishment in the Voluntary Contributions Mechanism". In: *American Economic Review* 93.1, pp. 366–380.

Pemstein, D., Marquardt, K. L., Tzelgov, E., Wang, Y.-t., Medzihorsky, J., Krusell, J., Miri, F., and Römer, J. von (2023). "The V-Dem Measurement Model: Latent Variable Analysis for Cross-National and Cross-Temporal Expert-Coded Data". In: *Varieties of Democracy Institute Working Paper* 21.8th Ed.

Polack, F. P., Thomas, S. J., Kitchin, N., Absalon, J., Gurtman, A., Lockhart, S., Perez, J. L., Pérez Marc, G., Moreira, E. D., Zerbini, C., et al. (2020). "Safety and Efficacy of the BNT162b2 mRNA Covid-19 Vaccine". In: *New England Journal of Medicine* 383.27, pp. 2603–2615.

Somer, M. (2019). "Turkey: The Slippery Slope from Reformist to Revolutionary Polarization and Democratic Breakdown". In: *The Annals of the American Academy of Political and Social Science* 681, pp. 42–61.

Tank, P. (2020). *Turkey and COVID-19: Balancing Health and Economic Priorities*. Tech. rep. MidEast Policy Brief, 4. Oslo: PRIO.

Turkish Statistical Institute, T. (2023). *Employment, Unemployment and Wages*. Tech. rep. Data Portal for Statistics. URL: https://data.tuik.gov.tr/Kategori/GetKategori?p=Employment,-Unemployment-and-Wages-108.

Van Bavel, J. J. and Packer, D. J. (2021). *The Power of Us: Harnessing Our Shared Identities to Improve Performance, Increase Cooperation, and Promote Social Harmony*. Little, Brown Spark.

Watson, O. J., Barnsley, G., Toor, J., Hogan, A. B., Winskill, P., and Ghani, A. C. (2022). "Global Impact of the First Year of COVID-19 Vaccination: A Mathematical Modelling Study". In: *The Lancet Infectious Diseases* 22.9, pp. 1293–1302.

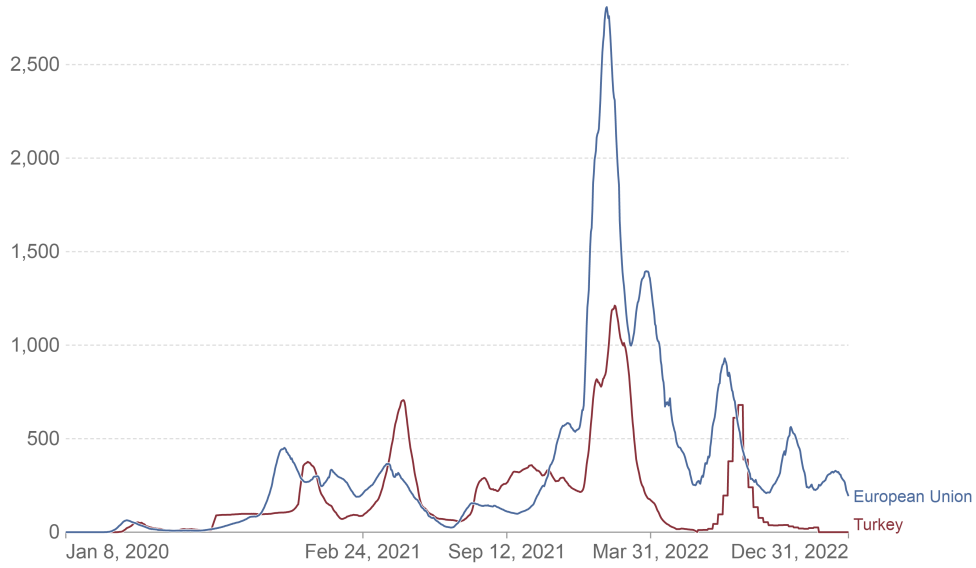
Weisel, O. (2021). "Vaccination as a Social Contract: The case of COVID-19 and US Political Partisanship". In: *Proceedings of the National Academy of Sciences* 118.13, e2026745118.

World Health Organization, W. (2023). *WHO Coronavirus (COVID-19) Dashboard*. Tech. rep. URL: https://covid19.who.int/.

A Online Appendix

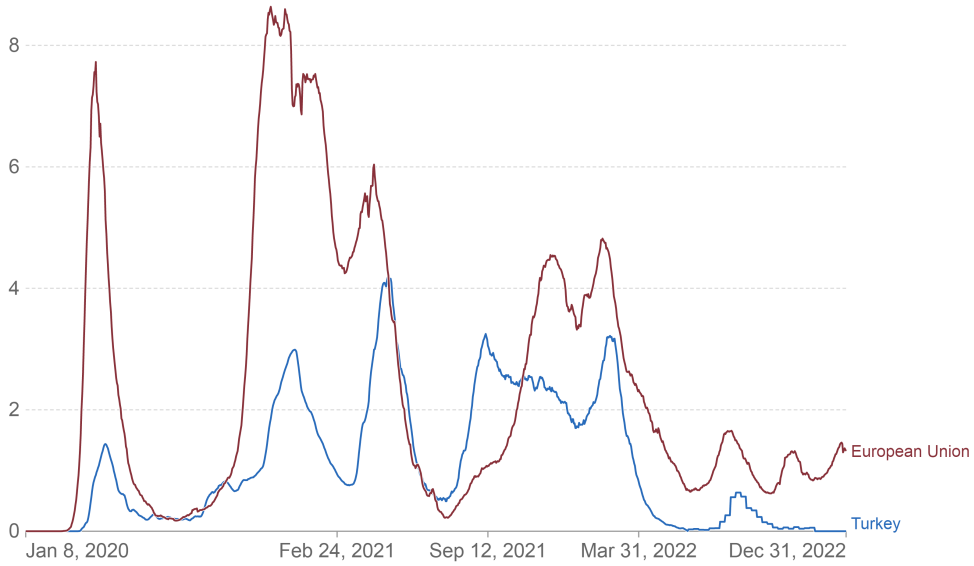
A.1 Figures

Figure A.1: Daily New Confirmed Covid-19 Cases (per million people, 7-day rolling average), Turkey and European Union, 2020-2022



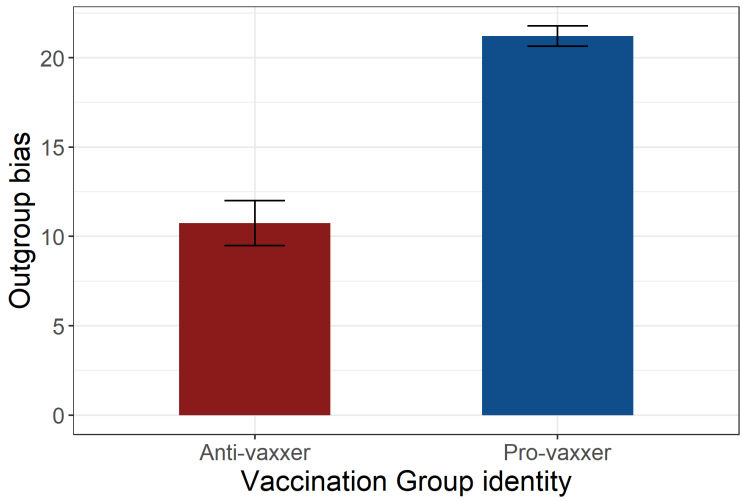
Source: World Health Organization, 2023.

Figure A.2: Daily New Confirmed Covid-19 Deaths (per million people, 7-day rolling average), Turkey and European Union, 2020-2022



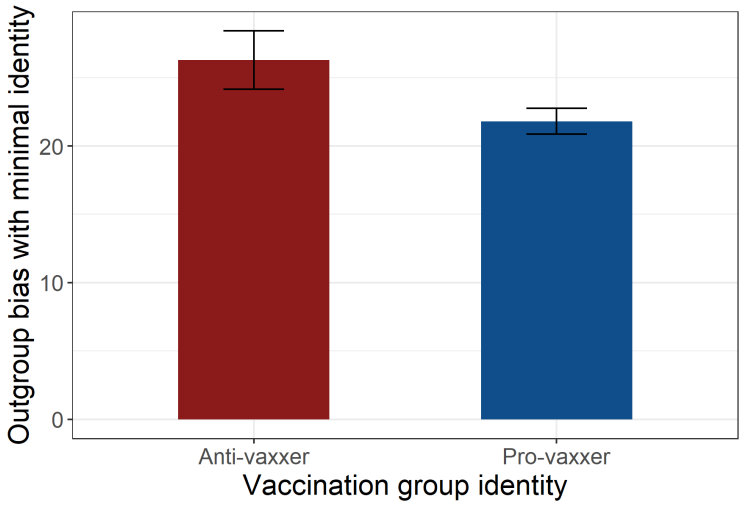
Source: World Health Organization, 2023.

Figure A.3: Outgroup bias based on vaccination attitudes: alternative measure



Notes: The figure depicts the outgroup bias shown by anti-vaxxers (pro-vaxxers) against pro-vaxxers (anti-vaxxers) measured using a two allocation tasks, in which the respondents allocate 100 TL between themselves and an anti- and a pro-vaxxer. The bars correspond to the standard errors.

Figure A.4: Outgroup bias based on minimal identity



Notes: The figure depicts the outgroup bias shown by anti- and pro-vaxxers in the minimal identity task. This is measure using two tasks, in which the respondents allocate 100 TL between themselves and an unknown participant who was born in the same month as themselves, and between themselves and an unknown participant who was born in a different month from theirs. The difference in the amounts allocated to the unknown persons gives the outgroup bias in the case of minimal identity. The bars correspond to the standard errors.

A.2 Tables

Table A.1: Predictors of anti-vaxxers: socio-demographic and socio-economic characteristics

	Anti-vaxxer
Ref. level: College educ.	
High school	0.026
	(0.015)
Primary school	0.050*
	(0.024)
Primary school drop	0.101
	(0.108)
Ref. level: 0-4000TL	
Income: 4000-8000TL	0.010
	(0.026)
Income: 8000-12000TL	−0.027
	(0.023)
Income: 12000-16000TL	0.037
	(0.072)
Income: 16000-20000TL	0.080
	(0.050)
Income: 20000TL+	0.010
	(0.033)
Male	0.023
	(0.016)
Age	−0.002***
	(0.001)
Num.Obs.	2483
R2	0.017

Notes: The table reports the results obtained from the OLS regression of identifying with anti-vaxxer group on education, income, gender, age, and NUTS-1 fixed effects. The baseline levels for education and income variables are, respectively *College education* and *Income: 0-4k*. The 95% confidence intervals are based on the standard errors clustered at the NUTS-1 level.

Table A.2: Relationship between outgroup bias based on minimal identity and vaccination attitudes

	Outgroup bias (vaccination attitudes)	
	Model 1	Model 2
Outgroup bias (minimal ID)	0.062**	0.068**
	(0.023)	(0.025)
Controls	No	Yes
Num.Obs.	2809	2478
R2	0.011	0.028

Notes: The table reports the results obtained from the OLS regression of outgroup bias in vaccination attitudes, measured by a third-party money allocation task in which anti- and pro-vaxxers allocate 100 TL between an anti- and a pro-vaxxer, on outgroup bias with minimal identity based on birth month.

A.3 Questionnaire

A.3.1 Pre-Treatment Questionnaire (Translated from Turkish)

- How safe do you think vaccines against Covid-19 are? [4 options from "absolutely not safe" to "absolutely safe"; no opinion]
- We define people in the community who distrust and oppose the vaccines developed against Covid-19 as **anti-vaxxer**, and those who trust and support the vaccines as **pro-vaxxer**.

  According to this definition, which of the following describes you best? [4 options from "I am strongly anti-vaccine" to "I am definitely in favor of vaccination"; no opinion]
- What is your Covid-19 vaccination status? ["I have not been vaccinated", "1 dose", ..., "5 doses", "I don't want to answer"]
- [If vaccinated] Which of the following was your first [second, third, ..., fifth] dose of vaccine? ["CoronaVac (Sinovac)", "Pfizer-BioNTech", "TURKOVAC"]
- [If vaccinated] When did you receive your first dose of vaccine? [January 2021, February 2021, ..., April 2022]
- How much do you think the Covid-19 pandemic will affect life in Turkey next fall and winter? [4 options from "will not affect life at all" to "very large degree"; no opinion]
- Please mark the month you were born [January, ..., December]

A.3.2 Post-Experimental Questionnaire (Translated from Turkish)

Please indicate how much you trust or do not trust the following organizations or persons.

- Modern medicine [4 options from "I absolutely do not trust" to "I completely trust"; no opinion]
- Pharmaceutical industry [4 options from "I absolutely do not trust" to "I completely trust"; no opinion]
- The state [4 options from "I absolutely do not trust" to "I completely trust"; no opinion]
- The government [4 options from "I absolutely do not trust" to "I completely trust"; no opinion]

- People I don't know [4 options from "I absolutely do not trust" to "I completely trust"; no opinion]

- [If (strongly) anti-vaccine] Which of the following best explains why you oppose vaccines against Covid-19? ["Distrust of modern medicine", "Not trusting the state", "Not trusting the government", "Concerns about long-term side effects of vaccines", "Religious reasons"," Ongoing health problems", No opinion]

- [If (strongly) anti-vaccine] Most pro-vaccine people ["Extremely conservative", "Conservative", "Secular", "Extremely secular", No opinion]

- [If (strongly) anti-vaccine] Most pro-vaccine people are [AKP voters, CHP voters, HDP voters, Good Party voters, MHP voters, Saadet Party voters, Other, No opinion]

- [If (strongly) anti-vaccine] Most pro-vaccine people are [Well educated, Educated, Uneducated, No opinion]

- [If (strongly) anti-vaccine] Most pro-vaccine people [Very trusting in the state, Trusting in the state, Do not trust the state, Anti-state, No opinion]

- [If (strongly) pro-vaccine] Which of the following best describes your views about people who oppose vaccines against Covid-19? ["I think these people are not educated enough", "I am afraid that these people will infect me or my loved ones", "I think that these people have prolonged the pandemic and delayed the return to normal life", "I think that these people's distrust of Covid-19 vaccines should be considered within the scope of personal freedoms", No opinion]

- [If (strongly) pro-vaccine] Most anti-vaccine people ["Extremely conservative", "Conservative", "Secular", "Extremely secular", No opinion]

- [If (strongly) pro-vaccine] Most anti-vaccine people [AKP voters, CHP voters, HDP voters, Good Party voters, MHP voters, Saadet Party voters, Other, No opinion]

- [If (strongly) pro-vaccine] Most anti-vaccine people [Well educated, Educated, Uneducated, No opinion]

- [If (strongly) pr-vaccine] Most anti-vaccine people [Very trusting in the state, Trusting in the state, Do not trust the state, Anti-state, No opinion]

In this part of the survey, we will ask for your opinions on daily events and the government's policies on these events.

- The Covid-19 pandemic has posed a very serious threat to human health. [5 options from "Strongly disagree" to "Strongly agree"]
- The Covid-19 pandemic has hit the country's economy very hard. [5 options from "Strongly disagree" to "Strongly agree"]
- The Russian-Ukrainian war has created a very serious danger for Turkey and other neighboring countries. [5 options from "Strongly disagree" to "Strongly agree"]
- What do you think about the government's health policies during the pandemic? [5 options from "Absolutely successful" to "Absolutely unsuccessful"]
- What do you think about the government's economic policies against the economic impact of the pandemic? [5 options from "Absolutely successful" to "Absolutely unsuccessful"]
- What do you think about the government's foreign policy regarding the Russia-Ukraine war? [5 options from "Absolutely successful" to "Absolutely unsuccessful"]

Public Policy Choices: In this section, we will ask you whether you would prefer to increase or decrease some public expenditures.
We would like to point out that an increase in public spending is covered by an increase in tax rates. On the other hand, a decrease in public expenditure means a decrease in the quantity or quality of public services provided to you.

(You can go to the next screen in 5 seconds).

- Amount of public spending on a **free health system** compared to what is currently being spent [5 options from "Should be much more" to "Should be much less"]
- Amount of public spending on **free education** compared to what is currently being spent [5 options from "Should be much more" to "Should be much less"]
- Amount of public spending on **unemployment benefit** compared to what is currently being spent [5 options from "Should be much more" to "Should be much less"]
- Amount of public spending on **pensions** compared to what is currently being spent [5 options from "Should be much more" to "Should be much less"]

- Amount of public spending on **social assistance for the elderly, disabled and poor citizens** compared to what is currently being spent [5 options from "Should be much more" to "Should be much less"]
- Please indicate which of the following different views you are closer to.
  - [5 options from "The welfare of the people is the responsibility of the state." to "People are responsible for their own well-being."]
  - [5 options from "Income inequality should be reduced." to "Income inequality can be justified."]
- Many people consider both **their personal freedoms** - the freedom to live, believe and speak as they wish - and their **personal security** to be very important.

  If you had to choose between freedoms and security, which would you consider more important? [Security, Freedoms]
- "Men make **better managers** than women." [5 options from "Strongly agree" to "Strongly disagree"]
- "It is a good thing for a country **if everyone** in it **shares the same traditions and customs**." [5 options from "Strongly agree" to "Strongly disagree"]
- How important do you think **obedience** is as a characteristic of a child? [5 options from "Very important" to "Not important at all"]
- Which of the following best describes your views on **homosexuality**? [5 options from "Absolutely unacceptable" to "Definitely within the scope of freedoms"]
- Which of the following best describes your views on **abortion**? [5 options from "Absolutely unacceptable" to "Definitely within the scope of freedoms"]
- Do you think the state should have the right to **monitor people in public spaces with surveillance cameras**? [4 options from "Absolutely must" to "Absolutely not"]

In this last part of our survey, we will ask you some questions about your demographic and socio-economic status.
As in the other sections, the information you provide in this section will always remain anonymous and will only be used in scientific studies. You can still leave the questions you are uncomfortable answering blank and move on to the next question.

- What is your birth year?
- What is your gender? [Male, woman, other]
- What is your marriage status? [Married, single]
- In which province do you reside? [81 provinces in Turkey]
- How many dependents do you have? [0, 1, 2, more than 2]
- How many elderly people do you care for? [0, 1, 2, more than 2]
- Which of the following is the last level of education you completed? [Primary school dropout, primary school, middle school, high school, university undergraduate, university master's degree, university doctorate]
- What is your current employment status? [Full-time employee, part-time employee, self-employed, unemployed and looking for work, student, unemployed but not looking for a job, retired]
- What is your mother tongue? [Turkish, Kurdish, Arabic, Laz, Zazaki, Greek, English, German]
- Which of the following is your monthly net income? [Less than 4000 TL, 4000 TL to 8000 TL, 8000 TL - 12000 TL, 12000 TL - 16000 TL, 16000 TL - 20000 TL, more than 20000]
- Which of the following reflects your religious view? [Muslim - Sunni, Muslim - Alevi, Muslim - Shia, Muslim - Alawite, Christian - Orthodox, Christian - Catholic, Christian - Protestant, Atheist, Deist, Agnostic]
- How religious do you consider yourself? ["Very religious", "Somewhat religious", "I am not religious at all"]
- Which of the following ethnic groups do you belong to? [Turk, Kurdish, Arab, Zaza, Laz, Circassian, Georgian, Bosniak]
- If there was an election next Sunday, which of the following political parties would you vote for? [Justice and Development Party (AKP), Republican People's Party (CHP), Peoples' Democratic Party (HDP), Nationalist Movement Party (MHP), Good Party (İYİP), Turkish Labor Party (TİP), Felicity Party (SP), Hometown Party (Muharrem

Ince), Democratic Party (DP), Zafer Party (Ümit Özdağ), Grand Union Party (BBP), Democracy and Progress Party (DEVA), Future Party, Motherland Party (ANAP), Democratic Left Party (DSP), Independent Turkey Party (BTP), Vatan Party (VP)]

- How interested are you in politics? ["I am very interested", "I'm a little interested", "Not interested", "Not interested at all"]

A.4 Instructions (Translated from Turkish) and Sequence of the Study

Consent Form

This survey is conducted jointly by researchers from Boğaziçi University and the Max Planck Institute (MPI) in Bonn as part of a scientific research project funded by the MPI.

In this study you will be asked some questions about your political views, preferences, religious beliefs, ethnicity and socio-economic status. The data collected will be anonymized and used only in this way in a scientific study of human behavior. The researchers conducting the study will not have access to any other information about you other than the information you provide in this questionnaire. The data collected in this study can only be published anonymously on a public platform. You can withdraw your consent to participate in this study at any time by contacting the Max Planck Institute. You may receive some monetary rewards in this study. The amount of your reward depends on the choices you and other participants make in this survey. Both this study and the resources that fund it are dedicated to basic science.

- I accept
- I do not accept

Basic Instructions

In this questionnaire, we will ask you about your preferences for different public policies, your opinion on vaccines against the Covid-19 (Corona) virus and some socio-demographic questions. In addition, we will provide you with brief information about the Covid-19 pandemic or some current events. You will also take part in some small games where you can earn money. When you reach the relevant part of the survey, you will be given detailed information about the rules for earning money.

The information you provide in this survey will always remain anonymous and will only be used for scientific studies. Nevertheless, you can leave the questions you are uncomfortable answering blank and move on to the next question.

Pre-Experimental Questionnaire

See the previous Section A.3.1 for the Pre-Experimental Questionnaire.

Information about the monetary rewards that can be won from the allocation questions

In this survey, there are **6 allocation questions for which you can win a cash prize in addition to your usual participation fee**. You will answer four of these questions after you have passed this screen. The other two allocation questions with monetary rewards will appear later in the survey.

Information about the reward you may win in addition to the survey participation fee for answering these cash prize questions is provided on the next page, please read it carefully.

(You can move to the next screen in 10 seconds).

At the end of the survey, a lottery will be held among the participants and **1 out of every 10 participants will be selected for the additional monetary reward**. In other words, there is a 10% chance that you will be selected.

In this survey you have two different ways to win this extra cash prize:

- If you are selected by lottery, one of the allocation questions you have answered will be randomly selected and **you will be paid the amount resulting from your decision on this question as an additional reward.**
- Some questions involve paying money to randomly selected participants other than yourself.

If one of your matched partners in these questions is selected by lottery and that person's randomly selected decision requires a payment to you, that payment will be made to you in the amount resulting from the decision made by your partner.

You have the same chance of being selected as a result of the lottery as the person you are matched with.

So when making decisions on allocation questions, please remember that these decisions are likely to be implemented and try to make decisions that you would be happy to see implemented.

(You can move to the next screen in 10 seconds).

Pre-treatment allocation tasks

The next 4 questions ask you to divide 100 TL between two people you do not know, or between yourself and one person you do not know. You will also indicate **whether** the people you do not know are **pro- or anti-vaccine**. These people will be randomly selected from other people participating in this study who are in the same income group as you.

As with the rest of the survey, we would like to remind you that there are no right or wrong answers in this section. What is important for us is that you answer the questions according to your personal views and preferences.

You can allocate the 100 TL that will be given to you for each question as you wish. Remember that this amount is allocated to you separately for each question.

- How would you divide 100 TL between **a person you do not know** who participated in this study and **was born in [participant's birth month]** and **a person you do not know** who participated in this study and was **born in another month**?

  Options: [100 TL - 0 TL], [80 TL - 20 TL], [60 TL - 40 TL], [40 TL - 60 TL], [20 TL - 80 TL], [0 TL - 100 TL]

- How would you divide 100 TL between an **anti-vaccine person** you do not know who participated in this study and a **pro-vaccine person** you do not know?

  Options: [100 TL - 0 TL], [80 TL - 20 TL], [60 TL - 40 TL], [40 TL - 60 TL], [20 TL - 80 TL], [0 TL - 100 TL]

- How would you split 100 TL between **yourself and a pro-vaccine person** who participated in this study but whom you do not know?

  Options: [100 TL - 0 TL], [80 TL - 20 TL], [60 TL - 40 TL], [40 TL - 60 TL], [20 TL - 80 TL], [0 TL - 100 TL]

- How would you divide 100 TL between **yourself and an anti-vaccine person** who participated in this study but whom you do not know?

  Options: [100 TL - 0 TL], [80 TL - 20 TL], [60 TL - 40 TL], [40 TL - 60 TL], [20 TL - 80 TL], [0 TL - 100 TL]

Treatments

- **Community Health Impacts of the Covid-19 Pandemic**

  According to official statistics, the Covid-19 pandemic has so far claimed the lives of nearly 100,000 Turkish citizens and sickened around 15 million people.

  (You can go to the next screen in 5 seconds).

- **Economic Impacts of the Covid-19 Pandemic**

  The Covid-19 pandemic is estimated to have reduced total production in Turkey by around 20 percent in the last two years and caused nearly 3 million people to lose their jobs.

  (You can move to the next screen in 5 seconds).

- **Russia-Ukraine War:**

  It is estimated that 15 thousand people lost their lives in the first three weeks of Russia's aggression against Ukraine and nearly 3 million people were forced to migrate to other countries. During this war, Turkey implemented the Montreux Straits Convention.

  (You can move to the next screen in 5 seconds).

Post-Treatment Allocation Tasks

For the 2 questions in this section, you will be divided into groups of 2 people. **In one question you will be paired with an anti-vaccine person and in the other with a pro-vaccine person**. These people will be randomly selected from other people participating in this study whom you do not know, but who are in the same income group as you. The other person in your group will only be told whether you are **anti-vaccine or pro-vaccine**.

For each question, both participants in the group will be given 100 TL each and **you can send** any amount of this money **to the other person in your group**.

The amount you send will be multiplied by 2 by us and paid to the other person you are grouped with. The part of 100 TL that you do not send will remain with you.

The person you are grouped with will also decide how much of their 100 TL to send to you. This can be any amount between 0 and 100 TL. The amount sent to you will be multiplied by 2 by us and paid to you.

Therefore, your total earnings will be the sum of these two amounts: The amount you didn't send to your groupmate + 2 times the amount your groupmate sent to you.

(You can move to the next screen in 10 seconds).

Information about the monetary rewards that can be earned in the allocation questions:

As we mentioned earlier, once the survey is over, a lottery will be played out among the participants and **1 out of every 10 people who took the survey will be selected for the additional cash prize.** In other words, you have a 10% chance of being selected.

In this survey you have two different ways to win this extra cash prize:

- If you are selected by lottery, one of the allocation questions you have answered will be randomly selected and **you will be paid the amount resulting from your decision on this question as an additional reward.**
- Some questions involve paying money to randomly selected participants other than yourself.

If one of your matched partners in these questions is selected by lottery and that person's randomly selected decision requires a payment to you, that payment will be made to you in the amount resulting from the decision made by your partner.

You have the same chance of being selected as a result of the lottery as the person you are matched with.

So when making decisions on allocation questions, please remember that these decisions are likely to be implemented and try to make decisions that you would be happy to see implemented.

(You can move to the next screen in 10 seconds).

- In this question, your group consists of **you and a pro-vaccine person**.

  How much of your 100 TL would you like to send to this person?

- In the previous question you were paired with a **pro-vaccine person**.

  How much of your 100 TL do you think this **pro-vaccine** person sent you?

- In this question, your group consists of **you and an anti-vaccine person**.

  How much of your 100 TL would you like to send to this person?

- In the previous question you were paired with an **anti-vaccine person**.

  How much of your 100 TL do you think this **anti-vaccine** person sent to you?

Post-Experimental Questionnaire

See the previous Section A.3.2 for the Post-Experimental Questionnaire.