

Putting Money Behind Words? Responding to Information During Tax Season

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Abstract

Designing effective tax policy requires an understanding of behavioral decision making and whether people are rational agents when it comes time to file taxes. In this paper, we first investigate whether people are local optimizers who choose to report earnings based on their most immediate feelings towards the government. We then test if transparency about government actions changes these decisions. We recruit close to 2,000 self-employed workers from Ecuador into a two-part experiment (artefactual and natural) designed to elicit preferences and beliefs for government spending, and randomly reveal the actual distribution intended to mimic a ‘tax-receipt’ used by many countries. When this information improves beliefs, participants report being more supportive of the government (0.30 s.d.), hold more favorable views towards taxes (0.24 s.d.), and reduce feelings of affective polarization (0.40 s.d.). These participants are less likely to file income tax returns and conditional on filing, declare less. When beliefs are worsened, we do not find any changes in stated outcomes, but do observe an increase in the likelihood of filing taxes and, conditional on filing, higher declarations. Both of these behavioral changes are consistent with free-riding.

JEL codes: D60, D83, D90, H26

Keywords: imperfect rationality, information intervention, artefactual experiment, natural experiment, taxes, free riding, affective polarization

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1 Introduction

A common challenge for growing, transitioning, and developed economies is understanding tax-paying behaviors and encouraging compliance. Classic economic theory models compliance as a function of marginal benefits and marginal costs, motivating policy measures that increase the cost of noncompliance (Allingham and Sandmo, 1972; Falkinger, 1988). However, applying extreme penalties via the increased frequency of auditing or by increasing associated fines may backfire and create an environment that incentivizes bribery and corruption and erodes trust in public institutions. Designing effective tax policies thus necessitates an understanding of the behavioral components inherent to each person.

Behavioral economic theory contributes by investigating two commonly-violated assumptions in the classical model highlighted above: non-standard preferences and imperfect rationality (Congdon et al., 2009). We focus on the latter. Imperfect rationality broadly suggests that when making decisions, people are unaware of their decision sets or are unable to choose between them optimally. In the context of reporting income and paying taxes, imperfect rationality might correspond to someone deciding how much to report based on their most recent feelings towards the government on *that* specific filing day or week, causing people to act more like local optimizers rather than global optimizers.

In this paper, we investigate the role of government transparency in the form of federal tax receipts designed to refocus a taxpayer's perspective from that of a local optimizer towards that of a global optimizer. Tax receipts are receipts for income taxes paid revealing where tax revenues are spent and for how much. These are used by many countries worldwide, including the United States at one point. With nearly 2,000 self-employed taxpayers in Ecuador, we design an experiment that collects current (local) beliefs about government expenditures and randomly delivers a tax receipt that reveals information about longer-run (global) averages. Conditional on preferences and beliefs, this information should either improve or worsen perceptions of the government. For those who should experience improved

beliefs, we document a 0.30 s.d. increase in government support, a 0.24 s.d. increase in perceptions towards taxes, and a 0.40 s.d. reduction in feelings of affective polarization. We do not find any changes when beliefs should be worsened. We strategically implement the experiment to allow us to investigate behavioral changes in filing taxes directly. Hence, the second part of this experiment corresponds to a natural field experiment. Participants who are likely to experience improved beliefs are less likely to file income tax returns and, conditional on filing, declare less. Participants who should experience worsened beliefs are more likely to file income tax returns and, conditional on filing, declare more. The contrast between both sets of stated and behavioral outcomes is consistent with free-riding. In both cases, when people have better perceptions of the government, they are more likely to feel better but are less likely to file taxes. These results offer several contributions.

Our study design contributes to the behavioral and experimental economics literature. Perhaps most similar to our paper, Cummings et al. (2009) use an artefactual experiment to identify tax morale as an important behavioral determinant in the tax-paying decision. Our experimental design allows us to contrast two sets of results: 1) stated behaviors from an artefactual experiment and 2) behavioral responses from a natural field experiment. Artefactual results indicate that improving beliefs generates an improvement in stated behaviors towards paying taxes; a result also supported in Cummings et al. (2009). Our natural experimental results imply a conflict with these artefactual counterparts, a concern highlighted by the previous work. Individuals who report having increased support are less likely to file their taxes, suggesting free-riding. Hence, our results highlight the importance of experimental contexts and the need for all types of designs - lab, artefactual, framed, natural - to understand the scope of a treatment's impact thoroughly (List, 2020; Harrison and List, 2004; Levitt and List, 2009).

Several governments worldwide communicate with their citizens via tax receipts during the country's tax filing season. These policies' objective is to increase transparency and improve tax payments. In 2011 in the United States, the White House created a now-defunct

tool called the “Federal Taxpayer Receipt” that generated individualized tax receipts for US taxpayers. This tool has been replaced with a more general website ([USASpending.gov](https://www.usaspending.gov)) that reports aggregate revenues and average allocations. The Australian Taxation Office (ATO) sends physical copies of individualized tax receipts - usually along with the original notice of assessment - that show how taxes to be paid are allocated across key categories of government expenditure.¹ As stated by the ATO, tax receipts “increase transparency on how the government spends taxpayers’ money.” However, increased transparency may not always result in pro-social outcomes. Since new information is endogenous to prior beliefs and perceptions, it may either improve or worsen perceptions (Alesina et al., 2020; Thaler, 2019; McNamara and Mosquera, 2022). Our findings corroborate the ambiguity of this effect and suggest that the timing of communication and its content are important. Receiving local positive information about government expenditures before paying taxes potentially induces free-riding behaviors, while receiving local information that worsens perceptions of expenditure distribution might increase reporting taxes and payments.

Finally, our study contributes to a better understanding of policies and reforms needed to support changing labor forces (Thomas, 2018). In 2020, approximately 60 million US workers participated in gig work, contributing 1.21 trillion to the economy, which is close to 5.7 percent of total GDP (Appendix Figure A.1).² There has been steady growth in the number of people working multiple jobs, and these secondary jobs make up close to 28 percent of total earnings (Bailey and Spletzer, 2020). Governments have historically relied on self-reporting to collect taxes for gig work and self-employed labor. Our results show that self-reporting is related to behavioral influences, suggesting there is possibly too much of a compliance burden. Communicating uniform and centralized reporting requirements could result in net-positive outcomes. For example, our results support recent policy changes in the United States that require third-party payment systems (e.g., Venmo, PayPal, or Cash

¹See <https://www.ato.gov.au/Individuals/Your-tax-return/Check-the-progress-of-your-tax-return/Tax-receipt/>

²See Chris Kolmar, “23 Essential Gig Economy Statistics [2022]: Definitions, Facts, And Trends On Gig Work,” Zippia, Feb. 6, 2022, <https://www.zippia.com/advice/gig-economy-statistics/>.

App) to provide Form 1099-K's to businesses with annual transactions exceeding \$600.

To discuss the external validity of our empirical results, we follow the List (2020) Selection, Attrition, Naturalness, and Scaling (SANS) conditions in our reporting. First, in terms of selection, our sample is a subset of self-employed individuals from Ecuador. These individuals work in various occupations that cover the scope of potential self-employment options. This includes individuals driving for Uber to self-employed professionals like medical doctors and lawyers. These occupations are representative of self-employment around the world. Participation in the survey is minorly related to age, gender, and the likelihood of paying taxes, suggesting our results speak for a population more engaged with politics. In our experimental evaluation, we observe non-random attrition but bound its impact following the procedure in Lee (2009). For the tax filing analysis, we observe random attrition and restrict the sample to individuals who completed the survey before their tax date. Considering the naturalness of the choice task, setting, and time frame, we use a survey experiment to elicit beliefs and then check tax payments using public data without participants being able to observe this. Thus, our setting is one in which our subject pool is engaged in a natural and familiar task and is not placed on artificial margins. Finally, in terms of scaling our results to other populations, our design approximates the information governments communicate through “tax receipt” policies. However, it is important to note that individuals may react differently to information from an authority.

The rest of the paper is organized as follows. Section 2 provides background on the tax filing process in Ecuador and describes how our experimental design integrates with this process to allow us to identify behavioral effects on tax filing. Section 3 discusses the estimation strategy used to identify treatment-on-the-treated effects. Section 4 evaluates treatment effects for both stated responses and behavioral outcomes. Section 5 discusses policy implications and concludes.

2 Experimental Design

This section describes the primary steps that comprise our experimental design. In summary, our experiment is designed to test how new information related to government spending that potentially either improves or worsens beliefs impacts an individual's stated behaviors and identify revealed behavioral patterns in the form of filing taxes. To look at these, we recruit participants from across Ecuador using email invitations that direct them to an online survey experiment. In this experiment, we identify an individual's current preferences and beliefs about government spending allocations and randomize an information treatment that reveals the actual distribution from an entire year of spending decisions. In effect, some participants' beliefs are likely to be improved while for others may be worsened. We use this exogenous variation to test for effects on individual stated behaviors by including an outcome questionnaire that collects information on three primary outcomes of interest: 1) support towards the government, 2) perceptions about taxes, and 3) affective political polarization. Hence, the first part of our experiment corresponds to an artefactual survey experiment.

Finally, we strategically time the experiment in a way that allows us to test how being misinformed impacts behaviors related to filing their actual self-employed taxes with the Ecuadorian IRS. The second part of our experimental design is thus a natural field experiment (Harrison and List, 2004). Participants make real decisions in the form of filing taxes. This is also done in their own environment without any direct or indirect involvement by the research team. An overview of Ecuador's tax filing process is briefly discussed, and a more detailed discussion of the major experimental steps follows.

2.1 Background of the Tax Filing Process in Ecuador

In aggregate, Ecuador has seen significant economic growth over the last decade, recording nearly \$110 billion in the nominal gross domestic product (GDP) in 2019.³ This statistic makes the country the seventh largest in Latin America and the eleventh largest across the entire Americas. Using World Bank classifications, its gross national income (GNI) of about \$6,000 places the country as an upper-middle-income country.

According to 2021 data from The World Bank, Ecuador's reported labor force consists of almost 8.5 million people. For comparison, Canada had a labor force of 21 million, Australia close to 13.6 million, and Sweden about 5.6 million.⁴ Nearly 50 percent of Ecuador's labor force is estimated to be comprise of self-employed individuals.⁵ While relatively higher than some of its peers (Canada, 15.2 percent; Australia, 16.6 percent; Sweden, 9.8 percent), there is a growing trend of self-employment coming from the 'gig' economy (Abraham et al., 2019). Hence, Ecuador is a relevant setting to understand potential factors that impact behaviors related to reporting self-employed income and paying their associated tax. These issues are of global importance and relevance.

To understand the political context in Ecuador, it is important to note that in the last 50 years, a conflict between two political ideologies has characterized the political context in Ecuador and Latin America (Sierra Freire and Delgado Chavez, 2021). On the one hand, there is a series of political movements with ideological positions similar to the spectrum of ideologies of the mainstream political parties in the United States and Western Europe. These political parties and movements are typically labeled as neoliberal. However, as illustrated by Venugopal (2015), neoliberalism is "a controversial, incoherent, and crisis-ridden term." This is a consequence of the diversity of positions relative to the roles of markets and government of the political movements labeled under the neoliberalism umbrella. On the other hand, there is a series of political movements aligned with socialism. These movements

³Data from the International Monetary Fund's (IMF) estimates in their World Economic Outlook.

⁴See <https://data.worldbank.org/indicator/SL.TLF.TOTL.IN?locations=EC>

⁵See <https://data.worldbank.org/indicator/SL.EMP.SELF.ZS?locations=EC>

are currently grouped as the XXI century socialism. They favor nationalizing sectors of the economy and see the State as the main political and economic actor (Ramírez Montañez, 2017). It is typical for this type of government to default on its debt payments. For instance, Argentina defaulted in 2001 under Nestor Kirchner, and Ecuador defaulted in 2009 under Rafael Correa. Both governments were advocates of XXI-century socialism. Again, there is a diversity of positions relative to the roles of markets and government of these political movements. Both neoliberal and socialist movements rely on a strong individual figure - *caudillo* - (Sierra Freire and Delgado Chavez, 2021) and engage in populist practices where policies are oriented to gain votes.

Within this general context, Ecuador had presidential elections in 2021. Ecuadorian elections have two rounds. In the first round, there were 16 candidates. The two most voted moved to the second round. They were Andres Arauz, a candidate whose party is aligned with the XXI century socialism ideology, and Guillermo Lasso, who is aligned with centrist, market-oriented, political and economic beliefs. This composition mirrored the mix of candidates in the previous two presidential elections. In fact, Lasso was a finalist in 2014 and 2017 but lost to Rafael Correa and Lenin Moreno, whose party was the same as Arauz's. In 2021, Lasso won in a relatively close election, with 52.4 percent of the votes. This was somewhat unexpected as Arauz won the first round with 32.7 percent of the vote, while Lasso was second with 19.7 percent. This switch in the results suggests that the Ecuadorian electorate has some individuals with polar positions and a majority that switches depending on the country's current situation. In July 2021, when we ran the intervention, Lasso enjoyed a popularity of over 70 percent due to a successful vaccination campaign against COVID-19.

In Ecuador, personal income taxes are required to be paid by all salaried employees and self-employed individuals. Income is taxed progressively in brackets, starting at 0 percent for low-income earners and up to 35 percent for higher-income earners. All working residents must file taxes for income generated the previous year in March. For salaried employees, employers pay monthly taxes on their behalf, removing any additional reporting requirements

beyond simply filing in March.

When it comes to self-employed earnings, taxpayers self-report to Ecuador’s Internal Revenue Service (IRS) in three moments. In July, self-employed individuals report their earnings from the first semester of the year. In January, these individuals report their earnings from the second semester of the previous year.⁶ Finally, in March, they file their final tax report and pay taxes. Earnings reported in July and January must add to the total reported in March.⁷

Taxpayers face specific filing deadlines during the months they have to file taxes. These deadlines depend on the ninth digit of their taxpayer identification number (Registro Unico de Contribuyentes - RUC). Obtaining this identification is required for anyone performing an income-generating activity.⁸ RUCs consist of thirteen digits without letters or special characters. The first two digits correspond to the province of residence. The third through ninth digits are random numbers unique to every individual. The deadline for individuals whose RUC has a ninth digit ending in a “1” is the 10th of the month. RUCs with a ninth digit ending in a “2” must file their taxes by the 12th of the month, and so on. If the deadline falls on a weekend or holiday, it moves to the next business day.

2.2 Recruitment

The IRS publicly reports information on individuals with RUCs at <https://www.sri.gob.ec/catastros>. These data include the RUC, name, economic activity, the date the RUC was obtained, and if it is active. We kept all active RUCs. We merged this information

⁶Formally, these reports are part of filing for a value added tax. Generally, self-employed individuals are only required to report their earnings as they do not retain value added tax from other parties.

⁷Some individuals can choose to make an advance payment on their income tax. This advance payment is calculated as a percentage of the reported tax of the previous year. Individuals choose in March, when they file their taxes for the previous year, if they want to make the advance payment. The advance payment is typically paid in July and September. In 2021, during our experimental period, the Ecuadorian IRS moved the September deadlines to January of the following year (2022) to alleviate financial pressures resulting from the Covid-19 pandemic.

⁸As indicated by the IRS, “(a)ny individual, juridical person and entity without juridical personality, national or foreign, who initiates or carries out economic activities in Ecuador on a permanent or occasional basis or that is a holder of goods or rights that generate or obtain profits, benefits, remunerations, fees and other income, subject to taxation in Ecuador.”

with contact data using the RUCs and returned emails for close to 350,000 individuals from across the country.⁹ Furthermore, with the RUC, we can access the amount of taxes paid totaled across the two filing periods. The IRS makes these data publicly available at <https://srienlinea.sri.gob.ec/sri-en-linea/SriDeclaracionesWeb/ConsultaImpuestoRenta/Consultas/consultaImpuestoRenta>.

With this framework, we strategically recruit self-employed taxpayers to participate on dates that are close to the individual’s tax filing deadline. We can identify specific tax filing deadlines because we observe the unique RUCs. Figure 1 presents a summary of recruitment and the experimental timeline. Throughout July 2021, we sent out 349,880 emails with links to an online survey experiment.¹⁰ The email says (in Spanish) “Are you interested in participating in a research project and the opportunity to win gift cards up to \$500? Our team of researchers from UDLA and ACU need your help by completing a short survey on political preferences. If you are interested, please click on the link to begin.” Our email is strategically worded to limit sample selection and not reveal any of the research’s objectives or outcomes. These emails are scheduled to be sent out 1-day before an individual’s specific tax filing deadline.¹¹ From this sample, a total of 4,358 people click the link to participate generating a click-through rate (CTR) of about 1.2 percent. This CTR is comparable to its industry counterpart which ranges from 0.26 percent to 1.2 percent.^{12,13}

Following this step, we target the January 2022 tax filing deadline similarly. For those who complete the initial survey, we send out another round of email invitations two days before their scheduled tax filing deadline. In the second round, we remind individuals of

⁹We cannot disclose the contact information source due to the sensitivity of the data. Ecuadorian regulations in 2021 allowed sending emails to individuals as long as they were given the option to unsubscribe. Before starting the survey, we obtained consent from participants.

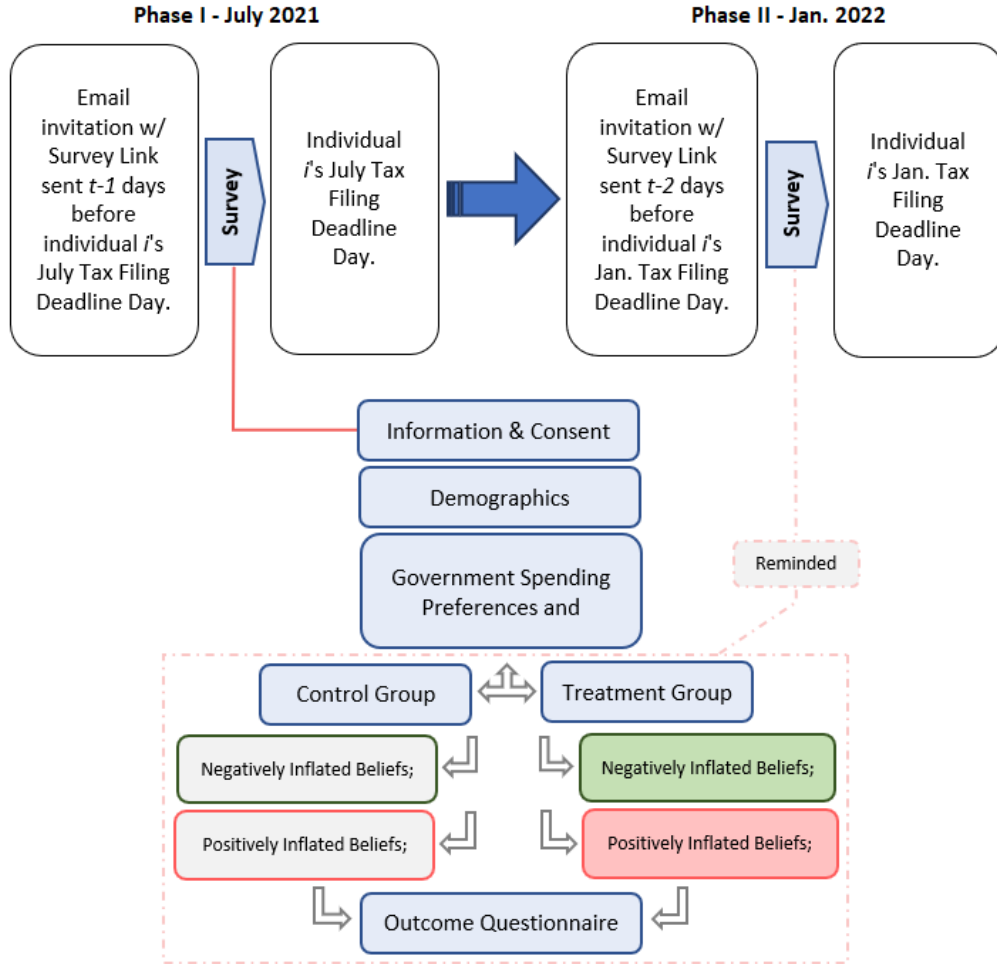
¹⁰Appendix Figure D.1 displays a copy of the recruitment email.

¹¹Since our experimental design exhausted all available recruitable participants, the choice to recruit - and thus by extension, treat individuals - close to the tax filing deadline was made to maximize the intensity of treatment on tax reporting.

¹²See Iggy Durant, “What Average Open Rate For Email Can Tell You About Your Campaigns?,” Peep Strategy, September 12, 2022, <https://peepstrategy.com/average-open-rate-for-email/>.

¹³Furthermore, this comparison suggestively attenuates concerns regarding selection as our recruitment does not over- or under-sample relative to what would be expected in email-based recruitment.

Figure 1: Experimental Timeline & Survey Design



Notes: This figure presents an overview of the two primary experimental stages at the top and a summarization of each step. The bottom panel highlights the artefactual survey and its design. In the first phase (July tax filing deadline) of the experiment, participants complete the survey in its entirety. In the second phase (January tax filing deadline) we simply remind participants of their original responses.

their responses from the first survey and have them complete an outcome questionnaire. In all estimates, we report results from the first survey. In total, we sent out 983 emails in the second phase.

In each survey, participants are incentivized with entrance to a lottery drawing for multiple gift cards of up to \$500. For both phases, we offer one gift card equal to \$500, five gift cards of \$100, and ten gift cards of \$50. To be entered into the drawing, participants must complete the survey.

2.3 Survey Experiment

After the link to participate on the email invitation is clicked, potential participants are provided basic information about the survey and provide consent to participate in the experiment.¹⁴ Upon consenting, all participants are asked basic demographic questions, including race, education, and political views.

Following this step, we use a modified version of McNamara and Mosquera (2022) to elicit individual preferences and expectations towards government spending allocations.¹⁵ Given two different spending categories that a government can allocate its budget towards, we ask participants how much of a given \$100 they would prefer to have allocated between the two giving a measure of individual spending preferences, P_i .¹⁶ Participants are then asked how they believe the current government allocates across the two categories giving a measure of individual spending beliefs, E_i .¹⁷ Hence, with data on the actual spending allocation R , we can back out and differentiate between individuals who have negatively inflated beliefs versus those who have positively inflated beliefs. Consider the following hypothetical.

Suppose the government allocates funds equally between two spending categories A and B , that individual i prefers to allocate \$90 to A and \$10 to B , but believes the government only allocates \$20 to A and \$80 to B . For category A , without knowing the real allocation, the individual reveals that they believe the government underfunds A by \$70 relative to their preferences. However, assuming rationality and Bayesian learning, revealing the real allocation of an equal split should treat the individual to an improved belief that the government only under-funds A by \$50. This works analogously for B . We refer to the case described as

¹⁴A copy of the information and consent screen is provided in Appendix Figure D.2. More generally, a full copy of the entire experiment is in Appendix Section D.

¹⁵A copy of the experimental screens for both can be seen in Appendix Figures D.9 and D.10. We randomize the ordering of elicitation and do not find any significant differences in tests for ordering effects.

¹⁶Specifically, participants are asked “(s)uppose you are responsible for planning the government budget. The government receives \$100 and asks you to distribute it between two categories. How would you like to distribute \$100?” McNamara and Mosquera (2022) provide evidence that this question wording elicits average spending preferences over marginal.

¹⁷Specifically, participants are asked “(t)hink about individuals in the executive and legislative branches responsible for planning the current government budget. The government receives \$100 and asks them to distribute it between two categories. How do you think they would distribute \$100?”

somebody holding *Negatively Inflated Beliefs*. If treated with information about R , beliefs should *Improve*. Conversely, depending on an individual’s initial set of preferences and beliefs relative to the real allocation, an individual could hold *Positively Inflated Beliefs* whereby revealing R should cause beliefs to *Worsen*. We consider all potential cases including those that do not change beliefs.

In this survey, participants are asked to allocate funds between A) education programs and B) payments on government debt. These were selected because they are funded similarly yet draw partisan criticisms. Once preferences and beliefs are elicited, participants are randomized into a control or treatment group. In the control group, a simple summary of their response is provided. In the treatment group, individuals are provided a summary of their responses and then revealed the actual spending distribution of R . As highlighted in the example above, this can either treat an individual to improved beliefs or to worsened beliefs. In light of this, we are able to estimate effects separately for these two groups by using their respective counterparts in the control group.¹⁸ That is, we can compare treated participants who have *Negatively Inflated Beliefs* with untreated participants holding *Negatively Inflated Beliefs* to estimate the likely impacts of *improving* beliefs, and we can compare treated participants who have *Positively Inflated Beliefs* with untreated participants holding *Positively Inflated Beliefs* to estimate the likely impacts of *worsening* beliefs. A complete description of this will be discussed in Section 3. Following treatment assignment, all participants are directed to complete an outcome questionnaire.

2.4 Outcome Questionnaire

All participants are prompted with a questionnaire that contains outcome questions related to three primary outcome categories of interest.¹⁹ For each of these categories, we

¹⁸The decision to estimate effects separately for the two groups was made before any data analysis. Our experimental design follows the procedures in McNamara and Mosquera (2022), which intentionally relies on identifying effects separately. This is further verified by copies of grant applications submitted before implementing the experiment. These are made publicly available on the researcher’s websites.

¹⁹See Appendix Figures D.13 and after for a full copy of the experimental questions.

construct indices following the procedure outlined in Anderson (2008) by weighting by the inverse of the covariance between each variable within the category. To ensure each outcome has the same directional meaning in the context of other variables contained in an index, we reorient some outcomes by multiplying by -1. A full description of each variable comprising each index and its associated question text is displayed in Appendix Section C.

The first index measures support towards the federal government and the country on the whole (hereafter referred to as the “Support Index”). This index contains questions such as “(i)n general, do you approve or disapprove of the job Guillermo Lasso is doing as president?”, and “(a)ll in all, do you think things in Ecuador are generally headed in the right direction, or do you feel things are off on the wrong track?” Positive movements in this index indicate increases in support.

The second index captures views and perceptions of paying taxes (hereafter referred to as the “Tax Index”). Examples of questions in this index are “(h)ow fair do you think our present federal tax system is?” and “(d)o you think that people in the government waste a lot of the money we pay in taxes, waste some of it, or do not waste very much of it?” Positive movements in this index are associated with increased sentiment towards the tax system.

The third index is designed to gauge feelings of affective political polarization (hereafter referred to as the “Polarization Index”). Generally speaking, polarization is a broad term that often encompasses many different feelings. For example, whether someone conforms to a group or the degree of social homophily in a group. In this paper, we focus on affective polarization intended to capture differences between feelings towards an individual’s in-group and their out-group (Iyengar et al., 2019). Some questions used to measure affective polarization are “(t)hink of those who voted for the opposite political candidate as you. Would you say your overall opinion of these people is unfavorable or favorable?”, which can be compared to another question that asks about feelings towards those who voted for the same candidate. Another example question in this index is “(g)enerally speaking, would you say that most people can be trusted or that you need to be very careful in dealing

with people?” In aggregate, positive movements in the polarization index correspond to increases in affective polarization, or a *worsening* difference between in-group and out-group sentiment.

After completing the outcome questionnaire, the initial survey is complete. We do not interact with participants after this point other than to facilitate payments until their next filing period in January. At this later date, participants are emailed again, reminded of their earlier participation, and asked to complete another outcome questionnaire. Upon completing the questionnaire, we again only interact with participants after this point to facilitate payments. Since tax data in Ecuador is publicly available, we can further track how the treatments impact real behaviors in a natural field experiment setting without any mention or interaction with participants.

2.5 Tax Data

As mentioned in Section 2.2, we can use an individual’s RUC to access the total amount of income tax reported to Ecuador’s IRS. This information is publicly available and covers the fiscal years 2000–2021. The IRS reports whether an individual submitted a tax report and the amount reported. We focus on the period between 2015 and 2021, as not all individuals were old enough to be obligated to report taxes before 2015. This way, we have six years of pre-intervention data that allow us to use a difference-in-difference method.

3 Estimation Strategy

Throughout this paper, we interchangeably refer to people with *Negatively Inflated Beliefs* (*Positively Inflated Beliefs*) as the “Improved Belief” (“Worsened Belief”) group since they are likely to update beliefs in a positive (negative) direction relative to the two spending categories. For completeness, this does not necessarily mean that beliefs are changed for all participants and can depend on many other factors. Consider the following examples.

By randomly revealing the real spending allocation R , we can compare treated parti-

participants with *Negatively Inflated Beliefs* to their untreated counterparts. In the context of *Negatively Inflated Beliefs*, these participants initially believe the government is allocating funds between the two spending categories (education vs. debt) worse than what is individually preferred and expected. For example, this could correspond to someone who prefers more education spending relative to debt spending but initially believes the government spends everything on debt. In reality, the government spends on both. In this case, treatment can *improve* beliefs by showing that the real allocation is closer to their preferences and expectation. By comparing outcomes between treated and untreated individuals, we estimate the treatment on the treated (ToT) effects of someone likely to *improve* beliefs.

Similarly, we can compare treated participants with *Positively Inflated Beliefs* to their untreated counterparts. In this context, these participants initially believe the government is allocating funds between the two spending categories better than what is individually preferred and expected. For example, this could be someone who initially believes the government allocates identically to their preferences when there may be some differences in reality. Treatment, in this case, *worsens* beliefs by showing the real allocation is further away from their preferences and expectations. By comparing outcomes between treated and untreated individuals, we estimate the treatment on the treated (ToT) effects of someone likely to have *worsened* beliefs.

Let Y_i be defined as an outcome of interest for participant i , and define i 's treatment to either an *improved* or *worsened* belief as T_i^j for $j = 1, 2$ where T^1 corresponds to *improved* beliefs and T^2 corresponds to *worsened* beliefs, then we can estimate the ToT effects of belief changes using the following regression:

$$Y_i = \beta_0 + \sum_{j=1}^2 \beta_j \cdot I(T_i^j == 1) + \epsilon_i \quad (1)$$

where β_1 and β_2 correspond to the ToT effects of improving and worsening beliefs respectively. Since treatment is randomly assigned at the individual level without any clustering in sampling, we use heteroskedastic robust standard errors in all outcome specifications (Abadie

et al., 2017).

We are also able to incorporate an additional vector of individual-level covariates, X_{ik} for $k = 1, \dots, K$ variables controlling for dimensions such as race, education, etc., by including $\sum_{k=1}^K \delta_k \cdot X_{ik}$ into the primary regression above. These results will be reported separately and referenced when necessary. Similarly, heterogenous effects and robustness checks investigating various subgroups will be reported separately as well. Our experimental survey investigates six outcomes of interest (three primary indices across two groups of participants). To address possible concerns regarding multiple hypotheses, we include and reference when necessary adjustments by constructing Sharpened False Discovery Rate (FDR)-adjusted *p-values* (Benjamini et al., 2006; Anderson, 2008).

To estimate the behavioral effect of a change in beliefs on tax reporting, we exploit the fact that we observe a pre-intervention period in the data and use difference-in-differences methods to increase precision. The sample decreases when we match the tax data with the survey data. We use the following specification:

$$y_{it} = \beta_0^j + \beta_1^j Post_t + \beta_2^j T_i^j + \beta_3^j Post_t \cdot T_i^j + \varepsilon_{it}^j \forall j = 1, 2 \quad (2)$$

where β_3^1 and β_3^2 correspond to the ToT effects of improving and worsening beliefs. There are two primary behavioral outcomes of interest. First, an indicator for whether the individual submitted a tax report to the IRS. Second, the amount of tax reported. We check if the results are robust to the framing of the treatment and to individual fixed effects that control for any time-invariant characteristic. We cluster standard errors at the individual level.

Beyond these steps, we also test for effects on the full distribution of outcomes. This is implemented by using Kolmogorov-Smirnov based statistics to non-parametrically test for equality of the distributions, as well as first and second-order stochastic dominance of treatment over control (Abadie, 2002).

4 Treatment Evaluation

4.1 Descriptive Results

In total, we send out 349,880 recruitment emails. From this set, 2,495 people consent to participate, of whom 1,902 completed the survey. Regarding selection into the experiment, Appendix Table A.1 summarizes differences between participants and those who opted out. Participants are more likely to be male, younger, more educated, and more likely to have filed taxes in a prior period (2018). This may suggest that our results speak for a more engaged group with politics. However, it is worth noting that these differences are small.

Appendix Table A.2 summarizes attrition during the experiment. Of the initial 2,495 participants, 289 dropped out before being assigned to either the control or treatment group. These participants vary in characteristics such as education and political preference. After being assigned to control vs. treatment, 304 participants did not complete the experiment. This attrition is generally random based on individual characteristics but does depend on treatment. One possible reason might be minor differences in the experiment length between the two groups. For example, the treatment group is exposed to a few additional screens presenting treatment information. In this step, we observe 72 treated individuals drop out. Beyond this point, however, the remaining 232 who dropped out during the outcome questionnaire do not vary by characteristics or treatment status. In order to address any possible concerns regarding non-random attrition, we begin our primary evaluation by reporting effects for the full sample that completes the survey along with bounded estimates following the procedure in Lee (2009).²⁰ Table 1 presents summary statistics for this sample and additional subgroups.

In Table 1, column (1) presents descriptives for our primary sample. Since we are interested in identifying the differential effects between improving and worsening beliefs, we also

²⁰In practice, this is implemented using the *leebounds* Stata function built and described within Tauchmann (2014).

Table 1: Sample Summary Statistics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Full Sample	Improved Beliefs			Worsened Beliefs		
		Control	Treated	p-value	Control	Treated	p-value
% Women*	0.40 (0.49)	0.36 (0.48)	0.39 (0.49)	0.57	0.40 (0.49)	0.41 (0.49)	0.77
Age in years*	42.79 (12.33)	42.85 (11.78)	42.93 (12.61)	0.94	42.84 (12.60)	42.62 (12.23)	0.77
% non-Ecuadorian	0.15 (0.35)	0.15 (0.36)	0.17 (0.38)	0.43	0.12 (0.33)	0.15 (0.35)	0.26
% Married*	0.77 (0.42)	0.74 (0.44)	0.75 (0.43)	0.72	0.79 (0.41)	0.77 (0.42)	0.63
Number of children	1.48 (1.42)	1.47 (1.33)	1.45 (1.38)	0.88	1.56 (1.43)	1.40 (1.50)	0.06
% College or more	0.71 (0.45)	0.68 (0.47)	0.75 (0.44)	0.06	0.69 (0.46)	0.73 (0.45)	0.20
Hispanic	0.92 (0.28)	0.92 (0.28)	0.94 (0.24)	0.25	0.90 (0.30)	0.92 (0.27)	0.22
%Urban	0.84 (0.36)	0.85 (0.36)	0.82 (0.38)	0.38	0.85 (0.35)	0.84 (0.36)	0.64
%SubUrban	0.09 (0.29)	0.08 (0.28)	0.10 (0.29)	0.52	0.10 (0.30)	0.09 (0.29)	0.68
%Rural	0.06 (0.25)	0.07 (0.25)	0.08 (0.27)	0.58	0.05 (0.22)	0.07 (0.25)	0.22
Vote Lasso	0.68 (0.47)	0.59 (0.49)	0.67 (0.47)	0.03	0.70 (0.46)	0.71 (0.45)	0.80
News Bias	57.21 (18.29)	55.65 (19.28)	58.07 (18.05)	0.08	58.19 (17.89)	56.63 (18.17)	0.14
Social Views	53.18 (22.60)	48.44 (22.22)	52.19 (23.77)	0.03	55.19 (22.08)	54.72 (22.19)	0.72
Econ Views	60.11 (23.14)	56.10 (23.09)	58.39 (23.98)	0.19	62.51 (22.75)	61.22 (22.69)	0.33
% Filed taxes in 2018*	0.51 (0.50)	0.51 (0.50)	0.52 (0.50)	0.84	0.49 (0.50)	0.52 (0.50)	0.29
N	1,902	364	365		602	571	

*Notes: This table presents summary statistics for the full sample who finishes the survey (1), the Improved Belief group in columns (2)-(4), and the Worsened Belief group in columns (5)-(7). For each respective group, statistics are provided for the control and treatment groups, as well as a test for differences in means between the two presented in the p-value column. Standard deviations in parenthesis. * indicates variable only available if a participant provides their RUC.*

report summary statistics for both control and treatment groups. The groups qualitatively compare to each other on variables such as education, the average number of children, and racial demography but tend to differ on variables related to political affiliation. People who hold negatively inflated beliefs - and thus, should experience improved beliefs if treated - tend to have more liberal preferences than those who hold positively inflated beliefs. On

average, people holding negatively inflated beliefs have social preferences of 50 on a scale of 0 to 100, where 0 corresponds to liberal preferences and 100 to conservative preferences. In contrast, people holding positively inflated beliefs have social preferences of 55. For economic preferences, people holding negatively inflated beliefs have economic preferences of 57, and people holding positively inflated beliefs have preferences of 62. We also test for differences in means between both group's respective control and treatment groups and present the associated *p-values* in the Table. Given the process of randomization, these groups are comparable to the others. In some instances where differences exist, we include a full suite of individual-level covariates in our primary specification to adjust for these imbalances. Throughout the paper, results are robust to this check.

Regarding preferences for the two spending categories, the negatively inflated group reports that for a given \$100, they prefer that \$64.19 are allocated for education programs and \$35.81 are allocated towards payments towards the federal debt. At the same time, they expect \$24.42 and \$75.58 to each, respectively. Hence, the reported difference between preferences and expectations is \$39.77. In 2019, the government actually allocated \$63 towards debt repayment and \$37 towards education programs. In light of this, the real difference between an individual's preferences is only \$27.19, indicating that beliefs for this group are on average negatively inflated by \$12.58.

The positively inflated group has preferences of \$66.96 for education and \$33.03 for debt payments. It expects the government to allocate \$60.47 and \$39.53 to each, respectively, meaning that beliefs are on average positively inflated by \$23.47. Interestingly, both groups report very similar preferences for spending allocations but have drastically different beliefs consistent with literature documenting how many view reality through a different 'lens' (Alesina et al., 2020; McNamara and Mosquera, 2022).

4.2 Treatment Effects on Stated Behaviors

We now focus on evaluating how our treatment, which improves or worsens beliefs, impacts individual behaviors.²¹ In this section, we investigate differential treatment effects on outcomes reported from our primary survey using the three indices of interest defined in Section 2: i) government support, ii) tax perceptions, and iii) affective polarization. In the following section, we look at behavioral responses in the form of filing taxes. Table 2 presents the estimates of our primary specification on the three indices across our sample.

As indicated in the table, the top panel - Panel (a) - estimates the effects of beliefs that should be improved for the negatively inflated belief group, and the bottom panel, (b), estimates the effects of beliefs that should be worsened for the positively inflated belief group. Improving beliefs results in a 0.30 s.d. ($se = 0.15$) increase in government support, a 0.24 s.d. ($se = 0.11$) increase in tax perceptions, and a 0.40 s.d. ($se = 0.16$) reduction in feelings of affective polarization.²² ²³ In summary, when beliefs about government spending are likely to improve, this induces more positive feelings across the full suite of outcomes. However, when beliefs about government spending are likely to worsen, we do not observe any significant changes. We supplement these estimates with their bounds to gauge the impact of non-random attrition (Lee, 2009). For the improved belief group, positive (negative) treatment effects have significant upper (lower) bounds and insignificant lower (upper) bounds, which are consistent with the main point estimates discussed above. For the worsened belief group, the bounds are consistent with insignificant effects. In both cases, the bounds suggest that

²¹We also exploit this experiment to replicate the results in McNamara and Mosquera (2022). There are differences in the questionnaire that make an exact replication unfeasible. We document similar differences between preferences and beliefs as in McNamara and Mosquera (2022). Revealing reality via our information intervention does mend the gaps significantly but does not result in complete convergence between the two groups. This suggests that differences in beliefs explain most of the difference between groups, but there are other systematic differences between the two groups in the Ecuador sample. Appendix E presents the replication results.

²²The robustness of these results is discussed in Appendix Section B. In summary, to address small imbalances between treatment and control groups, results are consistent when including all available individual-level covariates. Similarly, estimates are robust to various tests of data quality.

²³These results are still significant at the 10 percent level after controlling for the potential of false discovery following Anderson (2008).

Table 2: Treatment Effects of Information on Stated Behaviors

	Support Index	Tax Index	Polarization Index
<i>Panel (a): Improved Beliefs (N=729)</i>			
Information Treatment	0.30** (0.15)	0.24** (0.11)	-0.40** (0.16)
<u>Lee Bounds:</u>			
Lower Bound	-0.09 (0.16)	-0.08 (0.12)	-0.89*** (0.17)
Upper Bound	0.72*** (0.16)	0.55*** (0.12)	0.10 (0.19)
<i>Panel (b): Worsened Beliefs (N=1,173)</i>			
Information Treatment	-0.13 (0.13)	0.03 (0.09)	0.08 (0.12)
<u>Lee Bounds:</u>			
Lower Bound	-0.62*** (0.15)	-0.26*** (0.10)	-0.35*** (0.13)
Upper Bound	0.33** (0.15)	0.44*** (0.11)	0.51*** (0.13)

*Notes: This table presents the treatment-on-the-treated effects of our experimental information provision on various indices, including government support, tax perceptions, and affective polarization. *** (**) [*] indicates significance at 1% (5%) [10%]. Standard errors are presented in parentheses.*

attrition has little to no impact on the direction of the estimated effects. Interpreting these results from a social welfare perspective, we document a Pareto improvement, even if just for one portion of the sample.

The results for affective polarization imply that revealing accurate information about government policy improves feelings for one side while not changing those for the other. Since both groups are comprised of both liberals and conservatives, we document heterogeneity in treatment effects in panel (b) of Appendix Table A.4 to more closely understand affective

polarization.²⁴ However, there are no significant differences between the two indicating that improving beliefs for both liberals and conservatives reduces polarization while worsening beliefs has no impact.²⁵ This contributes to a more nuanced result in understanding affective polarization. While Druckman et al. (2022) document that partisans tend to misestimate the political extremity of out-partisans and that this can be moderated by revealing ‘reality,’ our results - using perceptions towards government spending as the moderator - confirm that when revealing ‘reality’ improves beliefs, feelings of affective polarization are attenuated. However, revealing ‘reality’ does not move polarization when beliefs are worsened. This result echoes some of the complications found by Druckman et al. (2022) - is good citizenship someone who gets along with out-partisan groups or someone whose beliefs and corresponding actions are a function of and reflect their preferences for government policy?

While asymmetric responses have been documented in the literature, they are typically more pronounced for negative treatments over positive treatments (Soroka, 2006; Sunstein et al., 2017). However, Eil and Rao (2011) document the opposite, that receiving good news results in a Bayesian-like update. However, negative news does not move the needle, potentially revealing a similar pattern in our results. Alternatively, it could be the case that the two groups have different preference orderings over a large set of policy views and that moving beliefs on some aspects does not correspond to changes across the spectrum of behaviors.

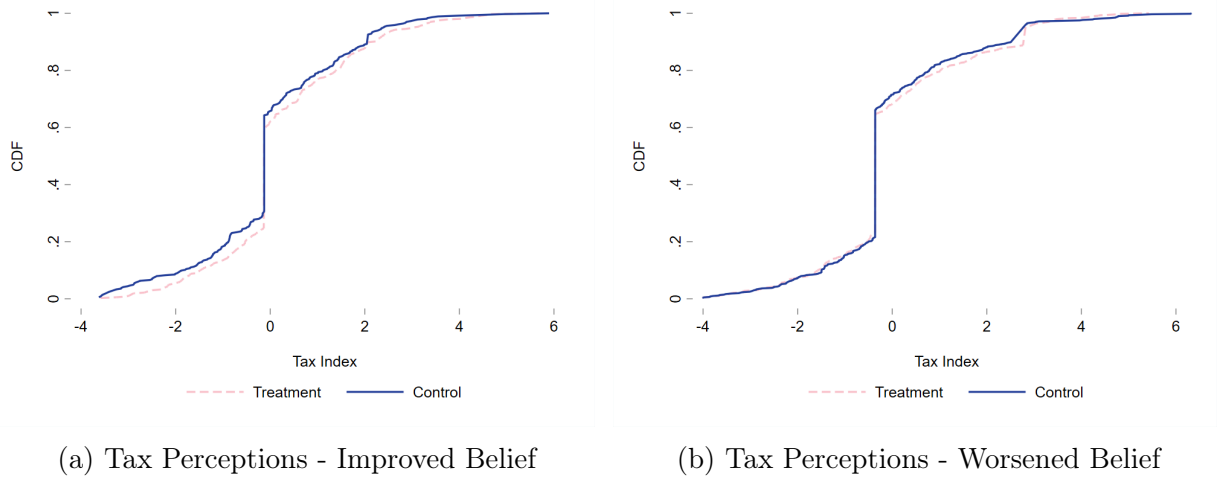
Beyond testing for mean effects, we also look at effects on the entire distribution of outcomes.²⁶ In Figure 2, we present these results for the Tax Perceptions Index since this outcome is closely associated with the behavioral tax filing outcomes discussed in the follow-

²⁴In practice, heterogeneity is investigated by including an interaction term corresponding to the characteristic of interest in the primary specification (1). More generally, the heterogeneity of results provides an additional robustness check for our primary findings. Across the three significant index outcomes and ten heterogeneous characteristics, nearly all result in treatment effects that go in the same direction as the main result.

²⁵Perhaps most striking are the particularly strong effects on the Support and Polarization indices for women and the effects of education on these two indices.

²⁶See panel (a) of Appendix Table A.6 for tabular results.

Figure 2: Distributional Effects on Tax Perceptions



Notes: This figure presents the effects of perception changes on an index collecting information related to tax perceptions. Effects are presented at the distributional level.

ing section.²⁷ Panel (a) in Figure 2 shows distributional effects for the tax perceptions index for the negatively inflated belief group. We use Kolmogorov-Smirnov-based statistics to test for equality and first and second-order stochastic dominance. Overall, the treated distribution has first-order dominance ($p\text{-value}=0.06$) and second-order dominance ($p\text{-value}=0.00$). Hence, across the distribution, improving beliefs correspond to an improved perception of paying taxes and is even more pronounced for those on the left tail. This result is supported by the findings in Cummings et al. (2009), who document the relationship between tax morale and tax compliance. When breaking this index into its component questions (Appendix Figure A.3), this effect is positive for all four questions, but especially so for the *TaxesFair* question (“How fair do you think our present federal tax system is?”).²⁸

4.3 Treatment Effects on Tax Filing

In this section, we exploit the timing of our intervention to estimate whether the information treatment - which is likely to change perceptions and beliefs about the government

²⁷Appendix Figure A.2 presents distributional effects for the Support Index and the Polarization Index.

²⁸More generally, Appendix Figure A.3 presents treatment effects for each outcome question within the three indices. As an additional robustness check, nearly all of the estimates on the outcomes questions have the same effect direction as the overall index itself.

- also affects filing income taxes. As previously described, in Ecuador, self-employed individuals have to report their earnings to Ecuador’s IRS three times. The first time is in July when individuals report their first semester earnings. The second time is in January next year when individuals report their second semester earnings. Finally, individuals file their final tax report in March, where total earnings must match the sum of the two previous filings. We ran our main intervention in July 2021 with the intention of testing if changing perceptions about the government can create a behavioral response in tax filing.

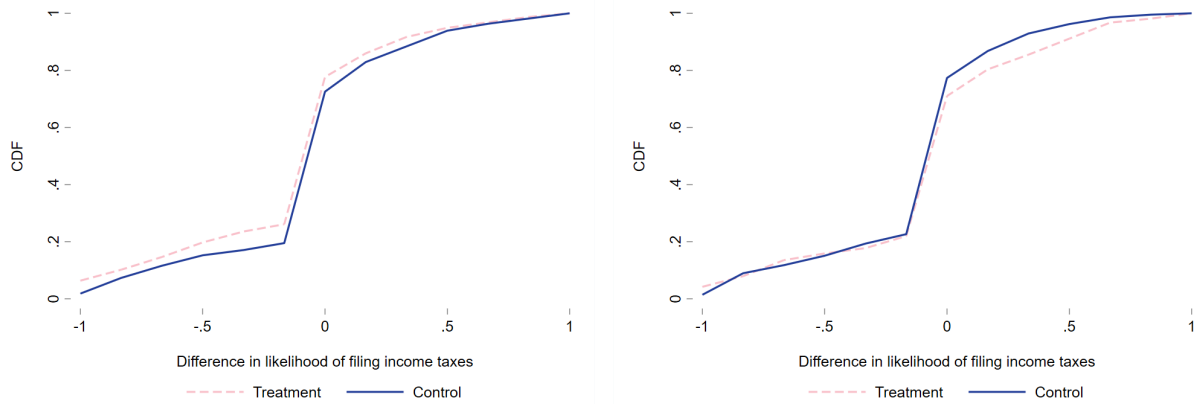
The second to last digit of an individual’s national identification number determines the maximum date in the tax reporting month when they should file the tax forms. We restrict the sample to individuals who completed our questionnaire before their tax deadline. This restriction leaves us with a sample of 747 individuals. To maximize power, we focus on testing for treatment effects in distributional differences, first-order stochastic dominance, and second-order stochastic dominance (Abadie, 2002). We also do not observe any significant differences between those who complete the experimental survey and those who completed our questionnaire before their tax deadline (Appendix Table A.5). Hence, we report results as expressed in Section 3.

We study first if changing perceptions about the government affects the probability of filing income tax.²⁹ For each individual, we calculate the difference between an indicator of filing taxes in 2021 and the average likelihood of filing taxes in 2015–2020.³⁰ Figure 3, panels (a) and (b) plot the distribution of this difference for individuals for whom treatment should have improved their perceptions about the government (Panel a) and individuals for whom treatment should have worsened their perceptions about the government (Panel b). Panel (a) shows that for individuals for whom treatment should have improved their perceptions about the government, getting treated shifts the distribution to the left, suggesting that improving perceptions about the government makes these individuals less likely to file their

²⁹See panel (b) of Appendix Table A.6 for tabular results.

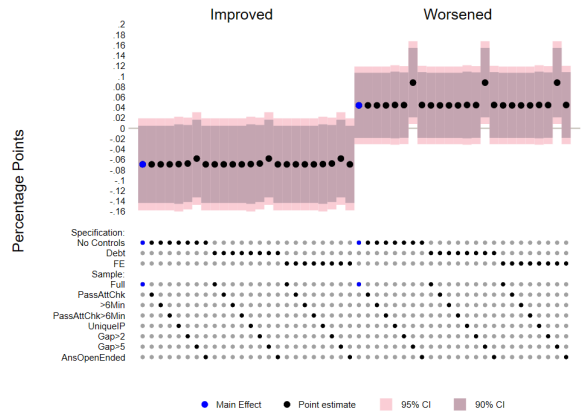
³⁰This is implemented by calculating the mean of an indicator for whether an individual filed taxes for each of these years.

Figure 3: Effects on Tax Filing



(a) Filing Taxes - Improved Beliefs

(b) Filing Taxes - Worsened Beliefs

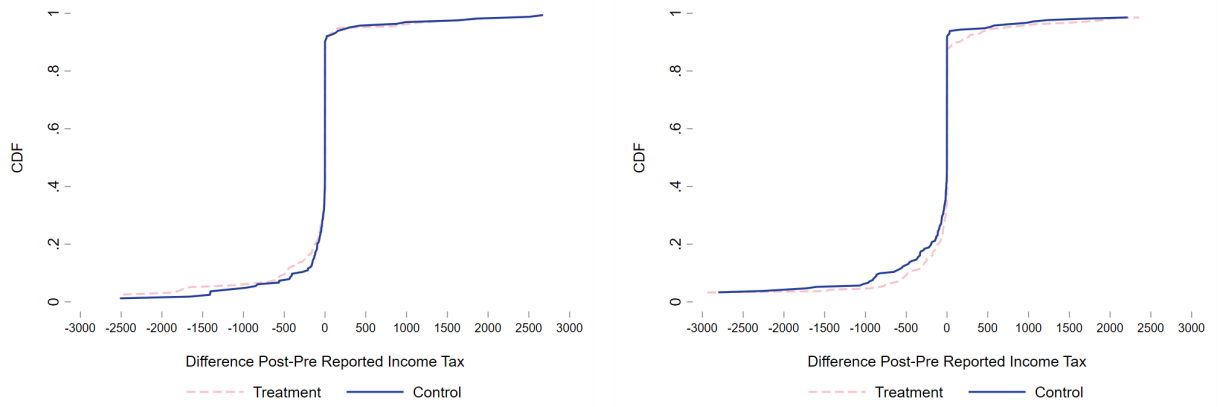


(c) Average treatment effects

Notes: This figure presents the effects of perception changes on tax filing. The first two panels show these effects for the difference in filing taxes distribution between a pre-intervention period (2015–2020) and a post-intervention period (2021). The third panel presents average treatment effects. In Panel (a), The distribution of the control group has second-order stochastic dominance over the distribution of the treatment group (p – value = 0.041). In Panel (b), The distribution of the treated group has first-order stochastic dominance over the distribution of the control group (p – value = 0.064).

income tax. The distribution of the control group has second-order stochastic dominance over the distribution of the treatment group (p value = 0.041), indicating that the plotted differences are statistically significant. Panel (b) shows the opposite effect for individuals for whom treatment should have worsened their perceptions about the government; getting treated shifts the distribution to the right, suggesting that worsening perceptions about the government make them more likely to file their income tax. The distribution of the

Figure 4: Effects on Tax Filing



(a) Reported Income Tax - Improved Perception (b) Reported Income Tax - Worsened Perception

Notes: This figure presents the effects of perception changes on reported income tax. The panels show these effects for the difference in reported income tax taxes distribution between a pre-intervention period (2015–2020) and a post-intervention period (2021).

treated group has first-order stochastic dominance over the distribution of the control group (p value = 0.064). Panel (c) shows the average treatment effect for both groups. Improving perceptions about the government decreased the likelihood of filing taxes by 6.9 percentage points, and worsening perceptions about the government increased the likelihood of filing taxes by 4.4 percentage points. We are under-powered to detect statistical significance, but these effects are large compared to baseline levels, representing 9.2 percent and 6.1 percent of the likelihood of filing taxes for each group in 2015–2020.³¹ These effects are robust to controlling for individual fixed effects, the order of the spending categories, and samples.³²

We then study if, conditional on filing taxes, there is an effect on the income tax reported. There is an additional challenge to identifying this effect. Since treatment affects the probability of filing taxes, it causes a sample selection problem. Treatment is selecting the individuals for whom we observe reported taxes. For this reason, this analysis is only suggestive of the presence of an intensive margin effect of changing perceptions about the

³¹The minimum detectable effect with 80 percent power is 0.122 for the first group and 0.116 for the second group.

³²Once we restricted the sample to individuals who included a valid national ID number in the survey and completed our questionnaire before their tax deadline, all individuals passed the attention checks and took more than 6 minutes to complete the survey.

government on tax behavior, and we focus only on distributional effects.

We calculate the difference between reported income tax in 2021 and the average reported tax in 2015–2020. Figure 4, panels (a) and (b) plot the distribution of this difference for individuals for whom treatment should have improved their perceptions about the government (Panel a) and individuals for whom treatment should have worsened their perceptions about the government (Panel b). Panel (a) shows that for individuals for whom treatment should have improved their perceptions about the government, there are no differences between treated and control individuals. We cannot reject that the distributions for treated and control individuals are the same (p value = 0.686). This result suggests that improving perceptions about the government reduces the likelihood of filing taxes but does not affect the amount reported for those who do file their taxes.

In contrast, panel (b) shows that for individuals for whom treatment should have worsened their perceptions about the government, getting treated shifts the distribution to the right. The distribution of the treated group has first-order stochastic dominance over the distribution of the control group (p value = 0.028). This result suggests that worsening perceptions about the government increase reported income tax. However, given sample selection concerns and lack of power, it is not possible to draw more robust conclusions.

5 Discussion and Conclusion

In this paper, we study how factual information about a government’s expenditures affects government support and polarization, specifically related to tax payments. We identify individuals who have either *Negatively Inflated Beliefs* or *Positively Inflated Beliefs* about the government by comparing an individual’s current preferences and expectations to those who are provided information from a more global perspective. We ran a survey experiment to test if providing information can affect stated beliefs and behavioral responses regarding tax payments. For the first group, providing global factual information about government expenditures should improve local perceptions about the government. This result holds in

terms of stated government support and perceptions of paying taxes. We also find that factual information decreases a measure of affective polarization. However, the estimates suggest that these individuals were less likely to file income tax returns.

For the *Positively Inflated Beliefs* group, providing global factual information about government expenditures should worsen local perceptions about the government. We do not find this effect in terms of stated beliefs. Worsening beliefs do not significantly change our measure of government support, perceptions of paying taxes, and our measure of affective polarization. However, the estimates suggest that these individuals were more likely to file income tax returns and, conditional on filing, declared higher taxes.

This initial set of results is robust to a large set of tests, including tests for selection, attrition, multiple hypotheses, sample imbalances between control and treatment groups, data quality, index construction, and heterogeneity. These have been referenced when applicable, and a detailed discussion is provided in Appendix Section B. An additional concern might stem from the role of demand effects. However, several empirical results mitigate this concern, including the asymmetry between the two sets of results and the free-riding behavioral result, where real choices that are not directly linked to survey completion echo the asymmetry found in the first part of the experiment.

The two sets of results can be rationalized using a conceptual framework that integrates two theoretical models of tax compliance. First, compliance can be modeled as a utility maximization problem where the decision to (under)report is a function of expected benefits and costs (Allingham and Sandmo, 1972). Empirically, this simple model better represents non-compliance distribution when including additional factors, such as the psychological, moral, and “conscience” costs associated with non-compliance. Other behavioral factors that could improve this model may include an individual’s evaluation of the fairness of the tax code or their evaluation of government expenditures and corruption (Andreoni et al., 1998). However, these basic predictions are inconsistent with some of the results found in this paper – our results show that those with a better evaluation of government expenditures possibly

comply less – as well as those found in Scholz and Lubell (1998), who find that increases in political efficacy correspond to higher levels of non-compliance. To rationalize these differences, we integrate results from the literature that investigates individual contributions in public goods games and the role of cooperation, threshold uncertainty, and perceived-pivotalness (Nitzan and Romano, 1990; Suleiman, 1997; Suleiman et al., 2001). Perhaps most consistent with our results, McBride (2006) documents a positive relationship between contributions, an individual’s perception of being pivotal, and threshold uncertainty. In essence, the results presented in this paper can be interpreted as for treated individuals in the *Negatively Inflated Beliefs (Positively Inflated Beliefs)* group, perceptions towards spending allocations should improve (worsen) relative to what was initially expected, and thus, their probability of being the pivotal contributor is lower (higher). This can result in “paying” a lower (higher) “conscience” cost, thus incentivizing more (less) free-riding.

The results on stated beliefs resonate with a large literature on public communication. Public communication between a government and its people can have important economic consequences. The internet and social media have created a direct path of communication that removes traditional media as a necessary middle-man (Hong, 2013; Graham and Avery, 2013; Graham, 2014; Liu et al., 2012; Dutil et al., 2008; Bimber, 1999). When this channel works well, effective communication can foster long-term economic growth and creates stability during crisis events (Grimmelikhuijsen, 2009; Hyland-Wood et al., 2021; Blair et al., 2017; Beugelsdijk et al., 2004; Whiteley, 2000; Serritzlew et al., 2014). When it does not, economies may suffer from corruption and social instability through protests and riots (Kolstad and Wiig, 2009; Hollyer et al., 2013). Our results suggest that increased transparency between a government and citizens may have positive outcomes regarding stated government support, have better perceptions towards paying taxes and think better of others who hold different political views than themselves. However, policymakers should weigh these gains in beliefs and perceptions against behavioral changes that may decrease society’s welfare, such as free-riding.

From a policy perspective, the behavioral results on tax reporting and payment suggest that providing information on how the government spends tax payments (tax receipts) may unintentionally induce free-riding behavior. These policies seek to increase transparency on the government's doings and improve support. On the one hand, for individuals whose prior perceptions about the government were overly negative, the results suggest that providing information will improve them. However, regarding tax-paying behavior, feeling better about the government's expenditure may induce free-riding. On the other hand, the results suggest that providing information will not affect prior perceptions of overly optimistic individuals about the government. However, regarding tax-paying behavior, feeling worse about the government's expenditure may increase tax reporting and payments. Thus, whether these policies increase or decrease overall tax reporting and payments depends on the underlying distribution of beliefs about the government.

Our information experiment has some similarities with tax receipts used by government agencies. For instance, receipts are sent in Australia before individuals file their taxes. Similarly, we sent the survey before individuals had to submit their July and January income reports. However, there are differences between our design and an actual tax receipt that prevent us from drawing more than suggestive conclusions. First, we reveal information about two expenditure categories, while tax receipts cover all government expenditures. Second, in this paper, the information comes from researchers, while a government agency submits actual tax receipts. Individuals may react differently to information the government reveals, which they might perceive as more or less trustworthy than a research team. Third, our treatment is a small nudge compared to receiving an official letter from the government's tax collection agency. These caveats reinforce the need for future research in collaboration with a governmental tax collections agency to test how tax receipts affect tax reporting and collections. While these policies may improve perceptions about the government, they may also induce free-riding, which could hamper collection efforts.

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A Appendix Tables and Figures

Table A.1: Sample Selection

	Did Not Participate	Participated
% Women*	0.45 (0.50)	0.40 (0.49)
Age in years*	45.20 (13.35)	42.89 (12.40)
% non-Ecuadorian	0.04 (0.19)	0.02 (0.14)
% Married*	0.87 (0.34)	0.88 (0.32)
% College or more	0.40 (0.49)	0.62 (0.49)
% Filed taxes in 2018*	0.42 (0.49)	0.50 (0.50)

*Notes: This table presents summary statistics between participants opting in/out of the experiment. Standard deviations in parenthesis. * indicates variable not available if a participant did not provide their RUC.*

Table A.2: Sample Attrition

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Pooled Sample	Finished	Not Finished (Total)	p-value	Not Finished (Before Game)	p-value	Not Finished (Thru Game)	p-value	Not Finished (After Game)	p-value
% Women*	0.40 (0.49)	0.40 (0.49)	0.43 (0.50)	0.16	0.39 (0.49)	0.97	0.48 (0.50)	0.21	0.47 (0.50)	0.07
Age in years*	42.89 (12.40)	42.79 (12.33)	43.22 (12.68)	0.52	41.90 (12.48)	0.30	47.70 (12.58)	0.00	43.60 (12.70)	0.41
% non-Ecuadorian	0.16 (0.37)	0.15 (0.35)	0.21 (0.41)	0.00	0.19 (0.40)	0.05	0.25 (0.44)	0.04	0.22 (0.42)	0.01
% Married*	0.75 (0.43)	0.77 (0.42)	0.72 (0.45)	0.02	0.72 (0.45)	0.12	0.72 (0.45)	0.41	0.71 (0.46)	0.06
Number of children	1.48 (1.41)	1.48 (1.42)	1.48 (1.37)	0.99	1.32 (1.45)	0.14	1.67 (1.39)	0.25	1.55 (1.28)	0.40
% College or more	0.70 (0.46)	0.71 (0.45)	0.65 (0.48)	0.01	0.60 (0.49)	0.00	0.67 (0.47)	0.42	0.69 (0.47)	0.41
Hispanic	0.88 (0.33)	0.92 (0.28)	0.76 (0.43)	0.00	0.63 (0.48)	0.00	0.92 (0.28)	0.99	0.88 (0.32)	0.14
%Urban	0.81 (0.39)	0.84 (0.36)	0.70 (0.46)	0.00	0.57 (0.50)	0.00	0.69 (0.46)	0.01	0.88 (0.33)	0.19
%SubUrban	0.09 (0.28)	0.09 (0.29)	0.08 (0.27)	0.28	0.06 (0.24)	0.03	0.19 (0.40)	0.03	0.06 (0.25)	0.12
%Rural	0.07 (0.25)	0.06 (0.25)	0.07 (0.25)	0.67	0.07 (0.25)	0.92	0.11 (0.32)	0.21	0.06 (0.24)	0.82
Vote Lasso	0.63 (0.48)	0.68 (0.47)	0.46 (0.50)	0.00	0.27 (0.44)	0.00	0.58 (0.50)	0.12	0.67 (0.47)	0.82
News Bias	56.91 (18.43)	57.21 (18.29)	55.53 (19.02)	0.10	56.40 (17.48)	0.62	55.28 (19.90)	0.41	55.17 (19.54)	0.13
Social Views	53.00 (22.66)	53.18 (22.60)	52.19 (22.93)	0.42	52.51 (23.01)	0.76	50.19 (25.51)	0.32	52.65 (22.10)	0.73
Econ Views	59.38 (23.14)	60.11 (23.14)	56.08 (22.87)	0.00	55.94 (22.38)	0.05	56.83 (24.61)	0.26	55.91 (22.64)	0.01
% Filed taxes in 2018*	0.50 (0.50)	0.51 (0.50)	0.49 (0.50)	0.54	0.51 (0.50)	0.98	0.44 (0.50)	0.36	0.48 (0.50)	0.54
N	2,495	1,902	593		289		72		232	

Notes: This table presents summary statistics for the pooled sample (1), statistics for those who finished in (2), and for those who did not complete the survey at various stages in (3), (5), (7), and (9). Columns (4), (6), (8), and (10) present the p-value for a test in differences between the preceding column and the sample that finished as in (2). Standard deviations in parenthesis. * indicates variable not available if a participant did not provide their RUC.

Table A.3: Treatment Effects on Indices

	(1)	(2)	(3)	(4)	(5)	(6)
	Improved Beliefs			Worsened Beliefs		
	Support Index	Tax Index	Polarization Index	Support Index	Tax Index	Polarization Index
Panel (a): No Controls						
Primary Specification	0.30 (0.150)	0.24 (0.108)	-0.40 (0.162)	-0.13 (0.132)	0.03 (0.090)	0.08 (0.119)
Panel (b): Added Control Variables						
Gov. Representation	0.12 (0.124)	0.19 (0.106)	-0.34 (0.160)	-0.02 (0.105)	0.06 (0.087)	0.05 (0.116)
Political Controls	0.20 (0.139)	0.21 (0.162)	-0.37 (0.162)	-0.10 (0.125)	0.05 (0.089)	0.07 (0.118)
Demographics	0.29 (0.153)	0.19 (0.117)	-0.38 (0.178)	-0.17 (0.125)	0.05 (0.093)	0.08 (0.122)
All	0.22 (0.135)	0.18 (0.116)	-0.36 (0.176)	-0.08 (0.109)	0.07 (0.091)	0.05 (0.119)
Panel (c): Data Quality Subgroups						
Pass Attention Check	0.48 (0.190)	0.42 (0.165)	-0.54 (0.244)	-0.17 (0.183)	0.02 (0.154)	0.10 (0.216)
>7 Min	0.35 (0.158)	0.25 (0.118)	-0.45 (0.177)	-0.20 (0.138)	0.03 (0.099)	0.09 (0.132)
Pass Attention & >7 Min	0.48 (0.190)	0.42 (0.165)	-0.54 (0.244)	-0.17 (0.183)	-0.01 (0.154)	0.12 (0.217)
UniqueIP	0.30 (0.160)	0.23 (0.117)	-0.36 (0.170)	-0.19 (0.140)	0.05 (0.095)	0.09 (0.125)
Gap >2	0.32 (0.152)	0.21 (0.110)	-0.37 (0.165)	-0.14 (0.132)	0.03 (0.090)	0.09 (0.119)
Gap >5	0.30 (0.153)	0.19 (0.110)	-0.34 (0.166)	-0.22 (0.147)	-0.03 (0.099)	0.22 (0.130)
AnsOpenEnded	0.49 (0.191)	0.42 (0.166)	-0.56 (0.244)	-0.20 (0.184)	0.01 (0.156)	0.13 (0.218)

Notes: This table presents the treatment on the treated effects for the improved belief group in columns (1) through (3), and for the worsened belief group in columns (4) through (6). Panel (a) documents the main specification without any added control variable. Panel (b) presents effects when including a suite of various individual-level covariates. Panel (c) presents robustness checks across various subgroups. Standard errors in parenthesis.

Table A.4: Heterogenous Treatment Effects on Indices

	(1)	(2)	(3)	(4)	(5)	(6)
	Improved Beliefs			Worsened Beliefs		
	Support Index	Tax Index	Polarization Index	Support Index	Tax Index	Polarization Index
<i>Panel (a): Main</i>						
Primary Specification	0.30 (0.150)	0.24 (0.108)	-0.40 (0.162)	-0.13 (0.132)	0.03 (0.090)	0.08 (0.119)
<i>Panel (b): Heterogenous Effects</i>						
Hispanic	0.37 (0.141)	0.22 (0.098)	-0.33 (0.149)	-0.07 (0.120)	0.09 (0.082)	-0.01 (0.108)
Non Hispanic	-0.23 (0.466)	0.03 (0.367)	-0.45 (0.474)	-0.59 (0.375)	-0.28 (0.284)	0.31 (0.293)
Young Age	0.41 (0.217)	0.01 (0.143)	-0.33 (0.231)	-0.15 (0.163)	0.14 (0.112)	-0.02 (0.148)
Old Age	0.26 (0.173)	0.33 (0.126)	-0.36 (0.182)	-0.09 (0.160)	-0.05 (0.109)	0.04 (0.138)
Liberal	0.20 (0.165)	0.19 (0.121)	-0.29 (0.181)	0.06 (0.167)	0.19 (0.113)	-0.06 (0.145)
Conservative	0.28 (0.207)	0.15 (0.147)	-0.39 (0.234)	-0.22 (0.147)	-0.06 (0.110)	0.07 (0.141)
No College Degree	0.56 (0.271)	0.20 (0.184)	0.10 (0.268)	-0.09 (0.213)	0.09 (0.142)	-0.15 (0.161)
College Grad	0.26 (0.154)	0.19 (0.109)	-0.53 (0.167)	-0.12 (0.136)	0.04 (0.095)	0.08 (0.127)
Male	0.16 (0.194)	0.24 (0.135)	-0.21 (0.197)	-0.07 (0.163)	0.06 (0.109)	0.02 (0.145)
Female	0.80 (0.236)	0.07 (0.171)	-0.66 (0.267)	-0.35 (0.180)	0.03 (0.132)	0.00 (0.154)

Notes: This figure presents heterogenous treatment-on-the-treated effects on indices pertaining to individual beliefs, including government support, tax perceptions and political polarization. Panel (a) presents primary results following our primary specification. Panel (b) presents various heterogenous estimates by interacting the treatment indicator with each respective characteristic. Standard errors in parentheses.

Table A.5: Sample Attrition for Tax Data

	Completed survey	Tax Data
% Women*	0.40 (0.49)	0.39 (0.49)
Age in years*	42.79 (12.33)	41.64 (11.35)
% non-Ecuadorian	0.15 (0.35)	0.12 (0.33)
% Married*	0.77 (0.42)	0.78 (0.42)
Number of children	1.48 (1.42)	1.37 (1.39)
% College or more	0.55 (0.50)	0.64 (0.48)
Hispanic	0.92 (0.28)	0.92 (0.26)
%Urban	0.84 (0.36)	0.85 (0.36)
%SubUrban	0.09 (0.29)	0.09 (0.29)
%Rural	0.06 (0.25)	0.06 (0.23)
Vote Lasso	0.68 (0.47)	0.71 (0.45)
News Bias	57.21 (18.29)	58.49 (17.79)
Social Views	53.18 (22.60)	52.40 (22.49)
Econ Views	60.11 (23.14)	61.71 (23.31)
% Filed taxes in 2018*	0.51 (0.50)	0.58 (0.49)

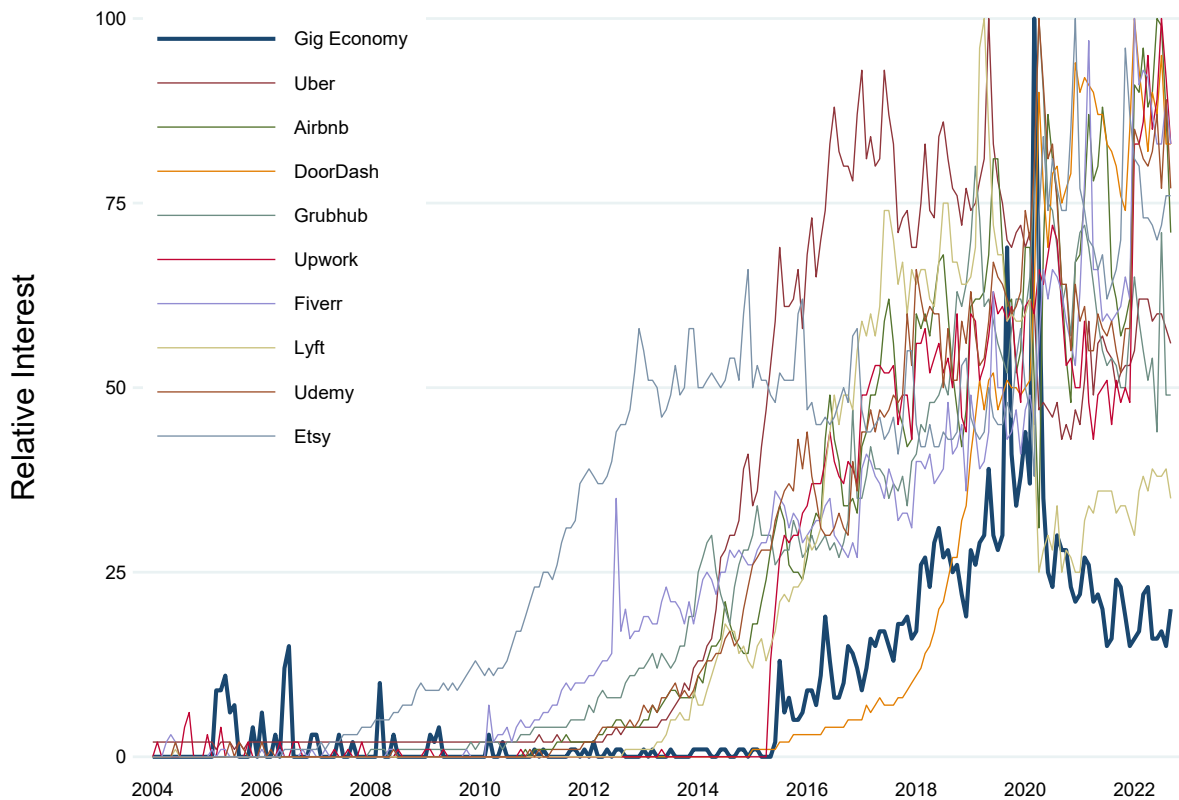
*Notes: This table presents summary statistics between participants who completed the experimental survey and those who completed our questionnaire prior to filing taxes. Standard deviations in parenthesis. * indicates variable not available if participant did not provide their RUC.*

Table A.6: Distributional Effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Improved Beliefs					Worsened Beliefs				
	Equality	FSD C-T	SSD C-T	FSD T-C	SSD T-C	Equality	FSD C-T	SSD C-T	FSD T-C	SSD T-C
<i>Panel (a): Outcome Questionnaire</i>										
Government Support Index	0.125	0.990	0.868	0.056	0.002	0.268	0.121	0.044	0.671	0.541
Tax Perception Index	0.117	0.991	0.952	0.059	0.001	0.516	0.616	0.447	0.262	0.150
Affective Polarization Index	0.021	0.009	0.000	0.923	0.738	0.720	0.936	0.738	0.390	0.157
<i>Panel (b): Tax Filing</i>										
Present Tax	0.287	0.130	0.041	0.955	0.998	0.126	0.591	0.548	0.064	0.114
Income Tax	0.692	0.385	0.193	0.646	0.730	0.049	0.971	0.876	0.030	0.000

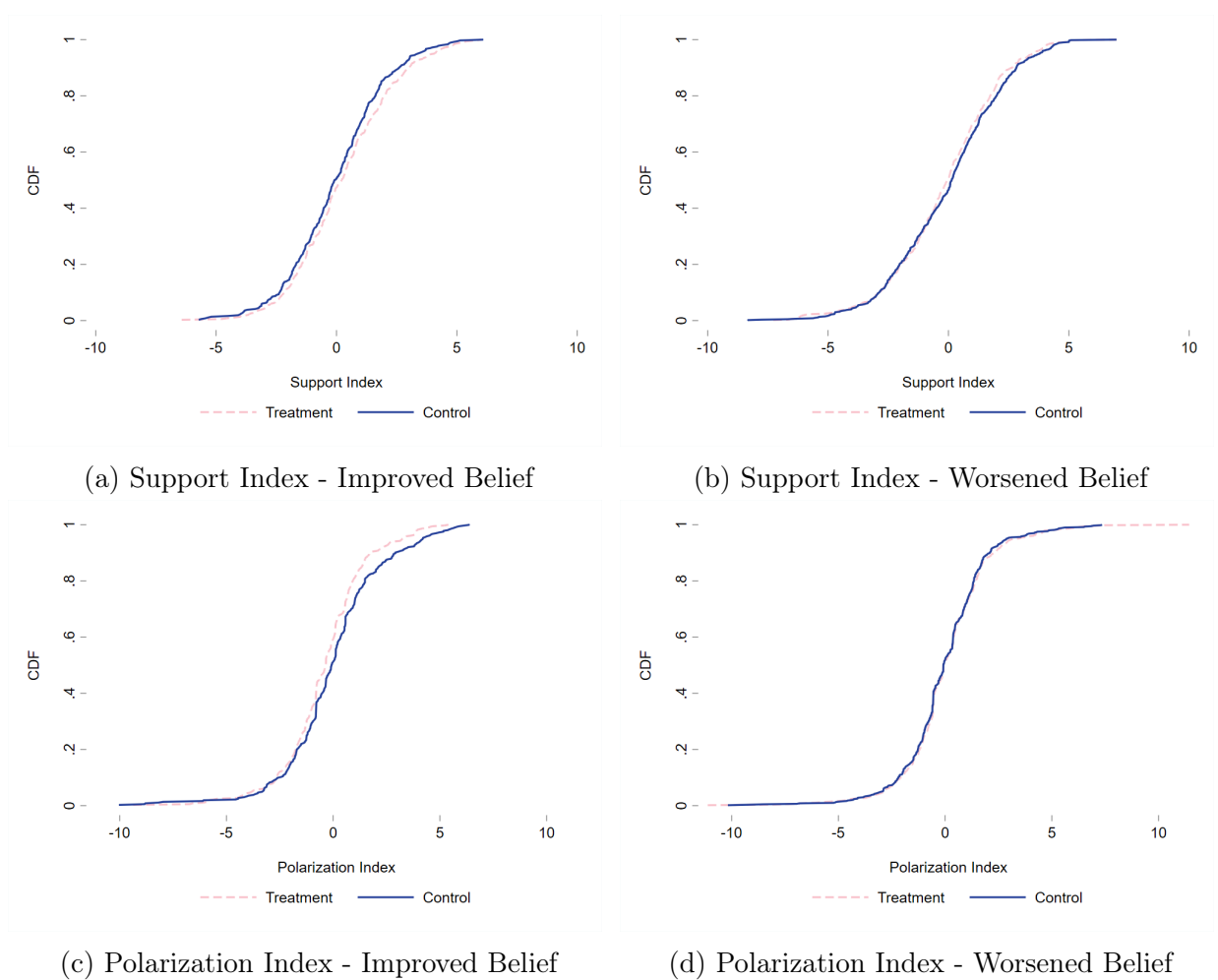
Notes: This table presents the bootstrap p-values of Kolmogorov-Smirnov statistics that test for equality of distributions, first order stochastic dominance (FSD) and second order stochastic dominance (SSD) between treatment and control. Panel (a) presents these for the Improved Belief group (columns (1) through (5)) and for the Worsened Belief group (columns (6) through (10)) for the outcome indices constructed from the outcome questionnaire. Panel (b) presents p-values for the tax filing effects.

Figure A.1: Gig Economy Interest Over Time



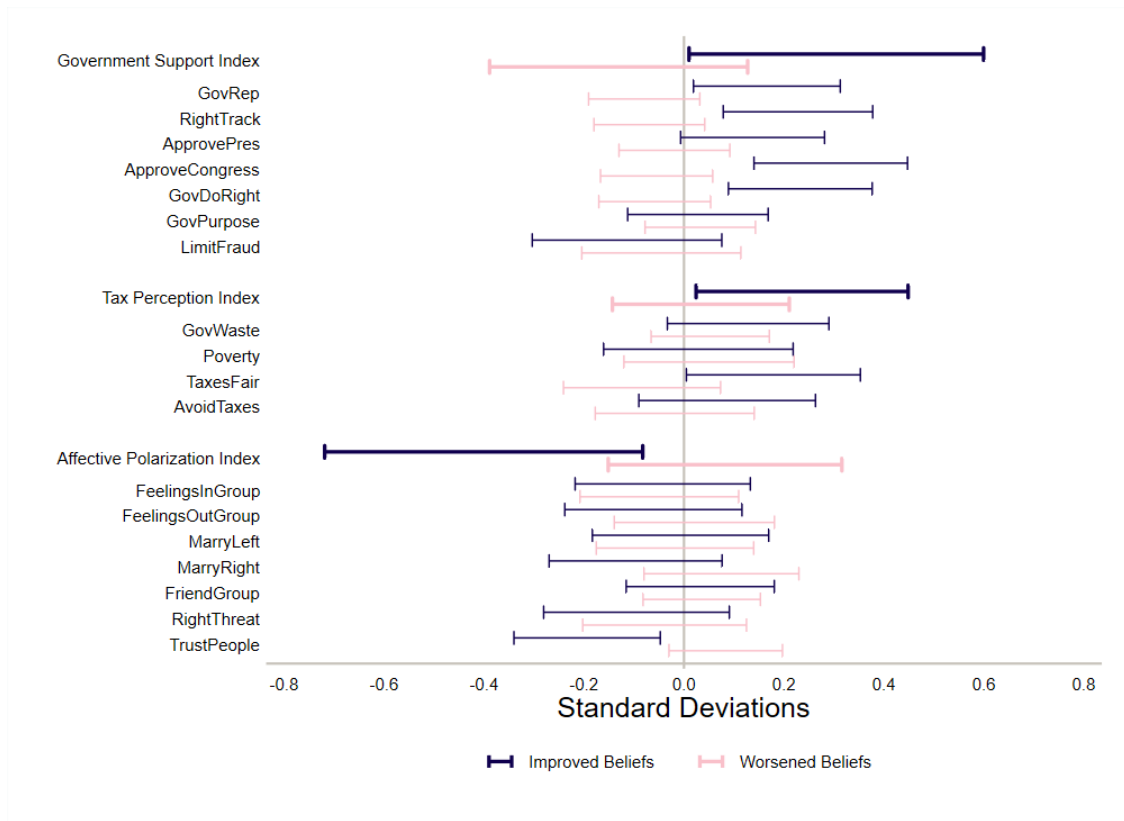
Notes: This figure plots the relative interest in various gig-work platforms and companies from 2004 to 2022. Data is from Google Trends. Interest is relative to each own's maximum, not the maximums across the entire set.

Figure A.2: Distributional Effects on Support and Polarization



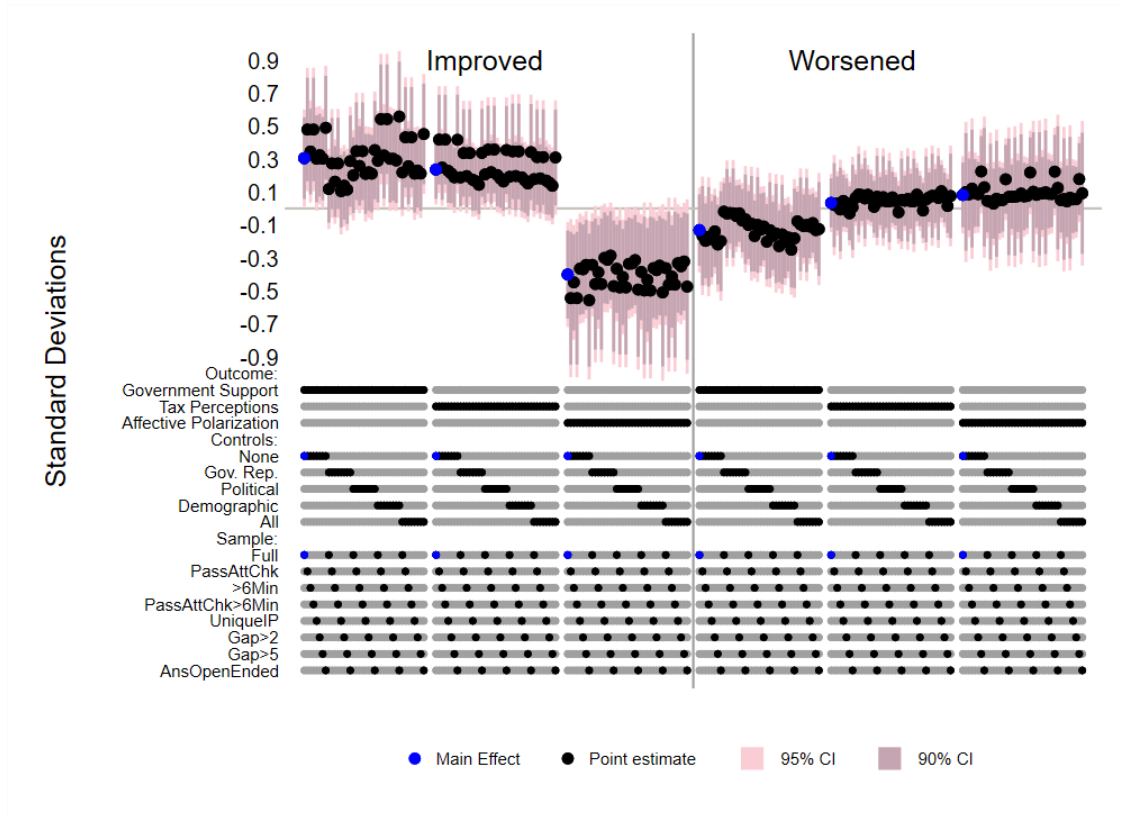
Notes: This figure presents treatment on the treated effects of the information intervention on the government support index and the polarization index. Effects are presented at the distributional level.

Figure A.3: Individual Outcomes for Indices



Notes: This figure presents the treatment-on-the-treated effects of perception changes on the individual outcome variables that comprise the main indices pertaining to individual beliefs, including government support, tax perceptions, and political polarization. 95 percent confidence intervals are displayed.

Figure A.4: Robustness of Treatment on the Treated Effects



Notes: This figure presents the treatment-on-the-treated effects of perception changes on various indices pertaining to individual beliefs, including government support and political polarization. Both 95 percent and 90 percent confidence intervals are displayed. Results are displayed for various robustness checks of the main index variables.

B Robustness Checks

We put the first set of results described above through a battery of tests to verify their robustness. For brevity, we report the majority of these checks in Appendix Figure A.4 for both the improved and worsened belief treatment groups for all three primary indices. Panels (b) and (c) of Appendix Table A.3 present tabular results.

As documented in Table 1, there are some small imbalances between each group’s control and treatment groups. To address this concern of sample composition, we include additional covariates such as political representation before treatment, political ideology, and basic demographics. Index estimates are overall robust to this concern. When it comes to survey data, there may be additional concerns related to data quality. For example, there may be a concern about lack of attention or focus, or even experimenter demand effects. We address the first part of this concern empirically and the second part intuitively. First, we restrict our experimental sample to focus on groups who pay the most attention. For example, we look at people who take more than 7 minutes to complete the survey, we look at people who pass all attention check questions, and we look at people who provide optional open ended answers. Across these subgroups and more, point estimates are robust to these checks. In some cases, standard errors are larger which reflects smaller sample sizes.

When it comes to experimenter demand effects, for this to bias results, there would either need to be differences in beliefs about what the research team wants between the control and treatment groups or it would need to be that participants understand they are in one specific group and change answers to reflect what they believe the research is seeking. There are several observations that suggest neither of these are the case. First, our recruitment email made no mention of the research, its objectives, or outcomes of interest. This was an intentional decision to prevent sample selection and to limit potential demand effects. In fact, we refer to the experiment as a survey to prevent participants from thinking they might receive different information relative to others. The decision to mention “political

preferences” in the introductory email was required for IRB approval so that participants could have some sense about what potential participation would encompass. Empirically, we find no systematic differences between the control and treatment group’s belief about the purpose of the study. Second, the asymmetry in results shows that for the worsened belief group, estimates do not go in their anticipated direction. This suggests that participants are not just updating in the treatment signal’s direction. Third, the free-riding behavioral result in the following section shows real decisions that are not directly linked to survey completion which echo the asymmetric responses we see in the outcome questionnaire.

As documented in Appendix Table A.1, there are some minor differences between participants and those who chose not to participate. On the one hand, our click through rate of 1.2 percent is comparable to industry standards suggesting that participants were no more or less likely to select into the sample based on this parameter. On the other, this potentially means that our results speak to a slightly more male and politically engaged sample than the entire population. When it comes to attrition, we find non-random attrition throughout the experimental survey (Appendix Table A.2), but do not find any significant attrition differences between the experimental survey and completing the second questionnaire and submitting tax payments naturally. In response to this, we provide bounded estimates following the procedure in Lee (2009) with our primary estimates in Table 2. Bounded estimates are consistent with non-random attrition have little to no impact on our primary estimates.

Finally, another source of concern could revolve around the indices as outcomes themselves. For one, it might be a concern that our estimates are driven by chance and of false discovery. To address this, we construct false discovery rate (FDR)-sharpened *p-values* following the procedure in Benjamini et al. (2006) and in Anderson (2008). The adjustments for the false discovery rate show that all significant treatment effects remain significant at the 10 percent level . Second, for all indices, nearly all outcome questions have a similar direction as the index itself (Appendix Figure A.3). Furthermore, nearly all heterogeneous outcomes result in the same direction as the index itself suggesting that no one single group

drives results in a specific direction (Appendix Table A.4).

C Appendix Variable Definitions by Index

Variable Name	Question Text
<i>Outcome Index 1: Government Support</i>	
GovRep	Overall, how well do the current president and legislators represent your preferences as a whole?
RightTrack	All in all, do you think things in Ecuador are generally headed in the right direction, or do you feel things are off on the wrong track?
ApprovePres	In general, do you approve or disapprove of the job Guillermo Lasso is doing as president?
ApproveCongress	In general, do you approve or disapprove of the job that the National Assembly is doing?
GovDoRight	How much of the time do you think you can trust the government in Quito to do what is right?
GovPurpose	Think more broadly about the purpose of government in general. Where would you rate yourself on a scale of 0 to 100, where 0 means you think the government should do only those things necessary to provide the most basic government functions, and 100 means you think the government should take active steps in every area it can to try and improve the lives of its citizens?
LimitFraud	Do you agree or disagree with the following statement? “Currently, the federal government is very effective in limiting fraud, waste, and abuse in the programs it administers.”
<i>Outcome Index 2: Tax Perceptions</i>	
GovWaste	Do you think that people in the government waste a lot of the money we pay in taxes, waste some of it, or don’t waste very much of it?
Poverty	Do you think poverty is a serious problem in Ecuador?
TaxesFair	How fair do you think our present federal tax system is? Overall would you say that our tax system is...
AvoidTaxes	Do you agree or disagree with the following statement? “The avoidance of taxes is the only intellectual pursuit that still carries any reward” - John Keynes

Outcome Index 3: Affective Polarization

FeelingsInGroup	Think of those who voted for the same political candidate as you. Would you say your overall opinion of these people is unfavorable or favorable?
FeelingsOutGroup	Think of those who voted for a different political candidate as you. Would you say your overall opinion of these people is unfavorable or favorable?
MarryLeft	How do you think you would react if a member of your immediate family told you they were going to marry a liberal? Would you be generally happy about this, generally unhappy, or wouldn't it matter to you at all?
MarryRight	How do you think you would react if a member of your immediate family told you they were going to marry a conservative? Would you be generally happy about this, generally unhappy, or wouldn't it matter to you at all?
FriendGroup	Which of the following statements best describes you? a) Most of my close friends share my views on government and politics. b) Some of my close friends share my views, but many do not. c) I don't really know what most of my close friends think about government and politics.
RightThreat	Would you say the Republican Party's policies are so misguided that they threaten the nation's wellbeing, or wouldn't you go that far?
TrustPeople	Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?

D Appendix Experimental Survey

Figure D.1: Recruitment Email

Hola \${m://FirstName}!

Somos Roberto Mosquera y Trent McNamara, investigadores de la Universidad de las Americas (UDLA) y Abilene Christian University.

¿Estas interesado en participar en un proyecto de investigación y en la oportunidad de ganar gift cards de hasta \$500? Nuestro equipo de investigadores de la UDLA y ACU necesitan tu ayuda completando una encuesta corta sobre preferencias políticas. Si estás interesado, por favor da click en el enlace para comenzar.

Este enlace te dará más información sobre el estudio. Tu participación es voluntaria. Todas tus respuestas se almacenarán de forma confidencial y solo serán utilizadas para este estudio. De conformidad con la Ley Orgánica de Protección de Datos Personales, al finalizar el estudio, su información será anonimizada y destruiremos cualquier dato personal que permita identificarle

Muchas gracias por su ayuda!!

De click en este link para ir a la encuesta:

[\\${l://SurveyLink?d=Take the Survey}](#)

O copie y pegue la siguiente URL en su navegador de internet:

[\\${l://SurveyURL}](#)

Contamos con el apoyo de una institución financiera para la elaboración de este estudio. Su información email proviene de las bases de datos de mercadeo esta institución. Si no desea recibir correos en el futuro y desea retirar su información personal de esta base de click en este link:

[\\${l://OptOutLink?d=Click here to unsubscribe}](#)

Figure D.2: Survey Screen #1

Estudio sobre Preferencias Políticas y Formación de Creencias

Usted está invitado para participar en el siguiente estudio. Por favor lea esta información con cuidado y si tiene alguna pregunta puede contactar el equipo de investigación (la información de contacto se detalla abajo). Puede preguntar sobre cualquier duda que tenga de las actividades que realizará el estudio o sobre los potenciales riesgos y beneficios. Siéntase libre de discutir sobre su participación con cualquier otra persona, como un miembro de su familia.

Su participación en este estudio es voluntaria. Usted puede decidir no participar o salir del estudio en cualquier momento y por cualquier razón sin ninguna penalidad o pérdida de beneficios a los que tenga derecho.

Objetivo y descripción del estudio

Usted está invitado a participar en este estudio porque estamos tratando de aprender más sobre la preferencias políticas y comportamientos asociados. Este estudio usa una encuesta diseñada para investigar preferencias políticas y como las personas forman sus creencias en relación a la política. Esta encuesta le preguntará información demográfica, preferencias políticas, y creencias sobre el gobierno ecuatoriano.

Si decide participar, será redireccionado a la encuesta. Esta encuesta no toma más de 15 minutos en completar. Posiblemente le contactaremos en el futuro para una segunda encuesta que también tendrá una duración de 15 minutos y será compensada por separado.

Riesgos y beneficios

Esta encuesta recoge información sobre sus preferencias políticas, incluyendo si está afiliado a algún partido político y cómo votó en las últimas elecciones. Usted puede salir de la encuesta en cualquier momento. El principal riesgo asociado con este estudio es una brecha de confidencialidad, pero hemos tomado medidas para minimizar este riesgo. Estas medidas se explican en la sección Privacidad y confidencialidad a continuación.

Su participación en este estudio conlleva potenciales beneficios. Si usted decide participar y completa la encuesta, usted tendrá la posibilidad de ganar uno de los siguientes premios:

- Una tarjeta GiftCard Diners Club de un valor de 500 dólares (una disponible)
- Una tarjeta GiftCard Diners Club de un valor de 100 dólares (cinco disponibles)
- Una tarjeta GiftCard Diners Club de un valor de 50 dólares (veinte disponibles)

Para participar de este sorteo, solo tiene que completar la encuesta. Notificaremos a los ganadores hasta el 31 de agosto de 2021. Si usted se retira anticipadamente de la encuesta, no participará del sorteo. El equipo investigador no garantiza que usted recibirá ningún otro beneficio personal por participar en el estudio.

Además, si decide completar esta encuesta, tendrá la oportunidad de participar en la segunda ronda del estudio en enero de 2022, donde tendrá una segunda oportunidad de participar en un segundo sorteo por los mismos premios.

Privacidad y confidencialidad

Toda su información será manejada de forma confidencial de acuerdo a la ley. Es posible que parte de su información personal identificable sea compartida con personas fuera del equipo de investigación, como miembros de los comités de ética de la UDLA y de Abilene Christian Universty (ACU Institutional Review Board). Su email y otra información identificable se almacenará por separado de información de la encuesta y solo se utilizará para notificar los resultados del sorteo y el seguimiento en enero de 2022. Toda la información se almacenará en una computadora protegida con contraseñas y solo es accesible por el equipo de investigación. Su email y otra información identificable no se utilizará por fuera de este estudio y será destruida al finalizar el mismo.

Los resultados del estudio pueden ser publicados, pero nadie podrá identificarlo en esos resultados.

Como se mencionó antes, el principal riesgo de este estudio es una brecha de confidencialidad. Hemos tomado medidas de encriptación para proteger su información. No obstante, Qualtrics, el sistema donde esta alojada su encuesta, podría guardar información asociada con su sistema operativo y navegador. Usted puede revisar las políticas de privacidad de Qualtrics en este link <https://www.qualtrics.com/security-statement/>.

Recolección de información identificable

Esta información será destruida al finalizar el estudio. Una vez destruida la información identificable, sus respuestas anónimas podrán ser utilizadas para investigaciones futuras, incluyendo a otros investigadores, sin que vuelva a ser contactado.

Contacto

Si tiene preguntas sobre este estudio, puede contactar a los investigadores principales, Dr. Roberto Mosquera al correo roberto.mosquera@udla.edu.ec, o Dr. Trent McNamara al correo tgm2la@acu.edu. Si tiene preocupaciones sobre este estudio o cualquier duda general sobre sus derechos como participante, usted puede contactar a Diego Chauvin, director del Comité de Bioética de la UDLA (CEBE-UDLA) al teléfono 39881000 ext. 116 o al correo diego.chauvin@udla.edu.ec.

Información adicional

Esperamos aproximadamente 2.000 participantes en este estudio.

El equipo investigador puede terminar anticipadamente su participación en este estudio por algunas razones. Por ejemplo, podemos terminar su participación si usted deja de cumplir los requerimientos del estudio, si creemos que seguir participando no está en su mejor interés, si no sigue las instrucciones del estudio, si no presta atención a la encuesta, o si el estudio termina anticipadamente. En el caso que usted sea removido del estudio, usted será contactado por el equipo investigador con instrucciones adicionales.

Aceptación

Por favor imprima esta pantalla si quiere una copia de este formulario. Aceptar participar en este estudio no implica renunciar a ninguno de sus derechos.

Seleccione aquí si acepta participar en esta encuesta y que su información identificable sea utilizada exclusivamente para este estudio

Seleccione aquí si no desea participar en la encuesta o cierre esta ventana en su navegador



If a participant chooses not to participate, then the survey ends. If they do, they are revealed the rest of the following survey.

Figure D.3: Survey Screen #2

Muchas gracias por participar en este estudio. Primero cuéntenos un poco sobre usted.

¿Cuántos años tiene?



Figure D.4: Survey Screen #3

¿Cuál es su género?

Masculino

Femenino

Otro

Por favor señale el nivel de educación más alto que completó

Menos que secundaria o bachillerato

Secundaria o bachillerato

Tecnología o educación vocacional post-secundaria

Universidad (pregrado)

Maestría

Doctorado o PhD

¿Cuál es su estado civil?

Divorciado

Unión libre

Casado

Separado

Soltero

Viudo

De las siguientes opciones, usted se autoidentifica como

Negro o afroecuatoriano

Blanco

Mestizo

Indígena

Montubio

¿Cuántos hijos tiene? (Ingrese un número)

¿Cuál de las siguientes opciones describe mejor la zona donde vive?

Urbana

Suburbana

Rural



Figure D.5: Survey Screen #4

Piense sobre las diferentes fuentes de noticias e información que usa. Por favor indique en la siguiente escala donde estaría la mayoría de sus fuentes de noticias.

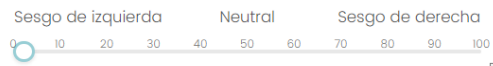


Figure D.6: Survey Screen #5

¿Cómo describiría su posición frente a temas sociales?



¿Cómo describiría su posición frente a temas económicos?



En general, qué tan bien representan sus preferencias el presidente y los asambleístas?



¿Por quién votó en la última elección presidencial de abril 2021?

- Guillermo Lasso
- Andrés Arauz
- Nulo
- Blanco
- No voté



Figure D.7: Survey Screen #6

Piense en las personas en la funciones Ejecutiva y Legislativa del gobierno responsables de la elaboración del Presupuesto General del Estado.

En su cabeza, ¿ quiénes son estas personas? Seleccione todas las que apliquen.

Los ministros de Estado

El presidente

Los asambleístas



Figure D.8: Survey Screen #7

La Constitución de 2008 establece que la elaboración del presupuesto es un proceso conjunto entre la función Ejecutiva y la función Legislativa donde el presidente propone un presupuesto y la Asamblea Nacional lo aprueba.



Figure D.9: Survey Screen #8

Juguemos un juego!

Piense en las personas en la funciones Ejecutiva y Legislativa del gobierno responsables de la elaboración del Presupuesto General del Estado. El gobierno recibe 100 dólares y les pide a estas personas distribuirlos entre dos sectores.

¿Cómo cree que estas personas distribuirían estos 100 dólares?

Programas educativos	<input type="text" value="0"/>
Pago de deuda pública	<input type="text" value="0"/>
Total	<input type="text" value="0"/>



Figure D.10: Survey Screen #9

Juguemos un juego!

Suponga que usted es el responsable de elaborar el Presupuesto General del Estado. El gobierno recibe 100 dólares y usted tiene que distribuirlos entre dos sectores.

¿Cómo quisiera usted distribuir estos 100 dólares?

Programas educativos	<input type="text" value="0"/>
Pago de deuda pública	<input type="text" value="0"/>
Total	<input type="text" value="0"/>



Figure D.11: Survey Screen #10

En resumen:

Usted quisiera asignar **\$0** a programas educativos pero cree que el actual gobierno distribuiría **\$0**.

Por lo tanto, usted piensa que el actual gobierno no debería cambiar su gasto en programas educativos.

Considerando esto, en lo que respecta **exclusivamente al gasto en programas educativos**:

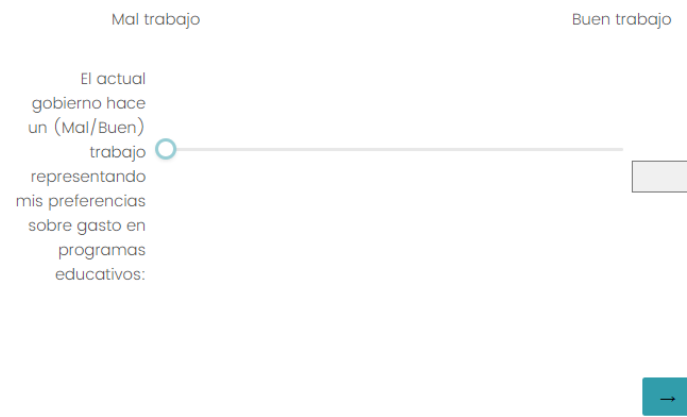


Figure D.12: Survey Screen #11

De acuerdo a cifras oficiales del Ministerio de Economía y Finanzas, **el actual gobierno está asignando 37 dólares a programas educativos.**

Mientras usted creía que el actual gobierno no debería cambiar su gasto, en la práctica debería gastar **\$37 menos** en programas educativos.

Considerando esto, en lo que respecta **exclusivamente al gasto en programas educativos:**

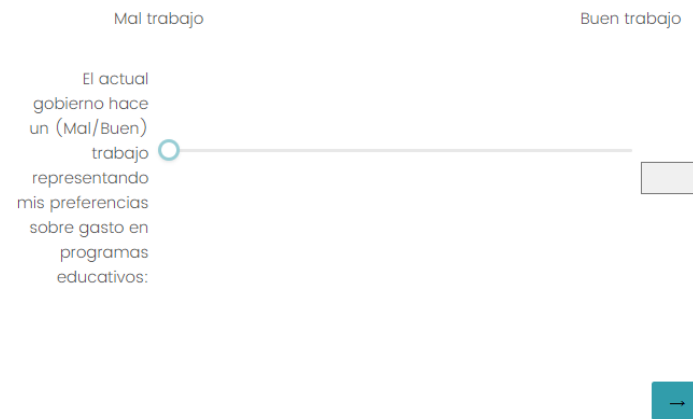


Figure D.13: Survey Screen #12

En general, ¿qué tan bien representan sus preferencias el presidente y los asambleístas?



En general, ¿diría usted que se puede confiar en la mayoría de las personas o que hay que ser muy cuidadoso en el trato con otras personas?



En general, ¿cree usted que la situación de Ecuador va en la dirección correcta, o cree que la situación está empeorando?



Figure D.14: Survey Screen #13

En general, usted aprueba o desaprueba la gestión que...



¿Puede usted confiar que el gobierno esta haciendo lo correcto?



¿Cree usted que el gobierno desperdicia mucho el dinero que pagamos en impuestos, desperdicia un poco de ese dinero, o no desperdicia casi nada?

- Desperdicia mucho del dinero que pagamos en impuestos
- Desperdicia un poco del dinero que pagamos en impuestos
- No desperdicia casi nada del dinero que pagamos en impuestos



Figure D.15: Survey Screen #14

Ahora, piense en el propósito que el Gobierno Nacional debería tener en general.

¿Dónde se sitúa usted en una escala de 0 a 100, donde 0 significa que usted cree que el gobierno **debería** tener un intervención mínima en el país, y 100 significa que usted cree que el gobierno **debería** tener un rol activo en cada área para mejorar las vidas de sus ciudadanos?



Fiense detenidamente en los candidatos de la primera vuelta de las elecciones presidenciales de 2021.

Queremos conocer su opinión sobre estos candidatos, pero también queremos saber si lee con atención estas preguntas. Para mostrar que está prestando atención, por favor ignore la pregunta y seleccione "Isidro Romero" y "Ximena Peña." Si, ignore la pregunta y selecciones estas dos opciones.

¿Cuáles de los siguientes candidatos cree usted que representan mejor sus preferencias como presidente?

- Andrés Arauz
- Guillermo Lasso
- Yaku Pérez
- Xavier Hervas
- Pedro José Freile
- Isidro Romero
- Lucio Gutiérrez
- Gerson Almeida
- Ximena Peña
- Guillermo Celi
- Juan Fernando Velasco
- César Montúfar
- Other candidates
- None of the above



Figure D.16: Survey Screen #15

¿Cree usted que la pobreza es un problema grave en Ecuador?



¿Está usted de acuerdo o en desacuerdo con la siguiente afirmación?

"Actualmente, el gobierno nacional no es efectivo para limitar el fraude, desperdicio de recursos y abuso en los programas que administra."



¿Qué tan justo cree usted que es el sistema tributario del país?
En general, diría usted que el sistema tributario del país es...



¿Está usted de acuerdo o en desacuerdo con la siguiente afirmación?

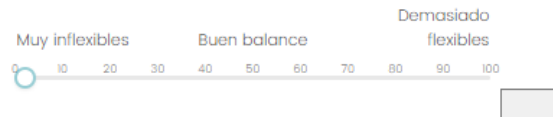
"Evadir el pago de impuestos es la única actividad intelectual que todavía tiene una recompensa" - John Keynes (traducido del inglés)



Figure D.17: Survey Screen #16

Piense sobre la relación entre los partidos de **derecha** en la Asamblea Nacional y el Presidente:

¿Cree usted que los partidos de **derecha** en la Asamblea Nacional son muy inflexibles en su relación con el Presidente, o son demasiado flexibles en dar razón al Presidente, o tienen un buen balance en su relación con el Presidente?



Piense sobre la relación entre los partidos de **izquierda** en la Asamblea Nacional y el Presidente:

¿Cree usted que los partidos de **izquierda** en la Asamblea Nacional son muy inflexibles en su relación con el Presidente, o son demasiado flexibles en dar razón al Presidente, o tienen un buen balance en su relación con el Presidente?

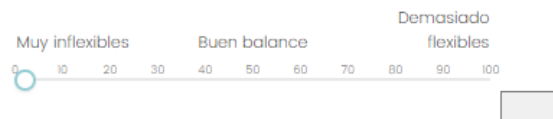


Figure D.18: Survey Screen #17

Piense sobre cómo el Presidente y los líderes de los partidos y movimientos de izquierda **deberían** tratarlos temas más importantes para el país. Imagine una escala de 0 a 100 donde 100 significa que los líderes de los partidos y movimientos de izquierda obtienen todo lo que quieren y el Presidente nada, y 0 significa que el Presidente obtiene todo lo que quiere y los líderes de los partidos y movimientos de izquierda nada. ¿Dónde cree que **deberían** estar?



¿Cuál de los siguientes enunciados esta más cerca de su forma de pensar, aunque ninguno sea 100% correcto? Me gustan dignatarios de elección popular que...

- Hacen compromisos con personas con quienes no están de acuerdo
- Mantienen firmemente sus posiciones



Figure D.19: Survey Screen #18

¿Está usted de acuerdo o en desacuerdo con la siguiente afirmación?

"Si tengo que recurrir a la violencia para proteger mis derechos, lo haré."


Desacuerdo De acuerdo



A horizontal slider scale with a teal circle at the 0 mark and a text input box at the 100 mark.

Por favor indique en la siguiente escala de donde preferiría obtener la mayoría de sus fuentes de noticias.

Sesgo de izquierda Neutral Sesgo de derecha



A horizontal slider scale with a teal circle at the 0 mark and a text input box at the 100 mark.



Figure D.20: Survey Screen #19

Piense en aquellas personas quienes votaron igual que usted en la segunda vuelta de las elecciones presidenciales.

En general, ¿Tiene usted una buena o mala opinión sobre estas personas?

Muy mala 0 10 20 30 40 Neutro 50 60 70 80 Muy buena 90 100



Piense en aquellas personas quienes votaron diferente que usted en la segunda vuelta de las elecciones presidenciales.

En general, ¿Tiene usted una buena o mala opinión sobre estas personas?

Muy mala 0 10 20 30 40 Neutro 50 60 70 80 Muy buena 90 100



¿Cómo cree que reaccionaría si un miembro de su familia inmediata le contara que se va a casar con una persona de izquierda? En general, ¿estaría feliz con esto, infeliz con esto, o no le importaría?

Infeliz 0 10 20 30 40 No me importaría 50 60 70 80 Feliz 90 100



¿Cómo cree que reaccionaría si un miembro de su familia inmediata le contara que se va a casar con una persona de derecha? En general, ¿estaría feliz con esto, infeliz con esto, o no le importaría?

Infeliz 0 10 20 30 40 No me importaría 50 60 70 80 Feliz 90 100



¿Cuál de los siguientes enunciados le describe a usted mejor?

- La mayoría de mis amigos cercanos comparten mis opiniones del gobierno y la política.
- Algunos de mis amigos cercanos comparten mis opiniones, pero algunos no lo hacen.
- En realidad no se los que mis amigos cercanos piensan del gobierno y la política.

¿Diría ustedes que las políticas de los partidos y movimientos políticos de de derecha están tan fuera de foco con la realidad que son una amenaza para el bienestar del país, o no iría tan lejos?

No
0

Si
100



Figure D.21: Survey Screen #20

¿Cuál cree que es el objetivo de este estudio?



Figure D.22: Survey Screen #21

Suponga que el gobierno le entrega un recibo que detalla como se gastó sus impuestos. ¿Estaría interesado en recibir esta información?

Sí

No



Figure D.23: Survey Screen #22

De acuerdo a cifras oficiales del Ministerio de Economía y Finanzas, de cada 100 dólares adicionales que recibe el gobierno, distribuye 63 dólares al pago de la deuda externa y 37 dólares a programas educativos.

¿Usted cree estas cifras?

Yes

No



Figure D.24: Survey Screen #23

¿Hay algo más que desea compartir con el equipo de investigación?



Figure D.25: Survey Screen #24

Muchas gracias por completar esta encuesta! Por favor ingrese la siguiente información para participar en el sorteo de las tarjetas de regalo. Le recordamos que esta información solo se utilizará para contactar a los ganadores, asignar los premios y comunicar los resultados del sorteo. Adicionalmente, en enero 2022 le contactaremos con una segunda encuesta acompañada de un segundo sorteo. Destruiremos esta información al terminar el estudio.

Nombres completos (Nombres y apellidos)

Número de cédula

Correo electrónico

Teléfono de contacto (ingrese con código de área, ejemplo 02xxxxxx o 09xxxxxx)



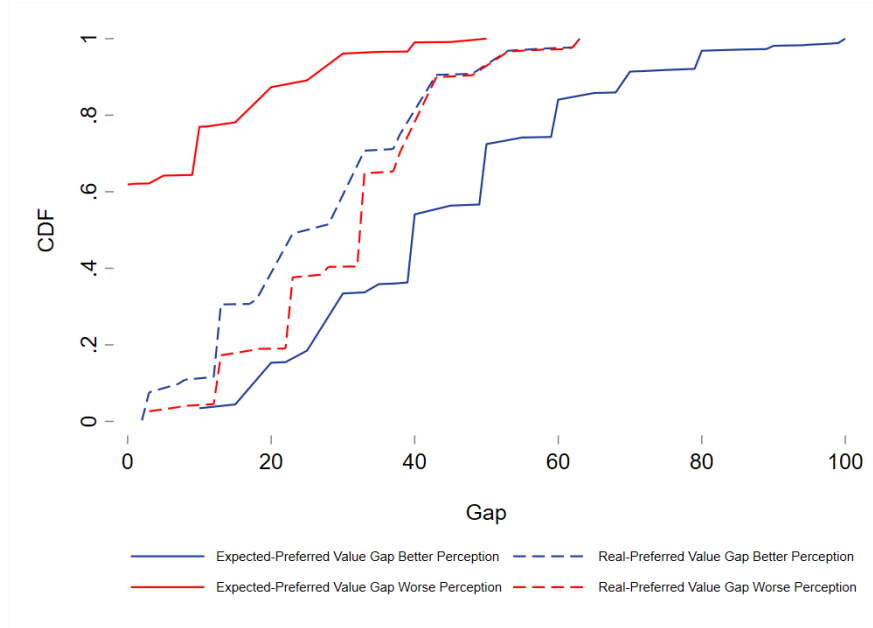
E Online Appendix - Replication of McNamara and Mosquera (2022)

In this section we replicate the main results found in McNamara and Mosquera (2022) using a different sample at a different point in time. In summary, we follow a similar experimental design but there are several differences worth highlighting. First, we elicit preferences for government debt payments and education programs whereas McNamara and Mosquera (2022) elicit preferences for welfare and military spending. While each pair of expenditures is intended to capture polarized issues, the relative allocations are different. In reality, for a given \$100 the government in Ecuador allocates \$63 to debt payments and \$37 to education. In the U.S., the government allocates \$56 to military and \$44 to welfare programs. Second, experimental samples differ in terms of country and the time period. Third, while there is some overlap between the outcome questions, we identify effects on different sets of indices. However, we try to reconstruct indices with our outcome questionnaire to approximate and compare with those used in McNamara and Mosquera (2022). Primary replication results are presented below.

We first begin by documenting the distribution of misperceptions using differences between an individual's preferences, expectations, and the real allocation. For both of the negatively and positively inflated belief groups, we plot the difference between $|E_i - P_i|$ and of $|R - P_i|$ in Figure E.1 below. Additional tests using Kolmogorov-Smirnov based statistics confirm statistical differences between the distributions above a 99% confidence threshold. For both groups, we document similar differences between $|E_i - P_i|$ as in McNamara and Mosquera (2022). This indicates that misperceptions are equally sized between the two, but the difference we find between $|R - P_i|$ indicates an additional result. Revealing R does mend the gaps significantly but should not result in complete convergence between the two groups, suggesting more systematic differences between the two groups in the Ecuador sample.

Following this, we investigate whether revealing the real allocation induces better or worsened perceptions for each respective group. This is initially done for perceptions about

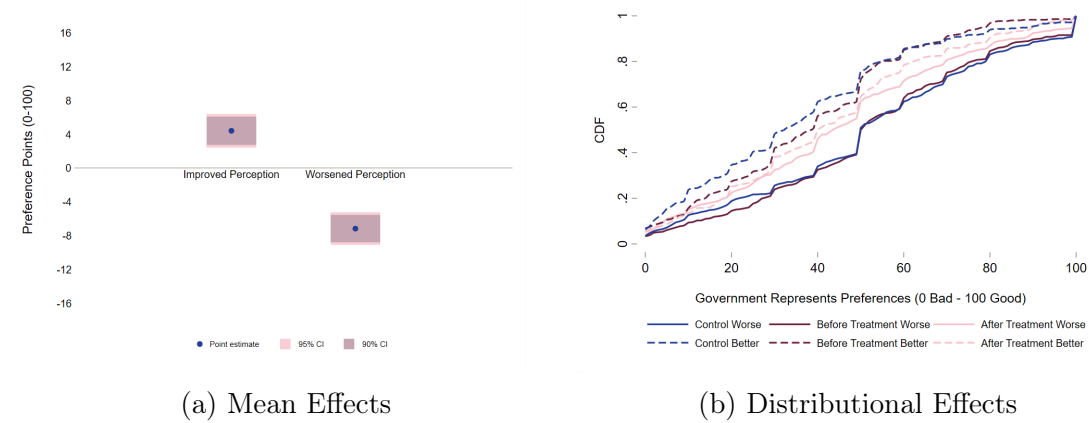
Figure E.1: Differences Between Allocation Preferences, Expectations, and Reality



Notes: This figure plots the CDFs of the difference (“Gap”) between an individual’s preferred allocation and their expected allocation, as well as the difference between an individual’s preferred allocation and the real allocation. This is displayed for both groups who are either treated to a better or worse perception towards the government.

spending allocations first to test for rationality and bayesian updating. That is, we ask participants if they feel like the government represents their spending preferences for government debt/education programs. Given the immediacy and veracity of information we provide, rational agents are predicted to update in the direction of the signal for this outcome. Results are presented in Figure E.2. Panel (a) documents the mean effects showing that improving perceptions increases whether an individual thinks the government represents their spending preferences by about 4.4 preference points ($p\text{-value} = 0.000$), and that worsening perceptions reduces this by almost 7.2 preference points ($p\text{-value} = 0.000$). Distributional effects are presented in panel (b). Tests of equality, first order stochastic dominance, and second order dominance confirm differences in the distributions between the respective control and treatment groups. Comparatively, these are smaller effects but consistent with the above observation of samples being different. We find similar distributional movements for all groups as well.

Figure E.2: The Impact of Information on Government Representation



Notes: Panel (a) of this figure presents the treatment-on-the-treated effects on information and whether an individual thinks the government represents their spending preferences. Both 95 percent and 90 percent confidence intervals are displayed. Panel (b) shows effects at the distribution level.

Given the direct correction of immediate beliefs and perceptions, we further test the impacts of correcting spending perceptions on a secondary set of outcomes related to broad behavior sets. We construct indices similar to the ones used in McNamara and Mosquera (2022) using the variables available from our questionnaire. While we are unable to construct them identically, we are still able to approximate their construction. We then test the treatment on the treated effects on the indices capturing beliefs that affect the political process, including government support, views about government efficiency, and the willingness to trust and compromise. Results are presented in Figure E.3

Across the board, improving beliefs is associated with a 0.22 s.d. increase ($p\text{-value} = 0.081$) in government and political support, a 0.43 s.d. increase ($p\text{-value} = 0.032$) in the willingness to trust and compromise, and a 0.21 s.d. increase ($p\text{-value} = 0.159$) in the belief that the government is efficient. These results are robust to the inclusion of individual-level controls, data quality concerns, and concerns about participant attention. We do not find any movement resulting from worsening beliefs. While asymmetric responses have been documented in the literature, our results show positive movements when improving beliefs whereas previous work shows it for worsening beliefs. This difference is potentially a result of using a different sample with different preference orderings of the specific spending categories.

Figure E.3: Perceptions and Behaviors



Notes: This figure presents the treatment-on-the-treated effects of perception changes on various indexes on beliefs that affect the political process, including government support, views about government efficiency, and the willingness to trust and compromise. Both 95 percent and 90 percent confidence intervals are displayed.

For example, over a very large set of various spending categories, groups might hold positive values for each but also have different rankings of importance between them. Since we only capture preferences for two categories, we are unable to compare an individual's ranking across the full sets. Hence, one possible explanation for the difference in results could stem from treatment correcting beliefs for policies that differ in importance and ranking for the individual.