More public goods, larger government, and more redistribution*

Daiki Kishishita†
Atsushi Yamagishi‡
Tomoko Matsumoto§

November 21, 2022

This study uncovers a novel effect of public goods on inequality through public opinions. We hypothesize that people are more likely to support a tax increase after realizing the benefit from public goods, helping to reduce inequality by expanding government size. We conducted an online survey wherein the treatment group was informed about the universal benefits of public goods. We found that although the treatment substantially enhances support for a larger government, its impact on desired tax and spending progressivity is limited. Thus, increased perceived benefits might allow government to politically achieve redistribution through size expansion without reducing policy progressivity.

Keywords: Preferences for redistribution, Public goods, Government size, Benefit-based taxation, Survey experiment

*Authors' names are listed in random order. We would like to thank Diogo Ferrari, Chishio Furukawa, Jun Goto, Masaki Hata, Masayoshi Hayashi, Yasushi Iwamoto, Kohei Kawaguchi, Toshifumi Kuroda, Hirofumi Miwa, Tsuyoshi Shinozaki, Hirofumi Takesue, Junichi Yamasaki, seminar participants at Happy Hour Seminar, Tokyo Keizai University, Kobe University, Musashi University, the University of Tokyo, and Doshisha University, and participants of the 2022 Winter Meeting of the Japanese Society for Quantitative Political Science, the 2022 Annual Meeting of the Midwest Political Science Association, and the 2022 Annual Meeting of the Japanese Association of Electoral Studies for their helpful comments. This study was financially supported by Tokyo Center for Economic Research, the Murata Science Foundation, and JSPS KAKENHI grant number 20K22131 and 22K13339. This research was approved by the Tokyo University of Science Institutional Review Board (Protocol number 21003) and preregistered at AEA RCT Registry (AEARCTR-0007684).

†School of Management, Tokyo University of Science. 1-11-2, Fujimi, Chiyoda-ku, Tokyo, Japan. 102-0071. E-mail: daiki.kishishita@gmail.com

‡Department of Economics, Princeton University. Julis Romo Rabinowitz Building, Princeton University, Princeton, NJ, United States. 08544. E-mail: ayamagishi@princeton.edu

§Institute of Arts and Sciences, Tokyo University of Science. 1-3, Kagurazaka, Shinjuku-ku, Tokyo, Japan. 162-8601. E-mail: tomoko.matsumoto@rs.tus.ac.jp

1. Introduction

The distributional effect of public goods provision has received attention for a long time, both theoretically and empirically. The standard analysis centers around the degree of benefits that each income group receives from the provided public goods and the amount of taxes that each income group pays to finance them (e.g., Atkinson and Stiglitz 1980; Suàrez Serrato and Wingender 2014; Boardman, Greenberg, Vining, and Weimer 2017; Brülhart, Danton, Parchet, and Schläpfer 2022). In contrast to such a traditional approach, this study aims to explore an overlooked effect of public goods on inequality, which is caused by a change in the public opinions about taxation and public expenditure.

In democratic societies, public opinion as an aggregation of individual policy preferences is a key determinant of governments' fiscal activities (Meltzer and Richard, 1981), which has motivated the literature to identify determinants of public opinion (e.g., Kuziemko, Norton, Saez, and Stantcheva, 2015; Alesina, Stantcheva, and Teso, 2018). While this literature has focused on factors such as inequality perceptions, several studies have highlighted that the governmental fiscal activities such as welfare spending, in turn, may influence preferences for the fiscal activities (Kuklinski, Quirk, Jerit, Schwieder, and Rich 2000; Barnes, Feller, Haselswerdt, and Porter 2018). If so, realizing the benefits of public goods provision is also expected to change citizens' preferences for taxation and public expenditure, but such a possibility has been overlooked. In this paper, marrying this idea with the growing literature of online survey experiments in political economy, we analyze how realizing the benefits of public goods has distributive effect through changing public opinions.

We hypothesize that realizing the governmental role of public goods provision influences public opinion regarding taxation and public expenditures in the following ways. First, it increases the support for a larger government (i.e., higher tax rates) because people who become aware of the universal benefit of government activities become willing to pay more for it. A larger government contributes to reducing inequality because it can implement redistributive policies on a bigger scale. Hence, the first effect implies that public goods provision could reduce inequality through a change in public opinion on government size. Second, since everyone

equally enjoys public goods provision, this might lead to the consideration that everyone should equally pay tax (Weinzierl, 2017), thus, implying a decrease in support for tax progressivity. Third, similar to the second effect, an increase in the demand for public goods provision might crowd out the support for welfare policies targeted at the poor. The second and third ways are negative effects on reducing inequality. Consequently, the total distributional effect through a change in public opinion gets determined by which effect dominates the other.

To uncover the effect of realizing the governmental role of public goods provision, we conducted an online survey experiment in the US with around 3,000 participants. The US faces severe inequality but its government size is relatively small compared to other Organization for Economic Co-operation and Development (OECD) countries. This situation makes the US an interesting and relevant setting for exploring our hypothesis on the expansion of government size.

Our experimental intervention is motivated by the growing evidence that citizens do not know in detail what the government does (Kuklinski et al. 2000; Barnes et al. 2018; Giaccobasso, Nathan, Perez-Truglia, and Zentner 2022). In the survey, respondents were randomly assigned to the treatment that informs about the governmental role in providing public goods. The treatment information comprised passages reminding respondents of government activities to maintain transportation infrastructure and public sanitation, both of which benefit all and not just targeted at the poor. The control group did not receive any such information. Then, respondents were asked to report their preferences for government size, and tax and spending progressivity. The intervention successfully increased perceived spending toward public goods provision.

We estimated the treatment effect on these political preferences to test our hypotheses and found the following results. First, the treatment substantially increased the support for a larger government by 10 percentage points. The strong increase in the support for the tax increase is notable given the numerous evidence that increasing taxes is unpopular among voters (e.g., Ardanaz, Hallerberg, and Scartascini, 2020; Hübscher, Sattler, and Wagner, 2021). Moreover, this result also contrasts with a recent finding that information about severe income inequality does not necessarily change preferences for a larger government (e.g., Kuziemko et al., 2015). Second, although spending progressivity might be somewhat moderated toward equal spending,

no evidence that indicated reduction in tax progressivity was found. This implies that policies can be almost as progressive as before. These results indicate that higher spending on public goods may indeed induce more redistribution via a larger government.

Finally, we discuss the practical relevance of our new connection between public goods and redistribution. First, we found that informing people of the governmental role of public goods unanimously increased the support for a larger government independently of respondents' socioeconomic backgrounds and political ideologies, contrary to the polarized effect found in the literature (e.g., Alesina, Stantcheva, and Teso, 2018). This implies that our argument could be practically powerful given that obtaining unanimous support facilitates the political success of a policy.

Second, we examined whether our treatment effects are mediated through the increase in trust in government (Kuziemko et al. 2015). We found that trust in government does not mediate our treatment effects, despite that the left-wing people increased their trust in response to our treatment. This result implies that our finding is likely to be robust to the various social configuration of trust in government.

Third, we conducted a supplementary experiment that informs people of the effectiveness of welfare programs and found that our supplementary interventions are also effective in increasing support for redistributive policies. However, more importantly, our main intervention of informing people about the benefit of public goods is likely to be at least as effective in inducing more support for redistribution as in informing about the effectiveness of welfare programs. Therefore, although the effect of public goods on preferences for taxation and redistribution might be indirect and auxiliary, it is comparable to, or perhaps stronger than, the impact of more direct approaches.

Overall, public goods and redistribution have a close connection through political processes via public opinion: providing more public goods would politically allow the government to expand and implement more redistributive policies. This new channel makes public goods provision more redistributive compared to the standard distributional analysis of public goods. For example, suppose that the government allocates a given sum to public goods and programs to help the poor. Higher provision of public goods crowds out public programs targeted at the poor.

In standard analysis, this would widen inequality if the rich and the poor value public goods equally, while inequality might shrink if the increased public goods are particularly helpful for the poor. Our results suggest that the assumption of a fixed budget in this example should be relaxed: public goods provision would promote redistribution by allowing the government to expand and conduct redistributive policies on a larger scale.

Related literature Recently, various studies have adopted an online survey experiment to examine the effect of providing information on policy preferences regarding redistribution (e.g., Kuziemko et al. 2015; Alesina, Stantcheva, and Teso 2018; Hoy and Mager 2021; Stantcheva 2021).[1] By using such an online survey experiment, our paper contributes to several strands of literature of redistribution and taxation.

First, some studies have informed people of government spending activities and examined their consequences on policy preferences. In particular, Kuklinski et al. (2000) conducted a survey experiment in the US, where information about the share of welfare spending was randomly assigned. They found that people were likely to be unfamiliar with the accurate share of welfare spending, and their treatment increased their support for welfare spending. In addition, Barnes et al. (2018) conducted a large-scale field experiment in the UK, which analyzed the effect of taxpayer receipts on policy preferences and found little effect. A recent independent study by Giaccobasso et al. (2022) also experimentally provided information on public spending and showed that it increased tax compliance when people realized its benefits. Our novelty is in investigating the new connection between the provision of public goods and public opinions on taxation and public expenditures by providing information on the benefits of public goods.

Second, we contribute to understanding political determinants of government size. The literature has focused on the effect of inequality, but the spending side of government activities has not been emphasized (Meltzer and Richard 1981; Iversen and Goplerud 2018; Bierbrauer, Boyer, and Peichl 2021). In contrast to these studies, we point to the importance of analyzing the spending side of the government by showing that government size might remain small when people do not correctly recognize the universal benefits from public goods provision.

[1] See Haaland, Roth, and Wohlfart (2020) for recent developments in online survey experiments in economics.

Finally, our study is partly motivated by the literature emphasizing the role of reciprocity in contrast to the standard optimal taxation literature that emphasizes utilitarianism. For example, in the literature of tax compliance, several studies have argued that people think tax payments are in exchange for services provided by the state (see Luttmer and Singhal (2014) for a literature review). A similar idea has been discussed in benefit-based taxation, which states that tax liabilities should be determined by how much an individual benefits from state activities (Scherf and Weinzierl 2020). In particular, Weinzierl (2017) provided a survey result proving Americans subscribe to such benefit tax views more than utilitarian views. Giaccobasso et al. (2022) recently showed in a field experiment that informing about the benefit of public spending increases tax compliance, which is consistent with taxpayers holding benefit tax views. Our main results are consistent with such reciprocity and the relation to benefit-based tax views is discussed in detail in Section 6.6. Unlike these studies, however, we reveal the new effect of public goods on public opinion regarding taxation and public expenditures.

The remaining paper is organized as follows. Section 2 formally demonstrates how having a larger government can reduce inequality. Section 3 presents our hypotheses that we test experimentally, Section 4 describes our experiment and data, Section 5 presents our main results, Section 6 contains additional discussions, and Section 7 concludes.

2. Distributional effects of taxation and public spending

To understand the implications of a change in public opinion on inequality, we need to determine how each policy instrument influences inequality. Using a very simple model, we highlight that redistribution, defined as shrinking the utility gap between the rich and the poor, can be conducted either through adopting progressive policies or by expanding government size.

Suppose that in this economy, there is a continuum of agents with measure one. Half of the agents are the rich, and the rest are the poor. We denote the rich by H and the poor by L.

Individuals belonging to class $i \in \{H, L\}$ have a utility function given by $U(c_i, g_i, g_{pub}) := U(w_i - t_i, g_i, g_{pub})$, where c_i is i's private consumption, w_i is i's exogenous endowment ($w_H >$

w_L), and t_i is i's net tax payment. g_i and g_{pub} represent the amount of public spending.[2] In particular, g_i is the public spending targeted at class i, whereas g_{pub} is the amount of spending for public goods not targeted to a specific class. Because targeted spending is usually toward the poor, we assume for simplicity that $g_H = 0$. Thus, the government spends tax money either on goods that exclusively benefit the poor or public goods that benefit everyone in society.

We impose several standard assumptions on U to simplify our argument. First, it is differentiable and $U_1 > 0$, $U_2 > 0$, and $U_3 > 0$, meaning that the marginal utilities from each argument are strictly positive. We also assume that $U_{kl} = 0$ for any $k \neq l$; that is, U is additively separable. Finally, we assume that $\lim_{g_i \to 0} U_2 < \infty$ holds.[3]

The government administers taxation and spending policies under the budget constraint $T = G$, where $T := t_H + t_L$ is the total tax revenue and $G := g_L + g_{pub}$ is the total spending. To disentangle the roles of policy progressivity and government size in redistribution, we define *tax progressivity* τ and *spending progressivity* θ such that for any $G > 0$,

$$\tau := \frac{t_H}{T}, \quad \theta := \frac{g_L}{G}.$$

In other words, τ is the fraction of tax revenue levied on the rich and θ is the fraction of the public spending targeted at the poor. Larger values of τ and θ imply more policy progressivity, keeping the government size, G, fixed. Particularly, $\tau = \frac{1}{2}$ represents the situation where tax payment is independent of income, whereas $\theta = 0$ represents the situation where public spending is not targeted at the poor and every spending is used for public goods provision.

We consider a small policy change to the current government size and progressivity (G, τ, θ), and show that redistribution is possible either through increasing policy progressivity or through expanding government size. Let U^H (resp. U^L) be the utility of the rich (resp. the poor).

Proposition 1. *Assume that inequality is measured by $U^H - U^L$. Then, the following results hold:*

[2] g_L (public spending targeted at the poor) may take a form of income transfers, where g_L increases the poor's private consumption. In this case, the utility is given by $U(w_i - t_i + g_i, g_{pub})$. Our functional form admits this as a special case.

[3] Relaxing this assumption does not change our conclusions, except that we additionally need to impose some regular behavior of the model.

(i) Increasing τ and θ reduces inequality.

(ii) Increasing G also reduces inequality provided that τ is sufficiently large and $\theta > 0$.

(iii) Assume further that the quasi-linear utility $U(c_i, g_i, g_{pub}) = (w_i - t_i) + V_1(g_i) + V_2(g_{pub})$. Then, increasing G reduces inequality under any $\theta \geq 0$ and $\tau \geq \frac{1}{2}$, where at least one of the two inequalities holds strictly (i.e., under any progressive policy).

Proof. See Appendix. □

Proposition 1 shows that redistribution can be done by two measures.[4] More directly, one measure is to adopt a more progressive policy by taxing the rich more heavily or spending more on the poor, which can be seen in (i).

Although this is an important way to reduce inequality, Proposition 1 (ii) and (iii) show that another important measure is to expand government size while keeping policy progressivity constant. Intuitively, expanding government size implies scaling up existing progressive policies, which further helps the poor. Thus, expanding the government is an important way to mitigate inequality.

Note that Proposition 1 (ii) requires that the existing taxation be sufficiently progressive. Increasing government size decreases the amount of private consumption. When taxation is not so progressive, this negative effect due to consumption reduction might severely harm the poor.[5] Therefore, we need sufficiently progressive taxation. However, it should be emphasized that this condition is not restrictive. Proposition 1 (iii) illustrates this point by showing that under a quasi-linear utility function, even slightly progressive policies would be sufficient for government expansion to reduce inequality. While the degree of progressivity might vary, almost every country provides more net benefits to the poor than to the rich and taxes the rich more than it does the poor.[6] According to Proposition 1 (iii), this current situation is sufficient for government expansion to reduce inequality.

[4] In the proposition, inequality is measured based on the utility. Another way is to base it on after-tax income, but the same properties hold.

[5] This is because the marginal utility of consumption is higher for the poor.

[6] Indeed, the Gini coefficient before tax and transfers are larger than the Gini coefficient after tax and transfers in all countries in this OECD dataset (`https://ourworldindata.org/grapher/inequality-of-incomes-before-and-after-taxes-and-transfers-scatter`, last accessed on August 6, 2021).

3. Hypotheses

This study conducts a survey experiment, where respondents are randomly informed of the governmental role in providing public goods. Through this experiment, we aim to understand the distributional effect of public goods provision through a change in public opinion. Since redistribution can be conducted either through expanding government size or through adopting progressive policies as discussed in Section 2, we need to consider public opinion regarding both of these aspects.

As a first stage, informing people of the governmental role in providing public goods should increase the perceived benefit of public goods. To see this effect in detail, let us rewrite citizen i's utility in the previous section as $U(w_i - t_i, g_i, \alpha\beta g_{pub})$. The amount of spending for public goods itself is not equal to the amount of public goods consumed by the citizen. First, the actual amount of the public good depends on the efficiency of the government. To capture this, suppose that a unit amount of spending is converted to $\alpha(> 0)$ amount of public goods provided by the government. Second, even if the provided amount of goods is the same level, a citizen's utility depends on how amount of them are consumed by the citizen. If they are useless for the citizen, she or he would not consume them at all. To capture this, suppose that a citizen consumes $\beta \in [0, 1]$ fraction of goods provided by the government. Under these assumptions, the consumed amount of public goods is given by $\alpha\beta g_{pub}$.

Informing people that the government plays a key role in providing public goods that benefit every citizen changes the perceived values of α, β, and g_{pub}. First, the treatment is expected to increase one's perceived amount of spending for public goods provision, which corresponds to an increase in g_{pub}. In addition, the perceived ability of the government in providing public goods, which corresponds to α, may increase. Finally, people may realize the importance of public goods in maintaining their daily lives, which increases the perceived value of β. In either case, the perceived benefit of public goods, $\alpha\beta g_{pub}$ increases. Because our purpose is to investigate the effect of the increased perceived benefit of public goods without distinguishing the underlying mechanism behind its increase, our experimental treatment aims to increase all three components (α, β, g_{pub}) so that the increase in $\alpha\beta g_{pub}$ is ensured.

In response to a increase in the perceived benefits of public goods provision, we expect that reciprocity induces a higher willingness to pay taxes. For example, in the context of tax compliance, Luttmer and Singhal (2014) argue that "individuals may view taxes as part of a social contract: tax payments are made in exchange for services provided by the state" (p. 157).[7] A similar idea also lies in the notion of benefit-based taxation. Simply put, the benefit-based tax view states that tax liabilities should be determined by how much an individual benefits from the activities of the state (Scherf and Weinzierl 2020). As recently documented, Americans' policy preferences are based more on benefit tax views than on utilitarian views (Weinzierl 2017, 2018). Therefore, an increase in one's perceived value of public goods $\alpha\beta g_{pub}$ is expected to enhance the support for higher taxes through reciprocity.[8]

Hypothesis 1. *Realizing the governmental role of providing public goods increases the support for a larger government (i.e., increasing G and T).*

Our treatment may also influence one's preference for tax progressivity. Through reciprocity, people would agree to an increase in their own tax payment in response to larger benefits. However, this may not be the end of the story. People may extend this consideration to their view on what others should pay; that is, people might also expect others to exhibit reciprocity in paying taxes. This essentially corresponds to the benefit-based tax view: the tax system should be designed based on who benefits from government activities. Hence, when each citizen equally benefits from government activities, people with this view deem that everyone should pay an equal amount of tax (Scheve and Stasavage, 2022). We expect this to happen in our treatment because it deals with public goods that are beneficial for everyone, such as transportation infrastructure and public sanitation. Hence, we hypothesize that our treatment lowers tax progressivity.

Hypothesis 2. *Realizing governmental role of providing public goods decreases support for tax*

[7] See Alm, McClelland, and Schulze (1992) and Alm, Jackson, and McKee (1993) for early contributions on the role of reciprocity in tax compliance. See also Giaccobasso et al. (2022) for a recent contribution based on field experiments.

[8] In addition to this mechanism, the higher the marginal value of public goods, the larger the demand for public goods provision. Reflecting this larger demand, people would increase their support for higher taxes to enjoy more public goods. Put differently, people would demand more public goods when they perceive higher marginal utility from public goods $\partial U/\partial g_{pub}$.

progressivity (i.e., decreasing τ).

Finally, the higher values of α and β increase the support for spending more on such goods. It would reduce spending progressivity since such public goods are not targeted at the poor. Thus, the treatment may reduce support for spending progressivity.

Hypothesis 3. *Realizing the governmental role in providing public goods decreases support for spending progressivity (i.e., decreasing θ).*

Combining Hypotheses 1–3 with Proposition 1, whether our treatment enhances redistribution through a change in public opinion is determined by a race between government expansion effect (Hypothesis 1) and reduced policy progressivity (Hypotheses 2 and 3).

Importantly, the benefits from public goods are not limited to a particular group. Hence, we do not expect that the treatment works only among a particular group of respondents. This is essential for the political feasibility of redistribution. If our treatment homogeneously makes people supportive of redistribution, then it might suggest an easy pathway for achieving a political agreement for redistribution. For later convenience, we summarize this as an additional hypothesis:

Hypothesis 4. *The direction of the treatment effects in Hypotheses 1–3 is independent of socioeconomic status and political ideology.*

4. Experimental design

We implemented our online survey experiment from July 10 to 11, 2021. The survey had the following structure. At the beginning of the survey, respondents were asked to answer (i) an attention check question and (ii) questions on demographics and political attitudes. Then, we assigned them randomly to (iii) the treatment. Afterwards, they were asked to answer (iv) questions on their views on government size and policy progressivity. Respondents were mandated to answer all questions. The questionnaire is available in the Online Appendix.

The experiment was conducted using Qualtrics survey software. This research was approved by the Tokyo University of Science Institutional Review Board (Protocol number 21003) and

preregistered at AEA RCT Registry (AEARCTR-0007684).

4.1. Data collection

We posted the survey openly on Amazon Mechanical Turk (MTurk) with a description stating that the survey paid $1.10 for approximately 6 minutes of work.

To ensure the quality of the survey respondents, we took several measures.[9] First, we had Amazon show the survey only to workers who had US addresses to exclude foreign workers. Second, to exclude robots, only workers with a past completion rate of greater than 95 percent and past completion task number of more than 100 were allowed to take the survey. Third, to exclude any unexpected cheating, respondents could not receive payment unless they used a password visible only at completion. Fourth, we asked an attention check question at the beginning of the survey.[10] Only respondents who correctly answered this question were allowed to continue the survey; 92.56% of the respondents correctly answered this question.

Many studies in psychology and political science use MTurk to implement large-scale online survey experiments. Recent studies in economics have also used this platform (e.g., Kuziemko et al., 2015). While MTurk participants are not nationally representative samples, they are demographically diverse (e.g., Buhrmester, Kwang, and Gosling, 2011).[11] Existing studies indicate that results obtained using MTurk are similar to those using representative samples (e.g., Mullinix, Leeper, Druckman, and Freese, 2015; Snowberg and Yariv, 2021).

4.2. The treatment

We assigned respondents randomly to the treatment that aimed to make respondents consider that the US government plays an important role in providing public goods and services that benefit all citizens. The control group did not read any passage.[12]

[9] These are standard methods to ensure the quality of surveys that use MTurk (e.g., Kuziemko et al., 2015).

[10] See the first question of the questionnaire in the Online Appendix D.

[11] Moss, Rosenzweig, Robinson, and Litman (2020) report that the COVID-19 pandemic did not cause any change in the demographics of the participants on this platform.

[12] A concern was that those assigned to the treatment group might drop out of the survey because of the treatment being time-consuming. Although this is qualitatively true of our data, the attrition rate after treatment assignment was quite small in both groups (0.6% for the control group and 2.65% for the treatment group). Reassuringly, the balance test in the Online Appendix indicates the balancing of the two groups.

In particular, the respondents assigned to the treatment were asked to read two short passages on the role of the US government in providing public goods. To make sure that each respondent carefully read these passages, each passage was followed by two simple comprehensive questions.[13] The first passage is about the governmental role in improving the transportation system, whereas the second is about its role in maintaining public health.[14] The snapshots of our treatment are shown in Figure 1.

Each passage includes three types of information: the first is about the amount of government spending for public goods provision, the second is that this spending is not wasteful and the government did its job, and the third is about how beneficial the provided public goods is for the daily life. Each of them corresponds to g_{pub}, α, and β in Section 3 respectively. Providing only one of them might be insufficient to increase the perceived benefit of public goods provision. For example, suppose that respondents think that the government wastes their budget so that the value of α is quite low. Since the benefit of public goods provision is given by $\alpha\beta g_{pub}$, giving the first and third types of information does not increase $\alpha\beta g_{pub}$ much. To avoid such a failure, we include all three types of information.

In the treatment, we consider goods or services that benefit every citizen rather than targeted at the poor. All respondents are reasonably expected to benefit from the transportation system and public sanitation in daily life and it is easy to understand the nature of such goods that benefit everyone in the society.[15] In contrast, existing studies have analyzed the impact of providing information on taxes and welfare policies, which affect only a fraction of society (e.g., Kuklinski et al. 2000; Kuziemko et al. 2015). Since we are interested in being informed about the government activities that benefit everyone in redistribution, our treatment sidesteps

[13] In our sample, about 81.3% of respondents in the treatment group perfectly answered all the four comprehension questions. We did not drop the respondents who incorrectly answered these questions, because these questions were asked only to the treatment group and it would have affected the balancing of the two groups. Notwithstanding, our results do not change if we drop respondents that did not perfectly answer the comprehension questions.

[14] To cover public goods provided both at the national and the subnational level, we make the first passage about a public good provided by the federal level and the second passage about a public good provided at the local level.

[15] Our choice of public goods ensures the universality of benefits, rather than that of offers. For example, while public housing might be offered to everyone, the poor are more likely to take it up or benefit from it because the rich have alternative market options, but the transportation system and public health are enjoyed by everyone and the benefit is universal.

mentioning policies targeted at particular sets of people. In Section 6.4, we compare our result from the public goods experiment with the supplementary experiment that informs about the benefit of welfare programs.

4.3. Outcomes

After the treatment, the following questions were asked.

Manipulation check The purpose of the treatment is to make respondents realize the governmental role in providing public goods that benefit every citizen. To ensure that the treatment works as intended, we asked two questions to respondents. The first is

> How much of your taxes do you think are used for public goods and services that benefit all of you?

from 0 % to 100 %. If our treatment works as intended, the respondents who are assigned to the treatment should increase this number. For the treatment group, we asked the same question both before and after the treatment. The answer to this question might be considered as capturing the perceived spending level of public goods (g_{pub}).

The second question for the manipulation check is

> Regardless of the income, everyone in the US more or less benefits from public spending.
>
> - Agree
> - Disagree

If the treatment makes respondents more likely to choose "agree," it implies that our treatment is working as intended. Compared to the first question, the second focuses more on perceived utility gain from public goods and is more explicit about the absence of income heterogeneity in their benefits. Observing more "agree" in the treatment group thus ensures that people indeed realize that these benefits are more equally distributed, which is a prerequisite for predicting less support for progressive taxes based on Hypotheses 2 and 3.

Passage 1: Our Transportation System is Supported by the Government

The US government has played an essential role in improving our transportation systems. One of the most important infrastructure, although you might not be aware of in your everyday life, is the roads. The US has more than four million miles of public roads. Construction and maintenance of public roads are impossible without the government's large investment in the transportation infrastructure. In 2017, for example, the US government has spent 177 billion dollars just for highways.

Of course, roads are not the only infrastructure the US government takes care of. Americans annually make nearly 10 billion trips on public transportation such as buses and trains. The public investment is essential in maintaining our public transportation system. Our airports and other aviation infrastructure are also supported by the public spending. It enriches our life not only by allowing us to make trips but also, for example, by getting a delivery service when purchasing at an online market. By spending our tax money to improve the transportation system, the government has contributed to making our life better.

Comprehensive Questions:

Fill in the blank: The US government spent about ( ) billion dollars for highways in 2017.

Yes or No: Even a person who does not take a plane may benefit from the US air transportation system supported by the government.

- ○ Yes
- ○ No

Passage 2: The Government has Contributed to Maintaining Our Healthy Life

Imagine that your community suspends the trash disposal service from today. You would have to take your garbage with you and throw it away in a distant place, or otherwise your community would be contaminated.
Imagine also the sewer system at your home has stopped working. You would get into trouble in dealing with dirty water generated in your restroom and kitchen.

The trash disposal and the sewer system are essential in our life and the government has played a fundamental role in maintaining them. This is actually a quite expensive task. Americans generate nearly 300 million tons of solid waste every year and land-filling just one ton of it costs more than 50 dollars. Over the course of 20 years, the US government has spent more than 250 billion dollars for maintaining and improving the sewage system. Whether you may notice or not, the US government has actually spent a lot of your tax money for achieving our healthy life.

Comprehensive Questions:

Yes or No: US garbage collection system we use every day is supported by a large spending by the government.

- ○ Yes
- ○ No

Fill in the blank: Over the 20 years, the US government has spent over ( ) billion dollars for the sewage system.

Figure 1: Treatment

Preferences for government size Hypothesis 1 concerns how the treatment influences each respondent's preference for expansion of government. To test this hypothesis, we asked the following question:

> Imagine that the government says it needs to increase everyone's tax bill by 1%. Do you agree with this tax increase?
>
> - Agree
> - Disagree

Here, "agree" means that the respondent agrees to expand government size at the expense of a universal tax increase. Three points are noteworthy. First, agreeing with the statement clearly implies accepting own tax payment increase by 1% because of the phrase, "everyone's tax bill." Second, since status quo tax payment is progressive, an agreement implies agreement to a tax increase without reducing tax progressivity. Third, we have not specified how the extra money is used, implying that government would spend on not only public goods but other activities such as redistributive spending as well. In investigating preferences for spending progressivity, we later ask how respondents think the extra money *should be* used.

Preferences for tax progressivity Hypothesis 2 is about preferences for tax progressivity. We use the following two questions to measure each respondent's preference for tax progressivity. The first is an abstract question:

> Please indicate which of the following you think is more important?
>
> - Higher taxes should be levied on those who benefit more from public services.
> - Higher taxes should be levied on the rich people, even if they benefit little from public services.

The first option represents the less progressive tax system and explicitly corresponds to the idea of benefit-based taxation in that tax payment should be proportional to the benefit from public goods (Weinzierl 2017; Scherf and Weinzierl 2020). The second option is more in line with

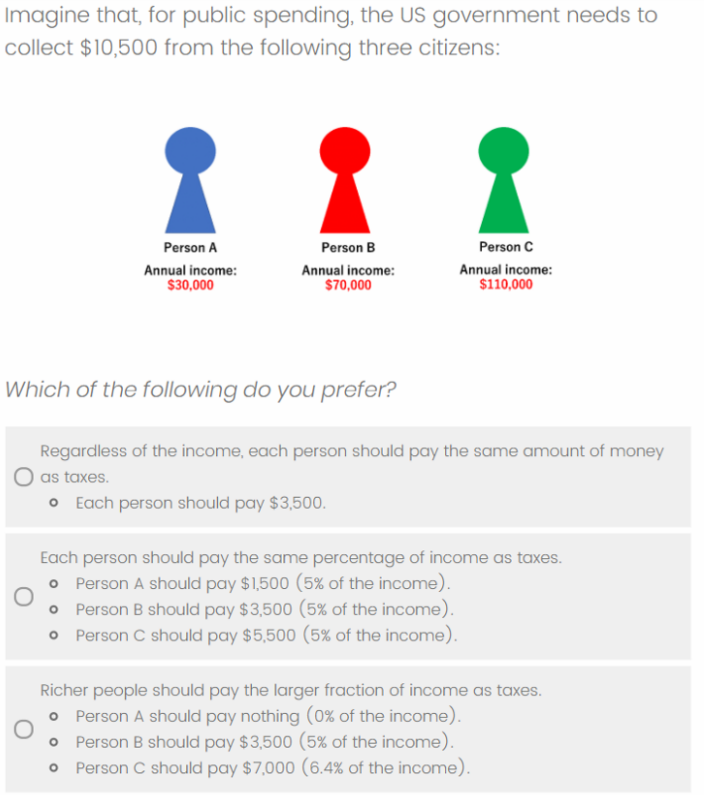


Figure 2: Second question for the tax progressivity

the traditional utilitarian view that places a higher value of marginal income on the poor and is more in favor of tax progressivity.

The second question concerns a more concrete situation, as shown in Figure 2. The respondents were asked to imagine a society consisting of three people and choose their most preferred system from a uniform tax system, proportional tax system, and progressive tax system. This question enables us to analyze detailed preferences for tax progressivity. We code the first option as 0, the second option as 0.5, and the third option as 1 to construct a variable for preferences for progressive taxation ranging from 0 to 1.

Preferences for spending progressivity The last set of questions is regarding spending progressivity (Hypothesis 3). To measure preferences for the spending structure, we use the following two questions. First, we ask how extra tax revenue should be used:

> Imagine that the government has an extra funding of a billion dollars. Which of the following comes closest to your view?

- The money should be spent to benefit everyone in the society.
- The money should be spent exclusively for helping the poor.

Note that we asked whether respondents support tax increase since Hypothesis 1 predicts increased support for a larger government. Here, we asked respondents how this extra revenue from governmental expansion should be used. The first option corresponds to no spending progressivity. The second option represents that the government should spend more money for not providing public goods but redistributing the income, implying a more progressive way to spend the extra revenue.

In addition to the effect on the spending of the extra revenue, the treatment might reduce support for the status quo redistributive policies. To test this, the second question asked whether to increase the spending for specific welfare policies:

> Should federal spending on food stamps be decreased, kept the same, or increased?
>
> Should federal spending on welfare programs be decreased, kept the same, or increased?
>
> Should federal spending on programs that assist blacks and other minorities be decreased, kept the same, or increased?
>
> Should federal spending on programs that assist the homeless be decreased, kept the same, or increased?

These questions were originally used by Peyton (2020) for measuring the effect of distrust in political support of redistributive policies. Following him, we aggregate the responses to these four questions to mitigate measurement errors. For each question, we coded "decreased" as 0, "kept the same" as 0.125, and "increased" as 0.25. Summing up the responses to these four questions leads to a measure of support for welfare policies spanning from 0 to 1.

4.4. Data and empirical specification

In total, 3673 individuals started to answer this survey, 3361 passed the attention check question, and 3275 completed the survey. Since our treatment required that respondents be seriously

engaged in the survey and remember the relevant information, samples that either took too short a time or too long for completing the survey were undesirable. To ensure that all respondents in our data seriously engaged in the survey, we dropped observations above the top 5% or bottom 5% percentile of the distribution of survey duration for each control and treatment group.[16] This left us 2953 respondents. The descriptive statistics is contained in Table 1 in the Appendix A.2.

The randomization of the treatment looks successful. In the Online Appendix, we investigate whether the characteristics of treatment and control groups are balanced, which implies successful random assignment. Overall, we find little evidence against it. Having said this, to be conservative about the balancing and improve statistical precision, we control for characteristics in our regression analyses.

We estimate the following linear regression model:

$$y_i = \tau T_i + X_i'\beta + \epsilon_i, \tag{1}$$

where y_i is the outcome variable and T_i represents the treatment dummy. The coefficient of interest is τ. X_i includes the constant term, gender, age and its square, marital status, whether self-reportedly urban resident, whether minority (non-white) or not, whether completed four years of college or more, household income, and self-identified political ideology as controls. ϵ_i is the error term. We estimate (1) by the ordinary least-square (OLS) using heteroskedasticity-robust standard errors.

5. Results

5.1. Manipulation check

We first examine whether the treatment increases the perceived benefit from public goods as intended. The upper panel of Figure 3 concerns the expected fraction of tax revenues used for the benefit of everyone (in percentage terms). For the treatment group, this value was asked

[16] For the control group (treatment group), we dropped observations with a duration of less than 139 (198) seconds and more than 822 (1068) seconds. We have checked the robustness of our results using a different sample selection criterion and confirmed that our results are robust to changing the sample selection criterion.

both before and after the treatment. The first row of the upper panel shows the comparison between the treatment and control groups before the treatment. This pre-treatment difference is close to zero, suggesting no pre-existing difference in the perceived benefit of public goods between the treatment and control groups. In contrast, the second part of the upper panel shows the comparison between the treatment and control groups after the treatment, which captures the treatment effect. The result shows that the treatment group increases their expected amount of taxes used for the benefits of all after the intervention by 11.55 points.[17]

The lower panel of Figure 3 shows the treatment effect on the question asking whether everyone in society more or less benefits from public spending regardless of their income. It also confirms that the treatment increases the respondents' awareness that public spending benefits by 17.1 percentage points. These large effects indicate that our treatment works as intended. Moreover, the strong treatment effect implies that treated people indeed think that benefits from public spending are more equally distributed, a prerequisite for Hypotheses 2 and 3 predicting reduced policy progressivity. Overall, our treatment had a substantial impact on the perceived amount of benefits from public goods.

5.2. Treatment effect on support for a larger government

How does realizing the public nature of government spending affect a respondent's view of the governmental role? Hypothesis 1 predicts that people increase their support for a larger government when they appreciate its role as the provider of goods and services that benefit everyone.

Consistent with this hypothesis, realizing the universal benefit of public goods provision increases the support for raising everyone's tax bill. The distribution of answers to the question about the preferences for the government size is presented in Figure 4. According to this figure, a vast majority of the respondents (63.7%) in the treatment group agree to increasing taxes and thereby expanding government size, while the control group is divided almost equally between supporters and opposers. This implies that while government expansion is politically con-

[17] We also looked at whether each respondent in the treatment group changed the answer before and after the treatment assignment. The result indicates that more than a half of them increased the perceived amount of the taxes used for the benefits. See Online Appendix.

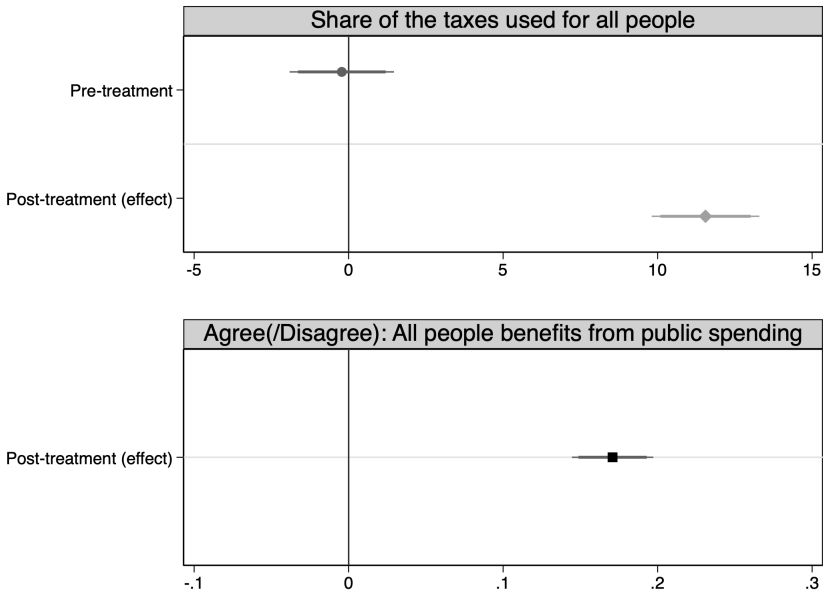


Figure 3: Manipulation check

Notes: The thin lines are the 95 % confidence intervals and the thick lines are 90% confidence intervals. Each dot is the estimated treatment effect based on the following regression equation $Outcome_i = (Treatment) + \beta Covariates_i + \epsilon_i$. Equation (1) provides the details of the specification. The outcome variable for the first panel is an answer to the question "How much of your taxes do you think are used for public goods and services that benefit all of you?" This is a continuous variable that takes from 0 to 100. The outcome variable for the lower panel is a binary variable coded as one (/zero) if the respondent chooses "agree (/disagree)" to the question: "Regardless of the income, everyone in the US more or less benefits from public spending."

tentious, our treatment might have an ability to break the deadlock. Although the generalization of this argument requires caution as our MTurk sample is not fully representative of the US population, it suggests the potential importance of our intervention as a way to reach a political agreement on government expansion.

Based on the regression analysis, this substantially large effect on preferences for the government size is confirmed. The result of estimating a linear probability model by OLS is presented in Figure 5a. Realizing the governmental role in providing public goods increases support for raising taxes by 10 percentage points. This effect is statistically significant at the 0.01 level. The strong increase in the support for the tax increase is remarkable given the ample evidence that increasing taxes often lead to less support for the government (e.g., Ardanaz, Hallerberg, and Scartascini, 2020; Hübscher, Sattler, and Wagner, 2021). Moreover, our result is also notable in that information about the governmental role in providing public goods substantially increases support for a larger government, while information can only have a limited impact on preferences for redistribution in a different context (Kuziemko et al. 2015).

We summarize our findings on the views about the larger government as follows.

Result 1. *Consistent with Hypothesis 1, people become more supportive of increasing taxes for a larger government after realizing governmental role in providing public goods.*

5.3. Treatment effect on support for tax progressivity

We saw that the treatment increased respondents' support for a larger government, which would promote redistribution (Proposition 1). However, redistribution may not be achieved if our treatment also reduces preference for tax progressivity. Based on the benefit tax view, Hypothesis 2 predicts that the treatment will decrease respondents' support for tax progressivity.

Against the hypothesis, we find no significant effects on preference for tax progressivity as presented in Figure 5b. For the first question, an abstract question, the point estimate is positive, but its effect size is fairly small; it increases support for progressive taxation only by 1.9 percentage points. This is not statistically significant. In addition, for the second question, a concrete question, the point estimate is negative, which is the opposite of the effect on the first

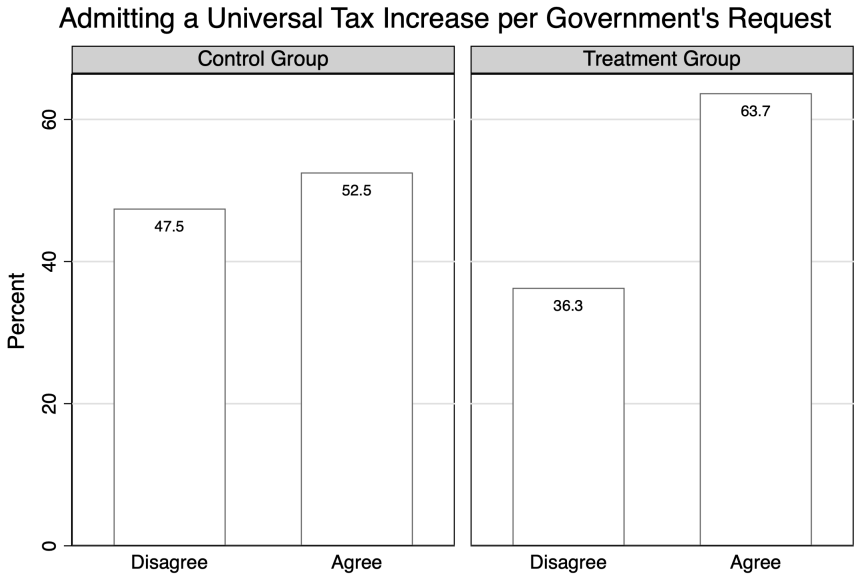


Figure 4: Preference for a larger government

Notes: This figure shows the response to the question: "Imagine that the government says it needs to increase everyone's tax bill by 1%. Do you agree with this tax increase?" separately for the control and treatment group.

question. Again, its effect size is nearly zero and statistically insignificant.[18] Overall, we find little effect on preference for tax progressivity, which we summarize as follows.

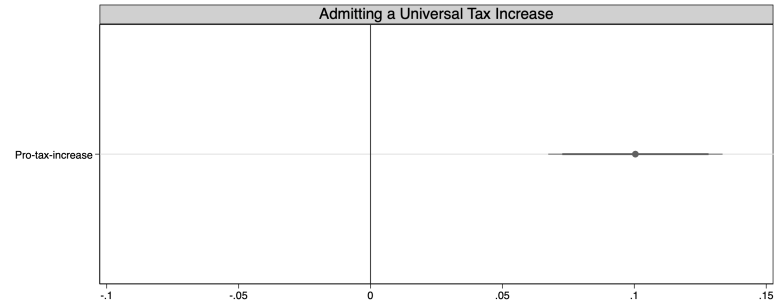
Result 2. *In contrast to Hypothesis 2, their preference for tax progressivity does not change much after realizing the governmental role in providing public goods.*

5.4. Treatment effect on support for spending progressivity

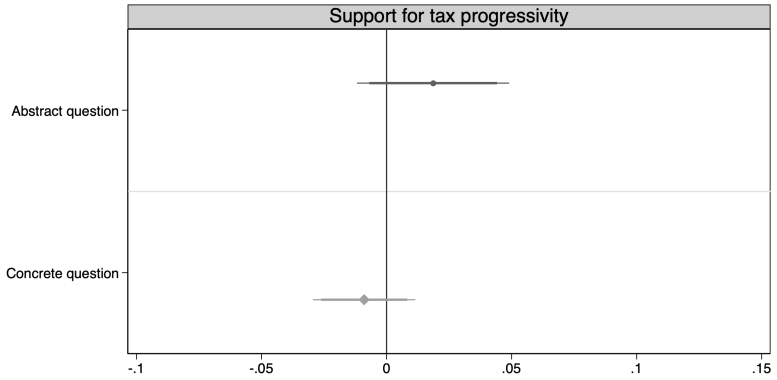
Although we have seen no impact on tax progressivity, redistribution might be prevented if our treatment reduces preference for spending progressivity. We test Hypothesis 3 predicting that the treatment decreases support for spending progressivity.

We have shown that the treatment increases support for collecting extra tax revenues. We first examine the effect on the spending allocation of this extra revenue, presented in the upper panel of Figure 5c. The treatment decreases support for using this extra money for the poor by 3.8 percentage points, which is statistically significant at the 0.05 level. While the effect size is small compared to the effect on the support for increasing tax, the treatment reduces support for

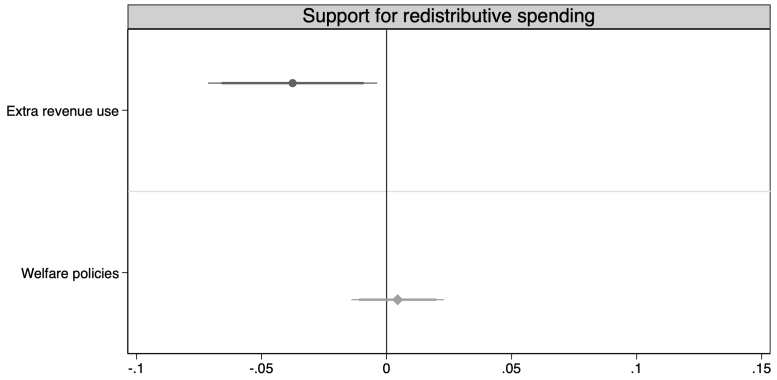
[18] See the detailed result of the concrete question in Figure B.2 in the Online Appendix.



(a) Preference for larger government



(b) Preference for tax progressivity



(c) Preference for spending progressivity

Figure 5: Treatment effects on main outcomes

Notes: The thin lines are the 95 % confidence intervals and the thick lines are 90% confidence intervals. Each dot is the estimated treatment effect based on the following regression equation $Outcome_i = (Treatment) + \beta Covariates_i + \epsilon_i$. Equation (1) provides the details of the specification. The outcome variable for (a) is a binary variable coded as one (/zero) if the respondent chooses "agree (/disagree)" to the question: "Imagine that the government says it needs to increase everyone's tax bill by 1%. Do you agree with this tax increase?" The outcome variable for the upper panel of (b) is a binary variable coded as one (/zero) if the respondent chooses "Higher taxes should be levied on the rich people, even if they benefit little from public services." (/"Higher taxes should be levied on those who benefit more from public services.") The outcome variable for the lower panel of (b) is a discrete variable, which takes 2 if progressive taxation is chosen, 1 if linear taxation is chosen, and 0 if capitation taxation is chosen in the concrete question for tax progressivity. The outcome variable for the upper panel of (c) is a binary variable coded as one (/zero) if the respondent chooses "The money should be spent exclusively for helping the poor." (/"The money should be spent to benefit everyone in the society.") to the question: "Imagine that the government has an extra funding of a billion dollars. Which of the following comes closest to your view?" Regarding the lower panel of (c), for each of the four questions about welfare policies, we first create a discrete variable which takes 1 if "increased" was chosen, 0.5 if "remained the same" was chosen, and 0 if "decreased" was chosen. The outcome variable is the average number across four questions.

using the extra revenue for the poor. In this sense, we might expect that the extra tax money due to governmental expansion would be spent somewhat more equally than in status-quo spending progressivity.

However, this does not necessarily imply that respondents reduce their support for status quo welfare policies. As in the lower panel of Figure 5c, the treatment does not change preference for status quo welfare policies: food stamps, welfare programs, assisting minorities, or assisting the homeless.[19] Thus, the existing targeted spending toward the poor would be at least maintained and the poor can also benefit from the extra spending due to governmental expansion as well. These results are summarized as follows.

Result 3. *In line with Hypothesis 3, realizing the governmental role in providing public goods decreases the support for using the extra revenue progressively, although its effect size is moderate. Furthermore, in contrast to Hypothesis 3, it does not change the preference for the status quo welfare policies toward the poor.*

To summarize our experimental results, realizing the governmental role of providing public goods substantially increases support for a larger government. In addition, although spending progressivity might be somewhat moderated toward equal spending, we find no evidence that status-quo tax progressivity is reduced, implying that policies can be as progressive as before.[20] Thus, in light of Proposition 1, public goods may enhance redistribution by allowing the government to expand via the change in public opinion.

6. Discussions

6.1. Treatment effect heterogeneity

Since political agreement is much easier when unanimous support is obtained, our treatment is arguably more relevant in practice if it exhibits no treatment effect heterogeneity. As discussed

[19] See Figure B.3 in the Online Appendix for the results of each question.

[20] In our survey, questions on policy progressivity were asked after the question on the support for a larger government. A potential concern is that the limited effect on policy progressivity may be simply attributed to this sequence of questions. However, this is inconsistent with the significant treatment effect on the political trust question that were asked at the near end of the survey.

in Hypothesis 4, we do not expect a significant treatment effect heterogeneity because the benefit tax view is prevalent regardless of demographic traits and political ideology (Weinzierl 2017). We investigate the treatment effect heterogeneity in four important dimensions: income, political ideology, sex, and race.[21] We find little heterogeneity in all dimensions, suggesting that information about the role of government in public goods provision might be an effective way to enhance redistribution regardless of political situations, such as the profile of the decisive voter and the degree of political polarization.

Little heterogeneous effect by income: The beneficiaries of government redistribution policies are limited to the low-income earners. Therefore, since Meltzer and Richard (1981), the literature has emphasized the role of income in the formation of preferences for redistribution. In contrast, public goods and services are for all people; thus, it is expected that realizing the benefits of public goods provision has a unanimous effect independently of the income level. Indeed, our data shows that the effect of the treatment on support for larger governments is positive and statistically significant for all income classes; the effect of the treatment on tax progressivity is not statistically significant for all income classes; the effect of the treatment on government spending progressivity is not statistically significant for all income classes (see Figure B.4 in the Online Appendix).[22] Overall, we find little treatment effect heterogeneity by income.

While the median voter theorem predicts that the median-income earner is a decisive voter (Meltzer and Richard, 1981), several empirical studies have shown that the interests of the high-income earners greatly influence the political process (e.g, Gilens, 2012; Grossmann, Mahmood, and Isaac, 2021). Hence, support for redistribution from not only the poor but also the rich is necessary for politically feasible redistribution. Our finding of little heterogeneity suggests that information about the role of government in public goods provision is an effective way to acquire support for redistribution independent of income levels.

[21] See Appendix B.2 for the regression equation estimated in this subsection.

[22] One potentially important heterogeneity is that our treatment reduces support for using extra tax money for the poor, which is barely statistically different from zero ($p = 0.058$). However, because the point estimate is negative for all three income groups, we cannot reject the null that the treatment effect for low-income earners is the same as for middle-income or high-income earners.

Note that we also examined if the treatment effect is heterogeneous depending on whether a household member receives food stamps or public assistance. The treatment effect on support for larger governments is positive in either case, whereas the treatment reduces support for spending progressivity only among those who do not receive food stamps or public assistance. See Figure B.5 in the Online Appendix.

Little heterogeneous effect by political ideology: Although it has been often documented that liberals and conservatives might respond differently to the same treatment in forming a preference for redistribution (e.g., Alesina, Stantcheva, and Teso 2018; Kishishita, Yamagishi, and Matsumoto 2022; Stantcheva 2021), we find little heterogeneity by political ideology. Figure B.6 in the Online Appendix repeats the same analysis as in Section 5 but allows for treatment effect heterogeneity between conservatives and liberals. For all outcome variables, the point estimates are quite similar.[23]

The absence of heterogeneity according to political ideology underscores the effectiveness of our treatment in achieving a political consensus. Generally speaking, conservatives are less likely to support redistribution. If informing about the benefit of public goods does not enhance support for larger governments or reduces support for policy progressivity among conservatives, then it would be difficult to overcome a political deadlock in promoting redistribution in the age of political polarization. This concern does not apply to our treatment since it is equally effective for both conservatives and liberals.

Little heterogeneous effect by sex: It has been documented that preferences for redistribution are heterogeneous by sex (Alesina and Giuliano 2011). If our treatment is effective only for men or women, it would be difficult to promote a political consensus for redistribution. Figure B.8 in the Online Appendix estimates the treatment effects separately for men and women. Although the effect on support for tax increase is stronger for women, the treatment is effective for both

[23]To address the concern that self-identified political ideology might not be accurate (e.g., Treier and Hillygus 2009; Ahler 2014), we also experimented with a revealed preference approach by examining the treatment effect heterogeneity between those who supported Joe Biden and those who supported Donald Trump in the presidential election in 2020. Our results change little (see Figure B.7 in the Online Appendix). Having said this, it should be noted that the question on the vote in the presidential election is also self-reported so that the answer to this question may not be fully accurate.

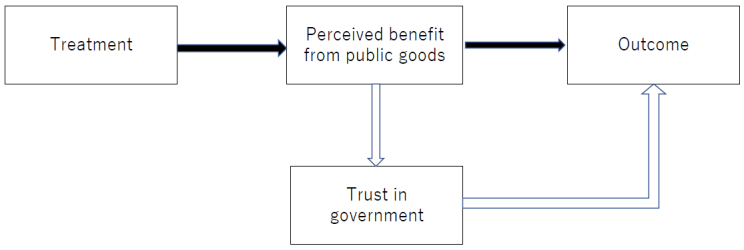


Figure 6: Trust in government as a potential mediator

men and women. There is no evidence of heterogeneity in other outcomes.

Little heterogeneous effect by minority status: Due to racial inequality, a large fraction of the poor people in the US belong to minority groups. It has been argued that whites, the majority, do not support redistribution toward these groups because they are not willing to help them (Alesina and Glaeser 2004). Thus, our treatment would not enhance redistribution if the treatment effect is strong only among the minorities. Figure B.9 in the Online Appendix estimates the treatment effects separately for whites and non-whites. We find little heterogeneity, implying that our treatment can enhance redistribution despite cultural and ethnic diversity.

We summarize this result as follows.

Result 4. *Consistent with Hypothesis 4, we found that the treatment works in the same direction independently of income level, political ideology, gender, and race.*

6.2. Little role of trust in government as mediator

In this subsection, we analyze trust in government, which prior studies claim might increase support for redistribution (Edlund 1999; Svallfors 2013; Kuziemko et al. 2015).[24] Figure 6 visualizes our mediation analysis in this section. While we assume that all treatment effects come through the perceived benefit from public goods, some of our treatment effects might arise because larger perceived benefit fosters trust in government. We test the significance of this channel indicated by white arrows in Figure 6.

[24] In contrast, Peyton (2020) experimentally shows that redistributive preferences are not affected by trust in government.

We asked respondents about their trust in the US government ("How much of the time do you think you can trust the government in Washington to do what is right?") as a post-treatment question.[25] We first examine the "first stage," that is, whether our treatment affects the trust level. Interestingly, in contrast to our arguments in section 6.1, we find a significant treatment effect heterogeneity by political ideology. Figure B.10 in the Online Appendix shows that while there is little treatment effect on the conservatives, liberals increased trust in government in response to our intervention.[26] While our survey does not reveal why such heterogeneity arises, one potential reason is that the conservatives have deep-rooted distrust in government and just informing about the benefit of public goods provided by the government is insufficient to mitigate it. Thus, the mediation of our treatment effect through trust in government, if any, is limited to liberals. However, even among liberals, controlling for trust in Washington has little effect on our results about the policy preferences, both qualitatively and quantitatively (see Figure B.11 in the Online Appendix).

Overall, we conclude that for conservatives, our treatment effects are not mediated by trust in government. Moreover, although mediation through trust in government might be present for liberals, this channel is too small to explain most of our treatment effects. Thus, our treatment effect works mainly through a different mechanism than trust in government. This result would also highlight the robustness of our treatment effects in the sense that the effects would be independent of the social configuration of trust in government.

6.3. Effect size in terms of perceived benefits from public goods

Our regression analyses have been based on the simple OLS regression that compares the control group and the treatment group, the latter informed of the benefit from public goods. In

[25] This question is the most common measure of political trust, and was used in the American National Election Studies (ANES). It is intended to capture respondents' support for political institutions rather than support for current presidency. Prior studies show that Democrats have more trust in the government than Republicans do if the president is from the Democratic Party, and vice versa. However, the relationship between partisan identification and trust is not a perfect correlation (see Citrin and Stoker, 2018, Figure 4). The question, at least partially, captures political trust rather than an evaluation of the current office.

[26] This result also alleviates the concern that respondents might negatively update their beliefs about the efficacy of the public sector. In principle, they might interpret the large spending on public goods as a signal that the government cannot efficiently provide a given level of public goods due to various reasons. However, the non-negative treatment effect on trust in government is inconsistent with this hypothesis.

this subsection, to facilitate interpretation, we follow an IV estimation strategy of Scheve and Stasavage (2022) and estimate the impact on policy preferences of 1 percentage point increase in the perceived benefits from public goods.

Specifically, we now replace the treatment dummy in (1) with the fraction of perceived benefits from public goods in percentage (see the first question in section 4.3), and use the treatment status as the IV for it. More formally,

$$y_i = \eta Benefit_i + X_i'\beta + \epsilon_i, \tag{2}$$

where $Benefit_i$ is the answer to the question "how much of your taxes do you think are used for public goods and services that benefit all of you?" in percentage points. We estimate (2) by the two-stage least- square (2SLS) while instrumenting for $Benefit_i$ by T_i, the treatment assignment. Since we have uncovered the large treatment effect on $Benefit_i$ in section 5, the remaining issue for the validity of the IV is the exclusion restriction. We assume that our treatment affects outcome variables only through the perceived benefit from public goods so that the exclusion restriction holds. While this exclusion restriction is arguably strong, assuming this allows us to express our treatment effect in units of the benefit level.

Table B.5 in Online Appendix presents the results. The F-stat in the first stage is 168.9, which is way above the conventional criterion of 10 and even passes a recently proposed criterion of 104.7 for weak instruments (Lee, McCrary, Moreira, and Porter 2022). Turning to the significantly estimated coefficients, a 1% increase in the perceived benefits from public goods leads to a 0.87% increase in the probability of accepting a universal tax increase and a 0.33% decrease in preferring extra tax money for everyone. The estimated coefficients for other outcomes are very close to zero and statistically insignificant.

6.4. Supplementary experiment: Public goods vs. welfare policies

While we have focused on the effect of realizing the governmental role in public goods provision, one might think that informing people of the effectiveness of welfare programs is a more direct and effective way to achieve support for reducing inequality. To examine this issue, we conducted

a supplementary experiment in February 2022 by using Amazon MTurk.[27] Following our sample selection criteria in the main experiment, we drop observations above the top 5% or bottom 5% percentile of the distribution of survey duration for each control and treatment group to ensure that all respondents in our data are seriously engaged in the survey, This leaves us with 1820 respondents, who were randomly assigned to one of the following two experiments. One experiment is the same as that of our baseline experiment, whereas the other experiment is designed to analyze the effect of realizing the effectiveness of welfare programs. Similar to the public goods case, half of the respondents participating in the latter experiment were randomly assigned to two passages regarding the effectiveness of welfare programs (food stamps and EITC). See the Online Appendix C for more details.

We obtain the following results. First, the replication of the main experiment is successful: informing about the governmental role in providing public goods increases support for a larger government by 10%, whereas its negative effects on tax progressivity and spending progressivity are either limited, or at least small, relative to the effect on the government size. Second, informing about the governmental role in providing welfare programs increases support for larger governments by 6.3%, whereas it has only a limited effect on tax progressivity. In addition, it increases support for welfare policies by 4.5%.

The comparison between these two treatment effects indicates the following. On the one hand, informing about the benefits of public goods could have a moderate negative effect for either tax or spending progressivity, while informing about the benefits of welfare program has no such effect. In this aspect, informing about the benefits of welfare programs may be better in reducing inequality. On the other hand, the effect on support for larger governments is bigger when informing about the benefits of public goods (10 percentage points) than informing about the benefits of welfare programs (6.3 percentage points). Informing about the benefit of public goods may be more effective from this perspective.

Overall, while we cannot rank unambiguously, informing about the benefits of public goods is comparably effective in inducing public opinions that help reduce inequality as informing

[27] This experiment was approved by the Tokyo University of Science Institutional Review Board (Protocol number 21003) and preregistered at AEA RCT Registry (https://www.socialscienceregistry.org/trials/8995).

about the benefits of welfare programs, though this difference is not statistically significant. Moreover, this information on public goods seems particularly more effective when expanding the government size contributes a lot to reducing inequality. Thus, although the information of public goods might seem somewhat auxiliary to inequality, its impact on policy preferences regarding taxation and redistribution is comparable to, or potentially more powerful than, the impact of the information about welfare programs that seem more directly related to inequality.

6.5. On the Experimenter Demand Effect

A universal concern for an experimental study is that respondents may infer the hypotheses of our experiment and try to help confirm them, which is called the experimenter demand effect. While we cannot fully rule out such a possibility, the experimenter demand effect is unlikely to be the main driver of our results for three reasons. First, recent several studies have found that such experimenter demand effects are not serious in survey experiments (e.g., Mummolo and Peterson, 2019).

Second, existing studies have shown that even directly providing information about severe inequality does not necessarily induce support for redistribution: its effect is often limited or exists only for some groups (e.g., Kuziemko et al., 2015; Alesina, Stantcheva, and Teso, 2018). For example, Stantcheva (2021) uses instructional videos about tax policies as a treatment, while Kuziemko et al. (2015) present several figures and tables, some of which are interactive, as a treatment. Our treatment, reading two brief passages and answering simple comprehension questions, would be relatively less demanding for respondents compared with ones used in the literature.

Third, our experimental results are also consistent with the limited role of the experimenter demand effect. One suggestive evidence is about the abstract question for the preference for spending progressivity. This question was asked near after the treatment, and the respondents should have inferred that they are expected to choose "[t]he money should be spend to benefit everyone in the society" because our treatment stated that the government activities are useful in maintaining everyone's life by using highways and public health as examples. However, the effect size on this question is only 3.8 percentage points (see Figure 5c), which is fairly smaller

than the effect on the support for tax increase. This suggests that an increase in the support for tax increase is not stemming from the experimenter demand effect (see also footnote 20). Another suggestive evidence is that our main results regarding the benefit of public goods are different from those in the supplementary treatment on the welfare programs (see Section 6.4). Such a difference cannot arise as long as our results are solely driven by the experimenter demand effect and it is similar in both experiments. Taken together, our results are unlikely to be the mere artifacts due to the experimenter demand effects.

6.6. Implications

We present two additional discussions. The first concerns the possibility that providing universal public benefits might lead to a society with less inequality. The second is the implications for the literature on benefit-based taxation.

Politically feasible redistribution and spending policies: The political feasibility of tax reforms has received significant attention in the literature on political economy of redistribution (e.g., Meltzer and Richard 1981; Bierbrauer, Boyer, and Peichl 2021). Our results highlight the importance of incorporating into theoretical analysis the impact of spending policies on support for tax reforms. Broadly speaking, a larger government would be supported if people perceive more benefits from public goods, which can be achieved either by providing more public goods or by informing citizens of the governmental role in public goods provision, as in our experimental manipulation.

This argument also implies that the Scandinavian welfare system might serve as a feasible role model of the redistribution for other countries. The Scandinavian system is often characterized by a large government that universally provides rich public services. They are often regarded as one of the most successful forms of the redistributive regime that has achieved low after-tax inequality indices (Moene and Wallerstein 2001; Rothstein 2015). However, whether such a regime is available in other countries has been debated due to different preferences and institutions (e.g., Kleven 2014; Almås, Cappelen, and Tungodden 2020). Our evidence from the US suggests that if the government universally serves citizens and they are aware of it, more

redistribution might be achieved by having a larger government like in Scandinavian countries.

Implications for benefit-based taxation: Benefit-based taxation has attracted renewed scholarly attention. Weinzierl (2017), for example, documented that benefit-tax views are popular among Americans. This view, although there are various versions, holds two key aspects: reciprocity toward the benefits from governments increases people's willingness to pay their own taxes and the expectation of others in society to exhibit the same reciprocity. In our experiment, Hypothesis 1 is based on the former while Hypothesis 2 is based on the latter. Our experimental results support the former component of benefit-based taxation, but not the latter.[28]

This result might be suggestive for public finance literature. For example, the literature on voting for tax schedules (Meltzer and Richard 1981; Bierbrauer, Boyer, and Peichl 2021) might better model voting behavior by considering reciprocity. Our result might also be suggestive on how to modify the planner's objective function in incorporating benefit-based views into the optimal taxation literature (Weinzierl 2018).

7. Concluding remarks

This paper uncovers a novel effect of public goods on inequality via public opinion: the effect of a change in public opinion about taxation and public expenditure. We conducted an online survey experiment in which the treatment group was informed of the universal benefits of public goods. We found that while the treatment unanimously enhanced support for a larger government, its impact on the desired tax and spending progressivity was limited. Moreover, there was little treatment effect heterogeneity in various dimensions. Thus, if people become aware that more public goods are provided than they previously thought, the government might politically achieve more redistribution through expanding its size without reducing policy progressivity. This result highlights that public goods are more powerful in reducing inequality than what the standard distributional analyses of public goods (e.g., Atkinson and Stiglitz 1980; Suàrez Serrato and

[28] Note, however, not detecting the treatment effect does not necessarily reject the latter part of the benefit-tax view because many people might hold the hard-wired benefit-tax view, which cannot be influenced by our treatment (Weinzierl 2017).

Wingender 2014; Boardman et al. 2017; Brülhart et al. 2022) suggest, once political constraints on government size are taken into account.

Our paper should be viewed as the first step for analyzing the importance of public goods provision in the political economy of government expansion. We point out two important challenges left for future research. First, it is important to understand how much our results matter quantitatively in designing actual policies. Incorporating our mechanism into recent political economy models of redistribution (e.g., Bierbrauer, Boyer, and Peichl 2021) would be a challenging but interesting avenue for answering this question. Second, how our results generalize to other contexts would require more investigation. For example, given differences in preferences and other institutional settings, using data from other countries would be important. Another interesting issue is how the nature of public goods matters. Although we focused on transportation and trash disposal systems, governments provide other public goods. Exploring how our results may or may not generalize to other public goods would be interesting.

References

Ahler, Douglas J. 2014. "Self-fulfilling misperceptions of public polarization." *The Journal of Politics* 76(3): 607–620.

Alesina, Alberto, and Edward Ludwig Glaeser. 2004. *Fighting poverty in the US and Europe: A world of difference*. Oxford University Press.

Alesina, Alberto, and Paola Giuliano. 2011. "Preferences for redistribution." In *Handbook of Social Economics*. Vol. 1 Elsevier , 93–131.

Alesina, Alberto, Stefanie Stantcheva, and Edoardo Teso. 2018. "Intergenerational mobility and preferences for redistribution." *American Economic Review* 108(2): 521–54.

Alm, James, Betty R Jackson, and Michael McKee. 1993. "Fiscal exchange, collective decision institutions, and tax compliance." *Journal of Economic Behavior & Organization* 22(3): 285–303.

Alm, James, Gary H McClelland, and William D Schulze. 1992. "Why do people pay taxes?" *Journal of Public Economics* 48(1): 21–38.

Almås, Ingvild, Alexander W Cappelen, and Bertil Tungodden. 2020. "Cutthroat capitalism versus cuddly socialism: Are Americans more meritocratic and efficiency-seeking than Scandinavians?" *Journal of Political Economy* 128(5): 1753–1788.

Ardanaz, Martín, Mark Hallerberg, and Carlos Scartascini. 2020. "Fiscal consolidations and electoral outcomes in emerging economies: Does the policy mix matter? Macro and micro level evidence from Latin America." *European Journal of Political Economy* 64: 101918.

Atkinson, Anthony B, and Joseph E Stiglitz. 1980. *Lectures on public economics*. Princeton University Press.

Barnes, Lucy, Avi Feller, Jake Haselswerdt, and Ethan Porter. 2018. "Information, knowledge, and attitudes: An evaluation of the taxpayer receipt." *The Journal of Politics* 80(2): 701–706.

Bierbrauer, Felix J, Pierre C Boyer, and Andreas Peichl. 2021. "Politically feasible reforms of nonlinear tax systems." *American Economic Review* 111(1): 153–91.

Boardman, Anthony E, David H Greenberg, Aidan R Vining, and David L Weimer. 2017. *Cost-benefit analysis: concepts and practice*. Cambridge University Press.

Brülhart, Marius, Jayson Danton, Raphaël Parchet, and Jörg Schläpfer. 2022. Who bears the burden of local taxes? CEPR Working Paper No. DP15826.

Buhrmester, Michael, Tracy Kwang, and Samuel D Gosling. 2011. "Amazon's Mechanical Turk: A New Source of Inexpensive, Yet High-Quality, Data?" *Perspectives on Psychological Science* 6(1): 3–5.

Citrin, Jack, and Laura Stoker. 2018. "Political trust in a cynical age." *Annual Review of Political Science* 21: 49–70.

Edlund, Jonas. 1999. "Trust in government and welfare regimes: Attitudes to redistribution

and financial cheating in the USA and Norway." *European Journal of Political Research* 35(3): 341–370.

Giaccobasso, Matias, Brad C Nathan, Ricardo Perez-Truglia, and Alejandro Zentner. 2022. Where Do My Tax Dollars Go? Tax Morale Effects of Perceived Government Spending. Working Paper 29789 National Bureau of Economic Research. http://www.nber.org/papers/w29789

Gilens, Martin. 2012. *Affluence and Influence: Economic Inequality and Political Power in America*. Princeton University Press.

Grossmann, Matt, Zuhaib Mahmood, and William Isaac. 2021. "Political Parties, Interest Groups, and Unequal Class Influence in American Policy." *The Journal of Politics* 83(4): 000–000.

Haaland, Ingar, Christopher Roth, and Johannes Wohlfart. 2020. "Designing Information Provision Experiments." *Journal of Economic Literature*: Forthcoming.

Hoy, Christopher, and Franziska Mager. 2021. "Why Are Relatively Poor People Not More Supportive of Redistribution? Evidence from a Randomized Survey Experiment across 10 Countries." *American Economic Journal: Economic Policy* 13(4): 299–328.

Hübscher, Evelyne, Thomas Sattler, and Markus Wagner. 2021. "Voter responses to fiscal austerity." *British Journal of Political Science* 51(4): 1751–1760.

Iversen, Torben, and Max Goplerud. 2018. "Redistribution without a median voter: Models of multidimensional politics." *Annual Review of Political Science* 21: 295–317.

Kishishita, Daiki, Atsushi Yamagishi, and Tomoko Matsumoto. 2022. "Overconfidence, income-ability gap, and preferences for income equality." *European Journal of Political Economy*: Forthcoming.

Kleven, Henrik Jacobsen. 2014. "How can Scandinavians tax so much?" *Journal of Economic Perspectives* 28(4): 77–98.

Kuklinski, James H, Paul J Quirk, Jennifer Jerit, David Schwieder, and Robert F Rich. 2000. "Misinformation and the currency of democratic citizenship." *The Journal of Politics* 62(3): 790–816.

Kuziemko, Ilyana, Michael I Norton, Emmanuel Saez, and Stefanie Stantcheva. 2015. "How elastic are preferences for redistribution? Evidence from randomized survey experiments." *American Economic Review* 105(4): 1478–1508.

Lee, David S, Justin McCrary, Marcelo J Moreira, and Jack Porter. 2022. "Valid t-ratio Inference for IV." *American Economic Review* 112: 3260–3290.

Luttmer, Erzo FP, and Monica Singhal. 2014. "Tax morale." *Journal of Economic Perspectives* 28(4): 149–68.

Meltzer, Allan H, and Scott F Richard. 1981. "A rational theory of the size of government." *Journal of Political Economy* 89(5): 914–927.

Moene, Karl Ove, and Michael Wallerstein. 2001. "Inequality, Social Insurance, and Redistribution." *American Political Science Review* 95(4): 859–874.

Moss, Aaron J, Cheskie Rosenzweig, Jonathan Robinson, and Leib Litman. 2020. "Demographic stability on Mechanical Turk despite COVID-19." *Trends in Cognitive Sciences* 24(9): 678–680.

Mullinix, Kevin J, Thomas J Leeper, James N Druckman, and Jeremy Freese. 2015. "The generalizability of survey experiments." *Journal of Experimental Political Science* 2(2): 109–138.

Mummolo, Jonathan, and Erik Peterson. 2019. "Demand effects in survey experiments: An empirical assessment." *American Political Science Review* 113(2): 517–529.

Peyton, Kyle. 2020. "Does trust in government increase support for redistribution? Evidence from randomized survey experiments." *American Political Science Review* 114(2): 596–602.

Rothstein, Bo. 2015. "The Moral, Economic, and Political Logic of the Swedish Welfare State." In *The Oxford Handbook of Swedish Politics*, ed. Jon Pierre. Oxford University Press.

Scherf, Robert, and Matthew Weinzierl. 2020. "Understanding different approaches to benefit-based taxation." *Fiscal Studies* 41(2): 385–410.

Scheve, Kenneth, and David Stasavage. 2022. "Equal Treatment and the Inelasticity of Tax Policy to Rising Inequality." *Comparative Political Studies*: Forthcoming.

Snowberg, Erik, and Leeat Yariv. 2021. "Testing the Waters: Behavior across Participant Pools." *American Economic Review* 111(2): 687–719.

Stantcheva, Stefanie. 2021. "Understanding tax policy: How do people reason?" *Quarterly Journal of Economics* 136(4): 2309–2369.

Suàrez Serrato, Juan Carlos, and Philippe Wingender. 2014. "Estimating the incidence of government spending." *Unpublished manuscript*.

Svallfors, Stefan. 2013. "Government Quality, Egalitarianism, and Attitudes to Taxes and Social Spending: A European Comparison." *European Political Science Review* 5(3): 363–380.

Treier, Shawn, and D Sunshine Hillygus. 2009. "The nature of political ideology in the contemporary electorate." *Public Opinion Quarterly* 73(4): 679–703.

Weinzierl, Matthew. 2017. "Popular acceptance of inequality due to innate brute luck and support for classical benefit-based taxation." *Journal of Public Economics* 155: 54–63.

Weinzierl, Matthew. 2018. "Revisiting the classical view of benefit-based taxation." *The Economic Journal* 128(612): F37–F64.

A. Appendix

A.1. Proof of Proposition 1

Note that $U^H = U(w_H - \tau G, 0, (1-\theta)G)$ and $U^L = U(w_L - (1-\tau)G, \theta G, (1-\theta)G)$.

(i). First,

$$\frac{\partial(U^H - U^L)}{\partial \tau} = -G(U_1^H + U_1^L),$$

which is negative because $U_1 > 0$.

Second,

$$\frac{\partial(U^H - U^L)}{\partial \theta} = -GU_2^L - GU_3^H + GU_3^L,$$

which is negative because $U_2^L > 0$ and $U_3^H = U_3^L$ from the additive separability of U.

(ii). Note first that

$$\frac{\partial(U_H - U_L)}{\partial G} = -\tau U_1^H + (1-\tau)U_1^L - \theta U_2^L + (1-\theta)U_3^H - (1-\theta)U_3^L.$$

Since, $U_2^L > 0$ and $U_3^H = U_3^L$, this is strictly negative when $\tau = 1$ and $\theta > 0$. Furthermore, it is decreasing in τ. Thus, we have proved (ii).

(iii). Under the quasi-linear utility function,

$$\frac{\partial(U_H - U_L)}{\partial G} = 1 - 2\tau - \theta V_1'(g_L).$$

Hence, as long as $\tau \geq 1/2$, $\theta \geq 0$, and at least one of the two inequalities holds strictly, this is negative. □

A.2. Summary statistics

We provide the descriptive statics of the full sample. Our sample is close to the typical sample obtained using MTurk (see Snowberg and Yariv, 2021, Online Appendix, Table A.1). Our sample is younger, more educated, poorer, and has fewer minorities than the US representative sample.

	mean	sd	min	max	count
Female	0.47	0.499	0	1	2953
Age	41.31	12.841	18	89	2953
Married	0.57	0.495	0	1	2953
Urban areas	0.38	0.485	0	1	2953
Suburban areas	0.44	0.497	0	1	2953
Rural areas	0.18	0.383	0	1	2953
Minority	0.26	0.441	0	1	2953
Bachelor or higher	0.69	0.461	0	1	2953
Household income: $0 - $25,000	0.11	0.315	0	1	2953
Household income: $25,001 - $50,000	0.28	0.451	0	1	2953
Household income: $50,001 -$75,000	0.25	0.433	0	1	2953
Household income: $75,001 $100,000	0.18	0.383	0	1	2953
Household income: $100,001 - $125,000	0.08	0.268	0	1	2953
Household income: $125,001 - $150,000	0.05	0.213	0	1	2953
Household income: More than $150,000	0.05	0.217	0	1	2953
Liberal	0.26	0.440	0	1	2953
Moderately liberal	0.33	0.470	0	1	2953
Moderately conservative	0.24	0.427	0	1	2953
Conservative	0.17	0.375	0	1	2953

Table 1: Summary statistics

Online appendix for "More public goods, larger government, and more redistribution" (Not for publication)

B. Main experiment

B.1. Balance test

	Control	Treatment	Difference
Age	41.481	41.132	-0.350
	(12.916)	(12.766)	(0.473)
Female	0.482	0.463	-0.019
	(0.500)	(0.499)	(0.018)
Minority	0.270	0.258	-0.012
	(0.444)	(0.438)	(0.016)
Household income[a]	3.192	3.141	-0.050
	(1.580)	(1.525)	(0.057)
Living Areas[b]	1.805	1.794	-0.011
	(0.710)	(0.728)	(0.026)
Married	0.574	0.570	-0.003
	(0.495)	(0.495)	(0.018)
4-year-college or more	0.700	0.686	-0.014
	(0.458)	(0.464)	(0.017)
Political ideology[c]	2.340	2.289	-0.051
	(1.050)	(1.028)	(0.038)
Observations	1,496	1,457	2,953

Table B.1: Balance test

[a] We code household income between \$0-\$25,000 as 1, \$25,001-\$50,000 as 2, \$50,001-\$75,000 as 3, \$75,001-\$100,000 as 4, \$100,001-\$125,000 as 5, \$125,001-\$150,000 as 6, more than \$150,000 as 7.
[b] We code urban as 1, suburban as 2, and rural as 3.
[c] We code liberal as 1, moderately liberal as 2, moderately conservative as 3, and conservative as 4.

B.2. Regression equation with heterogeneous treatment effects

As an extension of (1), we also account for the heterogeneity depending on either income, political ideologies, sex, or race. The regression specification when accounting for the heterogeneity depending on income is as follows:

$$y_i = \sum_{income=[high,middle,low]} \tau_{income} T_i \times I(income_i = income) + \sum_{income=[high,middle]} \alpha_{income} I(income_i = income) + X_i'\beta + \epsilon_i. \quad \text{(B.1)}$$

The coefficients of interest are $(\tau_{high}, \tau_{middle}, \tau_{low})$, describing the treatment effect for people with the corresponding income position.[29] We classify respondents with household income less than \$50,000 as low income, between \$50,001-\$100,000 as middle income, and more than \$100,000 as high income. Note that the effect of having the low income ("α_{low}") is absorbed in the constant term in X_i. The specification for other heterogeneity is also given in a similar way.

B.3. Omitted tables and figures

Regression table for the main analysis: See Table B.2.

Figure for individual response to the treatment in the first-stage: See Figure B.1.

Figure for the detailed analysis of the concrete question about tax progressivity: See Figure B.2. The regression table for this analysis is reported in Table B.3.

Figure for the detailed analysis of the effect on the support for welfare policies: See Figure B.3. The regression table for this analysis is reported in Table B.4

Table for the IV results: See Table B.5.

Figure for the heterogeneous treatment effect by income: See Figure B.4. The regression table for this analysis is reported in Table B.6.

Figure for the heterogeneous treatment effect by receiving public assistance: See Figure B.5. The regression table for this analysis is reported in Table B.7.

Figure for the heterogeneous treatment effect by political ideology: See Figure B.6. The regression table for this analysis is reported in Table B.8.

Figure for the heterogeneous treatment effect by political ideology (voting destination): See Figure B.7. The regression table for this analysis is reported in Table **??**.

Figure for the heterogeneous treatment effect by sex: See Figure B.8. The regression table for this analysis is reported in Table B.10.

Figure for the heterogeneous treatment effect by race: See Figure B.9. The regression table for this analysis is reported in Table B.11

[29] This specification can be rewritten as in Table B.2, which is what we actually coded in the analysis.

Figure for the effect on the trust in government: See Figure B.10 and Figure B.11. The regression tables for these analyses are reported in Table B.12 for Figure B.10 and Table B.13 for Figure B.11.

	Manipulation check			Government size	Tax progressivity		Spending progressivity	
	Tax amounts used for all		Perceived benefits	Admitting tax increase	Abstract question	Concrete question	Extra revenue use	Welfare policies
	Before treatment	After treatment						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treatment	-0.221	11.550***	0.171***	0.100***	0.019	-0.009	-0.038**	0.004
	(0.862)	(0.889)	(0.013)	(0.017)	(0.016)	(0.010)	(0.017)	(0.009)
Female	-3.021***	-0.955	0.014	-0.042**	0.010	0.016	-0.016	0.018*
	(0.881)	(0.906)	(0.013)	(0.017)	(0.016)	(0.010)	(0.018)	(0.009)
Age	-0.527**	-0.401*	-0.003	-0.009**	0.002	0.002	-0.001	-0.001
	(0.239)	(0.239)	(0.003)	(0.004)	(0.004)	(0.003)	(0.004)	(0.002)
Age^2	0.005*	0.004	0.000	0.000*	-0.000	-0.000	0.000	0.000
	(0.003)	(0.003)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Married	13.244***	10.357***	0.052***	0.214***	-0.107***	-0.087***	0.017	-0.030***
	(0.948)	(0.995)	(0.016)	(0.019)	(0.017)	(0.012)	(0.020)	(0.011)
Suburban areas	-8.136***	-6.244***	-0.041***	-0.126***	0.030*	0.025**	-0.027	-0.023**
	(1.008)	(1.036)	(0.016)	(0.019)	(0.018)	(0.012)	(0.020)	(0.011)
Rural areas	-7.876***	-7.932***	-0.009	-0.113***	0.001	0.014	-0.004	-0.031**
	(1.298)	(1.324)	(0.020)	(0.025)	(0.024)	(0.015)	(0.026)	(0.014)
Minority	2.403**	2.731***	0.037**	-0.017	-0.004	-0.031**	0.020	-0.007
	(1.007)	(1.028)	(0.015)	(0.019)	(0.018)	(0.013)	(0.021)	(0.011)
Bachelor or higher	11.434***	9.938***	0.059***	0.098***	-0.025	-0.004	-0.029	0.007
	(1.016)	(1.070)	(0.017)	(0.021)	(0.017)	(0.012)	(0.020)	(0.011)
Household income:	-1.429	-0.172	0.016	0.007	-0.003	-0.003	-0.020	-0.031*
$25,001 - $50,000	(1.522)	(1.602)	(0.025)	(0.030)	(0.024)	(0.018)	(0.031)	(0.016)
Household income:	-1.393	-0.980	-0.001	-0.012	-0.012	-0.001	-0.031	-0.062***
$50,001 -$75,000	(1.606)	(1.669)	(0.027)	(0.032)	(0.027)	(0.020)	(0.033)	(0.017)
Household income:	-5.632***	-4.477**	-0.003	-0.056*	-0.045	-0.024	-0.030	-0.078***
$75,001 $100,000	(1.704)	(1.772)	(0.028)	(0.033)	(0.030)	(0.021)	(0.035)	(0.019)
Household income:	-1.980	-1.264	-0.010	-0.056	0.009	-0.010	-0.082**	-0.074***
$100,001 - $125,000	(2.120)	(2.170)	(0.034)	(0.040)	(0.037)	(0.026)	(0.042)	(0.023)
Household income:	-4.519*	-3.456	0.062*	-0.101**	-0.041	-0.002	-0.124***	-0.087***
$125,001 - $150,000	(2.657)	(2.551)	(0.036)	(0.049)	(0.044)	(0.029)	(0.047)	(0.027)
Household income:	-11.131***	-8.017***	-0.016	-0.130***	-0.026	-0.021	-0.139***	-0.075***
More than $150,000	(2.500)	(2.585)	(0.039)	(0.047)	(0.040)	(0.029)	(0.045)	(0.027)
Moderately liberal	-2.190*	-0.919	-0.022	-0.092***	-0.042**	-0.052***	-0.130***	-0.106***
	(1.121)	(1.159)	(0.016)	(0.022)	(0.017)	(0.013)	(0.024)	(0.012)
Moderately conservative	-6.749***	-5.907***	-0.115***	-0.328***	-0.219***	-0.153***	-0.313***	-0.312***
	(1.249)	(1.285)	(0.020)	(0.024)	(0.022)	(0.015)	(0.025)	(0.013)
Conservative	2.673*	2.726*	-0.106***	-0.216***	-0.328***	-0.205***	-0.305***	-0.303***
	(1.464)	(1.493)	(0.022)	(0.025)	(0.027)	(0.018)	(0.027)	(0.016)
Constant	47.961***	43.810***	0.780***	0.825***	0.842***	0.822***	0.661***	0.901***
	(5.273)	(5.308)	(0.080)	(0.099)	(0.088)	(0.059)	(0.101)	(0.054)
N	2953	2953	2953	2953	2953	2953	2953	2953
R^2	0.203	0.182	0.087	0.156	0.116	0.109	0.079	0.236

Notes: For each row, the coefficient and p-value are from the regressions of the form assigned to $Outcome_i = \alpha + \beta Covariates_i + \epsilon_i$, where $Covariates$ are listed to the left in the row. + Significant at the 10% level. * Significant at the 5% level. ** Significant at the 1% level. *** Significant at the 0.1% level.

Table B.2: Regression results for Figure 3 and Figure 5

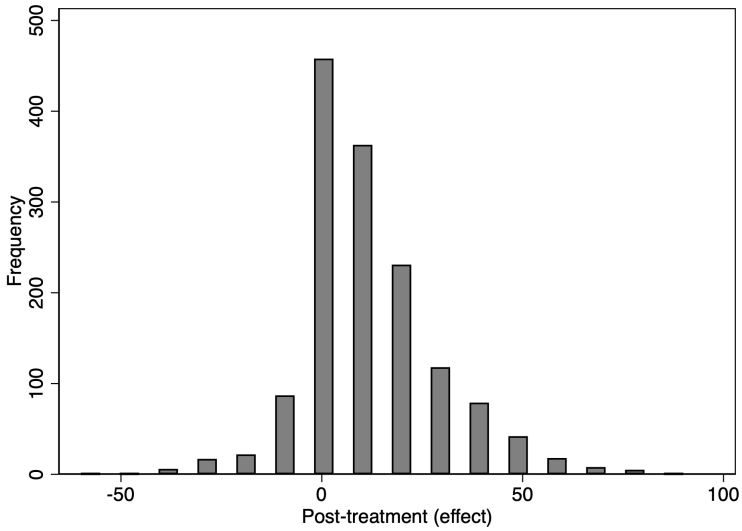


Figure B.1: Individual response for the first-stage

Notes: Both before and after the treatment, respondents in the treatment group answered the following question:"How much of your taxes do you think are used for public goods and services that benefit all of you?" This is a continuous variable that takes from 0 to 100. The figure shows the distribution of the answer after the treatment minus that before the treatment.

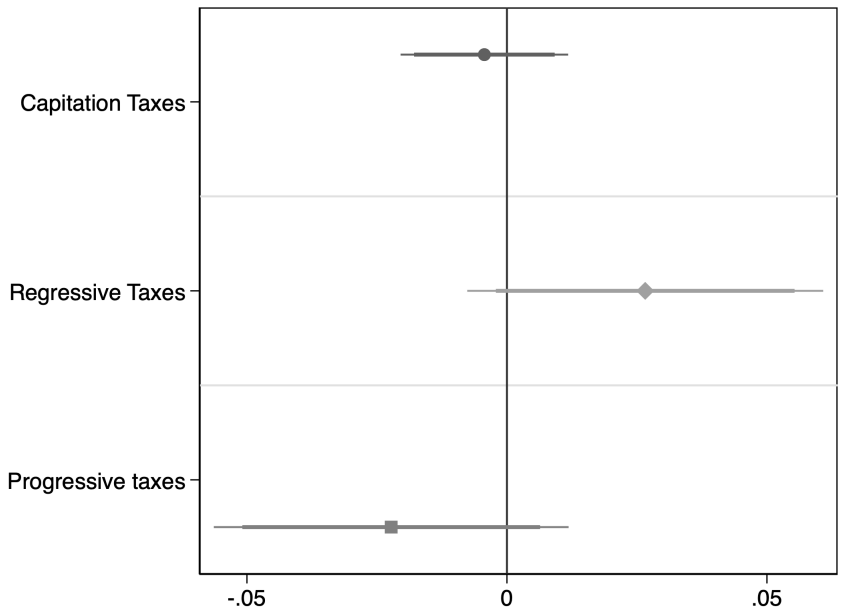


Figure B.2: Detailed responses for the concrete question about tax progressivity

Notes: The thin lines are the 95 % confidence intervals and the thick lines are 90% confidence intervals. Each dot is the estimated treatment effect based on the following regression equation $Outcome_i = (Treatment) + \beta Covariates_i + \epsilon_i$. Equation (1) provides the details of the specification. The outcome variables are discrete variables coded as 1(/0) if the respondent chooses (/does not choose) the corresponding option.

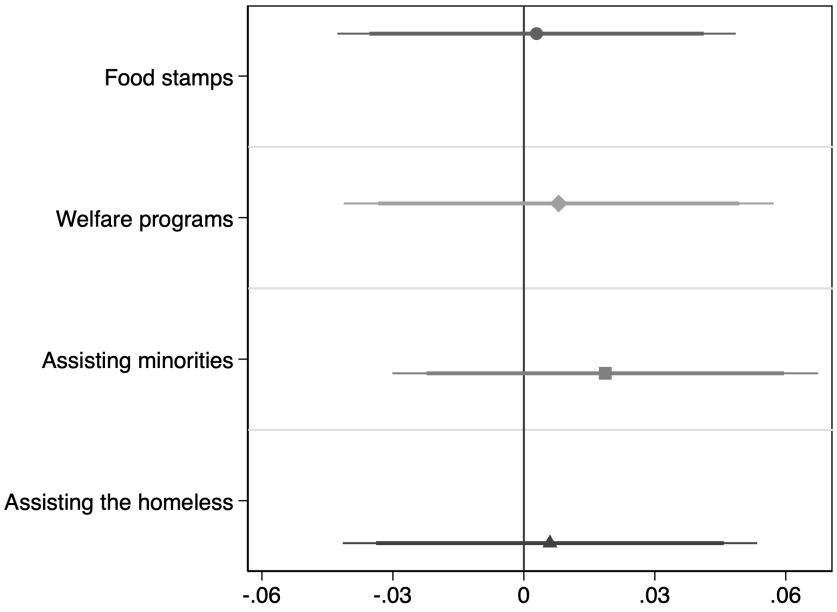


Figure B.3: Detailed responses for the question about status-quo redistributive spending

Notes: The thin lines are the 95 % confidence intervals and the thick lines are 90% confidence intervals. Each dot is the estimated treatment effect based on the following regression equation $Outcome_i = (Treatment) + \beta Covariates_i + \epsilon_i$. Equation (1) provides the details of the specification. The outcome variables are discrete variables coded as three if the respondent increases, two if she keeps the same, and one if she decreases.

	(1) Capitation Taxes	(2) Regressive Taxes	(3) Progressive Taxes
Treatment	-0.004	0.027	-0.022
	(0.008)	(0.017)	(0.017)
Female	-0.020**	0.007	0.013
	(0.008)	(0.018)	(0.018)
Age	-0.001	-0.001	0.002
	(0.002)	(0.004)	(0.004)
Age^2	0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)
Married	0.038***	0.098***	-0.136***
	(0.009)	(0.020)	(0.020)
Suburban areas	-0.021**	-0.008	0.029
	(0.010)	(0.020)	(0.020)
Rural areas	-0.037***	0.047*	-0.010
	(0.011)	(0.026)	(0.026)
Minority	0.017	0.029	-0.046**
	(0.010)	(0.021)	(0.020)
Bachelor or higher	0.007	-0.005	-0.001
	(0.009)	(0.021)	(0.020)
Household income: $25,001 - $50,000	-0.015	0.036	-0.021
	(0.015)	(0.030)	(0.030)
Household income: $50,001 -$75,000	-0.030*	0.063**	-0.033
	(0.016)	(0.032)	(0.032)
Household income: $75,001 $100,000	-0.030*	0.107***	-0.077**
	(0.017)	(0.034)	(0.034)
Household income: $100,001 - $125,000	-0.041**	0.102**	-0.061
	(0.020)	(0.043)	(0.043)
Household income: $125,001 - $150,000	-0.036	0.077	-0.041
	(0.023)	(0.048)	(0.048)
Household income: More than $150,000	-0.018	0.079*	-0.061
	(0.025)	(0.048)	(0.047)
Moderately liberal	-0.013	0.129***	-0.116***
	(0.009)	(0.022)	(0.022)
Moderately conservative	0.021*	0.262***	-0.284***
	(0.012)	(0.024)	(0.025)
Conservative	0.062***	0.286***	-0.348***
	(0.016)	(0.028)	(0.028)
Constant	0.094**	0.168*	0.738***
	(0.045)	(0.099)	(0.099)
N	2953	2953	2953
R^2	0.032	0.082	0.112

Notes: For each row, the coefficient and p-value are from the regressions of the form assigned to $Outcome_i = \alpha + \beta Covariates_i + \epsilon_i$, where $Covariates$ are listed to the left in the row. + Significant at the 10% level. * Significant at the 5% level. ** Significant at the 1% level. *** Significant at the 0.1% level.

Table B.3: Regression results for Figure B.2

	(1) Food stamps	(2) Welfare programs	(3) Assisting minorities	(4) Assisting the homeless
Treatment	0.003	0.008	0.019	0.006
	(0.023)	(0.025)	(0.025)	(0.024)
Female	0.025	0.001	0.057**	0.058**
	(0.023)	(0.025)	(0.025)	(0.024)
Age	-0.003	-0.000	-0.011*	0.005
	(0.006)	(0.006)	(0.006)	(0.006)
Age^2	0.000	-0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Married	-0.053**	-0.036	-0.067**	-0.088***
	(0.026)	(0.029)	(0.027)	(0.027)
Suburban areas	-0.068***	-0.075***	-0.020	-0.017
	(0.026)	(0.029)	(0.028)	(0.028)
Rural areas	-0.105***	-0.071*	-0.037	-0.038
	(0.036)	(0.038)	(0.038)	(0.036)
Minority	-0.042	-0.065**	0.056*	-0.007
	(0.028)	(0.030)	(0.029)	(0.029)
Bachelor or higher	0.011	0.040	0.090***	-0.083***
	(0.027)	(0.029)	(0.028)	(0.028)
Household income: $25,001 - $50,000	-0.058	-0.101**	-0.044	-0.043
	(0.040)	(0.042)	(0.041)	(0.040)
Household income: $50,001 -$75,000	-0.126***	-0.164***	-0.090**	-0.118***
	(0.042)	(0.046)	(0.045)	(0.044)
Household income: $75,001 $100,000	-0.185***	-0.205***	-0.132***	-0.103**
	(0.047)	(0.049)	(0.048)	(0.047)
Household income: $100,001 - $125,000	-0.158***	-0.193***	-0.129**	-0.110*
	(0.055)	(0.059)	(0.060)	(0.059)
Household income: $125,001 - $150,000	-0.277***	-0.214***	-0.122*	-0.081
	(0.064)	(0.072)	(0.074)	(0.067)
Household income: More than $150,000	-0.149**	-0.247***	-0.089	-0.119*
	(0.063)	(0.066)	(0.065)	(0.069)
Moderately liberal	-0.222***	-0.238***	-0.207***	-0.178***
	(0.030)	(0.032)	(0.031)	(0.028)
Moderately conservative	-0.564***	-0.694***	-0.710***	-0.530***
	(0.033)	(0.035)	(0.034)	(0.034)
Conservative	-0.521***	-0.603***	-0.676***	-0.623***
	(0.041)	(0.043)	(0.043)	(0.042)
Constant	2.762***	2.831***	2.866***	2.749***
	(0.133)	(0.144)	(0.141)	(0.138)
N	2953	2953	2953	2953
R^2	0.142	0.167	0.192	0.147

Notes: For each row, the coefficient and p-value are from the regressions of the form assigned to $Outcome_i = \alpha + \beta Covariates_i + \epsilon_i$, where $Covariates$ are listed to the left in the row. + Significant at the 10% level. * Significant at the 5% level. ** Significant at the 1% level. *** Significant at the 0.1% level.

Table B.4: Regression results for Figure B.3

	Government size	Tax progressivity		Spending progressivity	
	Admitting tax increase	Abstract question	Concrete question	Extra revenue use	Welfare policies
Perceived benefit from public goods ($Benefit_i$)	0.0087*** (0.0014)	0.0016 (0.0013)	-0.0008 (0.0009)	-0.0033** (0.0015)	0.0004 (0.0008)
Controls	Yes	Yes	Yes	Yes	Yes
First-stage F	168.9	168.9	168.9	168.9	168.9
N	2953	2953	2953	2953	2953
R^2	0.252	0.108	0.109	0.045	0.242

Robust standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table B.5: IV results (benefit instrumented by treatment status)

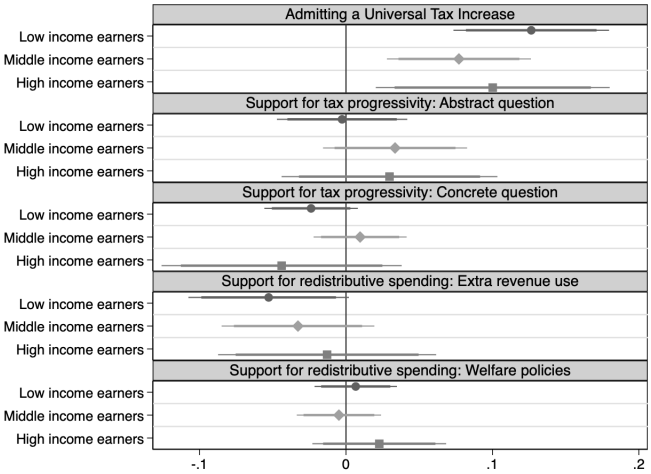


Figure B.4: Heterogeneous treatment effects: potential role of income heterogeneity

Notes: The thin lines are the 95 % confidence intervals and the thick lines are 90% confidence intervals. Each dot is the estimated treatment effect based on the following regression equation $Outcome_i = (Treatment\ terms) + \beta Covariates_i + \epsilon_i$. Equation (B.1) in Online Appendix provides the details of the specification. The outcome variable for the first panel is a binary variable coded as one (/zero) if the respondent chooses "agree (/disagree)" to the question: "Imagine that the government says it needs to increase everyone's tax bill by 1%. Do you agree with this tax increase?" The outcome variable for the second panel is a binary variable coded as one (/zero) if the respondent chooses "Higher taxes should be levied on the rich people, even if they benefit little from public services." (/"Higher taxes should be levied on those who benefit more from public services.") The outcome variable for the third panel is a discrete variable, which takes 2 if the progressive taxation is chosen, 1 if the linear taxation is chosen, and 0 if the capitation taxation is chosen in the concrete question for tax progressivity. The outcome variable for the fourth panel is a binary variable coded as one (/zero) if the respondent chooses "The money should be spent exclusively for helping the poor." (/"The money should be spent to benefit everyone in the society.") to the question: "Imagine that the government has an extra funding of a billion dollars. Which of the following comes closest to your view?" Regarding the fifth panel, for each of the four questions about welfare policies, we first create a discrete variable which takes 1 if "increased" was chosen, 0.5 if "remained the same" was chosen, and 0 if "decreased" was chosen. The outcome variable is the average number across four questions.

	(1)	(2)	(3)	(4)	(5)
		Support for tax progressivity :		Support for redistributive spending:	
	Admit a universal tax increase	Abstract question	Concrete question	Extra revenue use	Welfare policies
Treatment	0.077***	0.034	0.010	-0.033	-0.005
	(0.025)	(0.025)	(0.016)	(0.027)	(0.015)
Low income	0.011	0.041*	0.025	0.025	0.040***
	(0.027)	(0.025)	(0.017)	(0.028)	(0.015)
Treatment×Low income	0.049	-0.036	-0.033	-0.020	0.011
	(0.037)	(0.034)	(0.023)	(0.039)	(0.021)
High income	-0.070**	0.014	0.014	-0.088***	-0.022
	(0.033)	(0.032)	(0.021)	(0.033)	(0.019)
Treatment×High income	0.023	-0.004	-0.030	0.020	0.028
	(0.048)	(0.045)	(0.030)	(0.046)	(0.028)
Female	-0.045***	0.009	0.016	-0.016	0.017*
	(0.017)	(0.016)	(0.011)	(0.018)	(0.010)
Age	-0.009**	0.002	0.002	-0.001	-0.001
	(0.004)	(0.004)	(0.003)	(0.004)	(0.002)
Age^2	0.000*	-0.000	-0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Married	0.214***	-0.108***	-0.087***	0.016	-0.033***
	(0.019)	(0.017)	(0.011)	(0.019)	(0.011)
Suburban areas	-0.127***	0.029*	0.024**	-0.028	-0.022**
	(0.019)	(0.018)	(0.012)	(0.020)	(0.011)
Rural areas	-0.114***	0.000	0.013	-0.005	-0.031**
	(0.025)	(0.024)	(0.015)	(0.026)	(0.014)
Minority	-0.017	-0.004	-0.032**	0.020	-0.008
	(0.019)	(0.018)	(0.013)	(0.021)	(0.011)
Bachelor or higher	0.098***	-0.027	-0.006	-0.031	0.005
	(0.021)	(0.017)	(0.012)	(0.020)	(0.011)
Moderately liberal	-0.092***	-0.043**	-0.052***	-0.132***	-0.107***
	(0.022)	(0.017)	(0.013)	(0.024)	(0.012)
Moderately conservative	-0.330***	-0.221***	-0.154***	-0.315***	-0.314***
	(0.024)	(0.022)	(0.015)	(0.024)	(0.013)
Conservative	-0.216***	-0.328***	-0.204***	-0.307***	-0.304***
	(0.025)	(0.027)	(0.018)	(0.027)	(0.016)
Constant	0.816***	0.814***	0.805***	0.630***	0.835***
	(0.097)	(0.087)	(0.058)	(0.098)	(0.053)
N	2953	2953	2953	2953	2953
R^2	0.155	0.115	0.109	0.079	0.235

Notes: For each row, the coefficient and p-value are from the regressions of the form assigned to $Outcome_i = \alpha + \beta Covariates_i + \epsilon_i$, where $Covariates$ are listed to the left in the row. + Significant at the 10% level. * Significant at the 5% level. ** Significant at the 1% level. *** Significant at the 0.1% level.

Table B.6: Regression results for Figure B.4

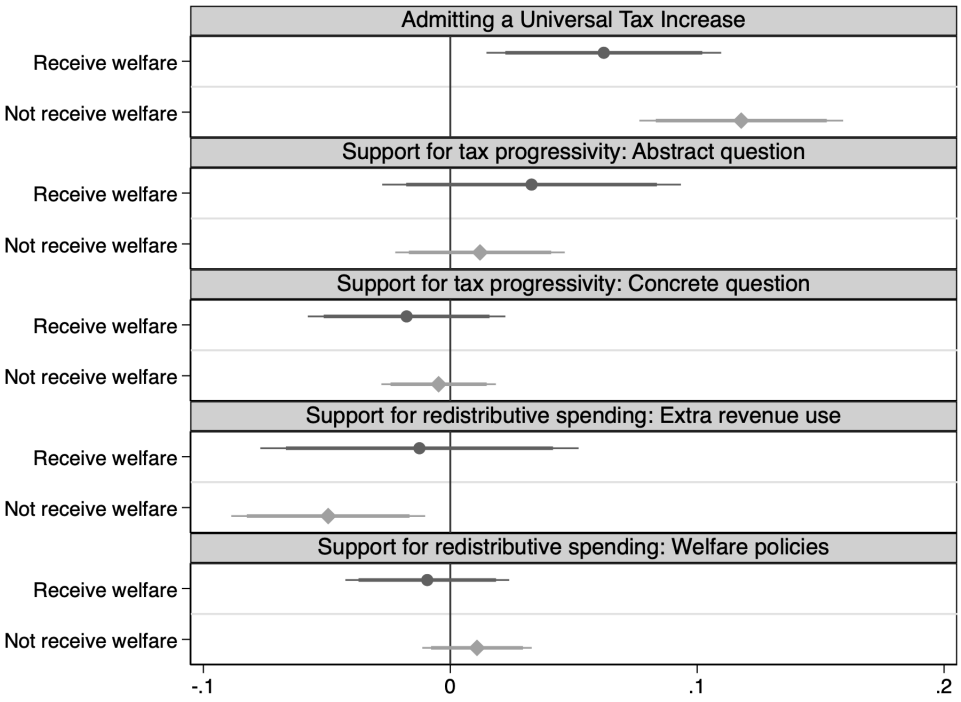


Figure B.5: Heterogeneous treatment effects: potential role of receiving welfare

Notes: The thin lines are the 95 % confidence intervals and the thick lines are 90% confidence intervals. Each dot is the estimated treatment effect based on the following regression equation $Outcome_i = (Treatment\ terms) + \beta Covariates_i + \epsilon_i$. Equation (B.1) in Online Appendix provides the details of the specification. To see the impact of whether to receive welfare, we add the following independent variable which is a binary one coded as one (/zero) if the respondent chooses "yes (/no)" to the question : "Do you or any member of your household currently receive food stamps or public assistance income?" The outcome variable for the first panel is a binary variable coded as one (/zero) if the respondent chooses "agree (/disagree)" to the question: "Imagine that the government says it needs to increase everyone's tax bill by 1%. Do you agree with this tax increase?" The outcome variable for the second panel is a binary variable coded as one (/zero) if the respondent chooses "Higher taxes should be levied on the rich people, even if they benefit little from public services." (/"Higher taxes should be levied on those who benefit more from public services.") The outcome variable for the third panel is a discrete variable, which takes 2 if the progressive taxation is chosen, 1 if the linear taxation is chosen, and 0 if the capitation taxation is chosen in the concrete question for tax progressivity. The outcome variable for the fourth panel is a binary variable coded as one (/zero) if the respondent chooses "The money should be spent exclusively for helping the poor." (/"The money should be spent to benefit everyone in the society.") to the question: "Imagine that the government has an extra funding of a billion dollars. Which of the following comes closest to your view?" Regarding the fifth panel, for each of the four questions about welfare policies, we first create a discrete variable which takes 1 if "increased" was chosen, 0.5 if "remained the same" was chosen, and 0 if "decreased" was chosen. The outcome variable is the average number across four questions.

	(1)	(2)	(3)	(4)	(5)
		Support for tax progressivity :		Support for redistributive spending:	
	Admit a universal tax increase	Abstract question	Concrete question	Extra revenue use	Welfare policies
Treatment	0.1179***	0.0121	-0.0047	-0.0494**	0.0108
	(0.0210)	(0.0175)	(0.0118)	(0.0200)	(0.0113)
Receive	0.3063***	-0.0883***	-0.0854***	0.0714**	0.0431***
	(0.0256)	(0.0260)	(0.0175)	(0.0286)	(0.0147)
Treatment×Receive	-0.0557*	0.0209	-0.0130	0.0370	-0.0201
	(0.0321)	(0.0354)	(0.0236)	(0.0385)	(0.0203)
Female	-0.0398**	0.0090	0.0155	-0.0153	0.0179*
	(0.0166)	(0.0157)	(0.0104)	(0.0175)	(0.0095)
Age	-0.0090**	0.0024	0.0016	-0.0012	-0.0011
	(0.0042)	(0.0039)	(0.0026)	(0.0044)	(0.0024)
Age^2	0.0001**	-0.0000	-0.0000	0.0000	0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Married	0.1409***	-0.0870***	-0.0627***	-0.0067	-0.0389***
	(0.0201)	(0.0173)	(0.0118)	(0.0202)	(0.0109)
Suburban areas	-0.0711***	0.0146	0.0059	-0.0080	-0.0163
	(0.0194)	(0.0178)	(0.0121)	(0.0203)	(0.0108)
Rural areas	-0.0777***	-0.0091	0.0017	0.0079	-0.0274*
	(0.0242)	(0.0235)	(0.0150)	(0.0259)	(0.0141)
Minority	-0.0265	-0.0011	-0.0279**	0.0158	-0.0082
	(0.0185)	(0.0181)	(0.0124)	(0.0210)	(0.0111)
Bachelor or higher	0.0727***	-0.0181	0.0040	-0.0366*	0.0042
	(0.0206)	(0.0172)	(0.0119)	(0.0203)	(0.0111)
Household income:	0.0620**	-0.0179	-0.0217	-0.0017	-0.0243
$25,001 - $50,000	(0.0309)	(0.0249)	(0.0188)	(0.0315)	(0.0164)
Household income:	0.0589*	-0.0322	-0.0253	-0.0072	-0.0541***
$50,001 -$75,000	(0.0316)	(0.0274)	(0.0200)	(0.0334)	(0.0178)
Household income:	0.0371	-0.0708**	-0.0546**	0.0005	-0.0671***
$75,001 $100,000	(0.0334)	(0.0305)	(0.0216)	(0.0357)	(0.0194)
Household income:	0.0341	-0.0165	-0.0398	-0.0539	-0.0628***
$100,001 - $125,000	(0.0396)	(0.0371)	(0.0257)	(0.0420)	(0.0236)
Household income:	0.0049	-0.0702	-0.0380	-0.0881*	-0.0748***
$125,001 - $150,000	(0.0487)	(0.0444)	(0.0295)	(0.0470)	(0.0267)
Household income:	0.0211	-0.0683	-0.0709**	-0.0907*	-0.0573**
More than $150,000	(0.0481)	(0.0417)	(0.0302)	(0.0463)	(0.0280)
Moderately liberal	-0.0965***	-0.0403**	-0.0503***	-0.1316***	-0.1062***
	(0.0219)	(0.0171)	(0.0127)	(0.0242)	(0.0117)
Moderately conservative	-0.3189***	-0.2218***	-0.1557***	-0.3101***	-0.3112***
	(0.0232)	(0.0220)	(0.0149)	(0.0245)	(0.0132)
Conservative	-0.2461***	-0.3201***	-0.1955***	-0.3139***	-0.3066***
	(0.0241)	(0.0272)	(0.0178)	(0.0269)	(0.0163)
Constant	0.6696***	0.8859***	0.8693***	0.6170***	0.8810***
	(0.0964)	(0.0880)	(0.0591)	(0.1008)	(0.0545)
N	2953	2953	2953	2953	2953
R^2	0.212	0.121	0.125	0.085	0.238

Notes: For each row, the coefficient and p-value are from the regressions of the form assigned to $Outcome_i = \alpha + \beta Covariates_i + \epsilon_i$, where $Covariates$ are listed to the left in the row. + Significant at the 10% level. * Significant at the 5% level. ** Significant at the 1% level. *** Significant at the 0.1% level.

Table B.7: Regression results for Figure B.5

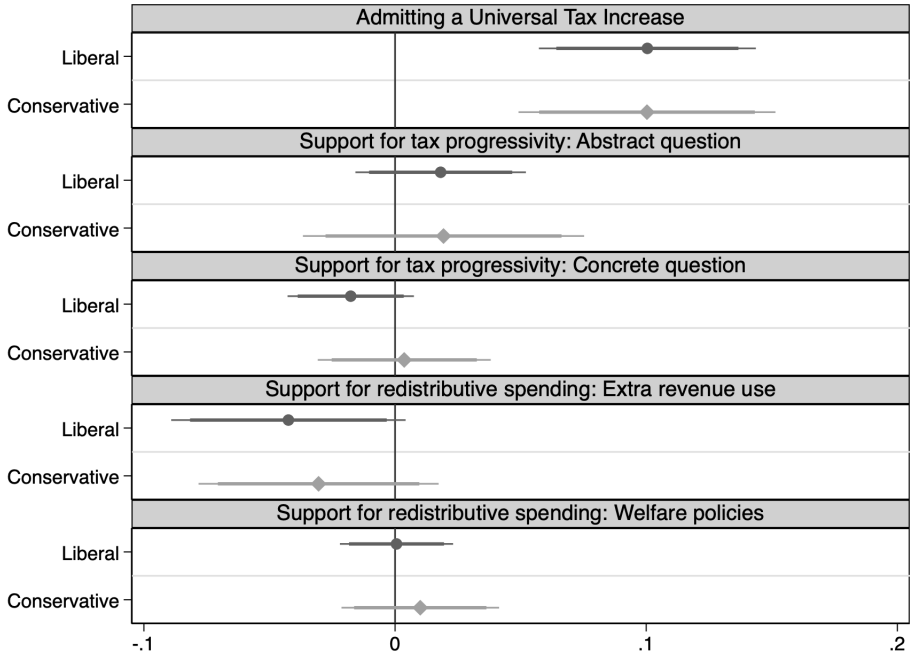


Figure B.6: Heterogeneous treatment effects: potential role of political ideology

Notes: The thin lines are the 95 % confidence intervals and the thick lines are 90% confidence intervals. Each dot is the estimated treatment effect based on the following regression equation $Outcome_i = (Treatment\ terms) + \beta Covariates_i + \epsilon_i$. Equation (B.1) in Online Appendix provides the details of the specification. The outcome variable for the first panel is a binary variable coded as one (/zero) if the respondent chooses "agree (/disagree)" to the question: "Imagine that the government says it needs to increase everyone's tax bill by 1%. Do you agree with this tax increase?" The outcome variable for the second panel is a binary variable coded as one (/zero) if the respondent chooses "Higher taxes should be levied on the rich people, even if they benefit little from public services." (/"Higher taxes should be levied on those who benefit more from public services.") The outcome variable for the third panel is a discrete variable, which takes 2 if the progressive taxation is chosen, 1 if the linear taxation is chosen, and 0 if the capitation taxation is chosen in the concrete question for tax progressivity. The outcome variable for the fourth panel is a binary variable coded as one (/zero) if the respondent chooses "The money should be spent exclusively for helping the poor." (/"The money should be spent to benefit everyone in the society.") to the question: "Imagine that the government has an extra funding of a billion dollars. Which of the following comes closest to your view?" Regarding the fifth panel, for each of the four questions about welfare policies, we first create a discrete variable which takes 1 if "increased" was chosen, 0.5 if "remained the same" was chosen, and 0 if "decreased" was chosen. The outcome variable is the average number across four questions.

	(1)	(2)	(3)	(4)	(5)
		Support for tax progressivity :		Support for redistributive spending:	
	Admit a universal tax increase	Abstract question	Concrete question	Extra revenue use	Welfare policies
Treatment	0.1009***	0.0185	0.0032	-0.0306	0.0099
	(0.0262)	(0.0287)	(0.0176)	(0.0244)	(0.0160)
Liberal	0.2332***	0.2407***	0.1553***	0.2445***	0.2552***
	(0.0239)	(0.0237)	(0.0156)	(0.0244)	(0.0138)
Treatment×Liberal	-0.0037	-0.0015	-0.0225	-0.0162	-0.0129
	(0.0343)	(0.0335)	(0.0218)	(0.0342)	(0.0198)
Female	-0.0397**	0.0097	0.0169	-0.0135	0.0197**
	(0.0172)	(0.0158)	(0.0105)	(0.0176)	(0.0096)
Age	-0.0102**	0.0028	0.0016	-0.0021	-0.0018
	(0.0044)	(0.0039)	(0.0026)	(0.0045)	(0.0024)
Age^2	0.0001**	-0.0000	-0.0000	0.0000	0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Married	0.2195***	-0.1158***	-0.0916***	0.0147	-0.0320***
	(0.0190)	(0.0172)	(0.0117)	(0.0196)	(0.0109)
Suburban areas	-0.1421***	0.0369**	0.0260**	-0.0362*	-0.0303***
	(0.0192)	(0.0175)	(0.0120)	(0.0198)	(0.0107)
Rural areas	-0.1254***	0.0040	0.0132	-0.0131	-0.0389***
	(0.0249)	(0.0235)	(0.0151)	(0.0258)	(0.0142)
Minority	-0.0207	-0.0037	-0.0318**	0.0164	-0.0099
	(0.0195)	(0.0182)	(0.0126)	(0.0210)	(0.0113)
Bachelor or higher	0.1043***	-0.0282	-0.0048	-0.0254	0.0103
	(0.0208)	(0.0173)	(0.0120)	(0.0204)	(0.0113)
Household income:	-0.0014	-0.0065	-0.0084	-0.0322	-0.0405**
$25,001 - $50,000	(0.0302)	(0.0247)	(0.0184)	(0.0316)	(0.0164)
Household income:	-0.0177	-0.0183	-0.0074	-0.0423	-0.0716***
$50,001 -$75,000	(0.0316)	(0.0269)	(0.0197)	(0.0333)	(0.0177)
Household income:	-0.0685**	-0.0454	-0.0276	-0.0426	-0.0888***
$75,001 $100,000	(0.0331)	(0.0299)	(0.0212)	(0.0353)	(0.0193)
Household income:	-0.0643	0.0105	-0.0112	-0.0889**	-0.0791***
$100,001 - $125,000	(0.0407)	(0.0368)	(0.0258)	(0.0421)	(0.0236)
Household income:	-0.1118**	-0.0440	-0.0070	-0.1378***	-0.0983***
$125,001 - $150,000	(0.0489)	(0.0443)	(0.0285)	(0.0466)	(0.0264)
Household income:	-0.1396***	-0.0263	-0.0243	-0.1486***	-0.0835***
More than $150,000	(0.0471)	(0.0413)	(0.0294)	(0.0452)	(0.0276)
Constant	0.5783***	0.5779***	0.6499***	0.3827***	0.6190***
	(0.1006)	(0.0898)	(0.0605)	(0.1019)	(0.0554)
N	2953	2953	2953	2953	2953
R^2	0.147	0.109	0.102	0.069	0.217

Notes: For each row, the coefficient and p-value are from the regressions of the form assigned to $Outcome_i = \alpha + \beta Covariates_i + \epsilon_i$, where $Covariates$ are listed to the left in the row. + Significant at the 10% level. * Significant at the 5% level. ** Significant at the 1% level. *** Significant at the 0.1% level.

Table B.8: Regression results for Figure B.6

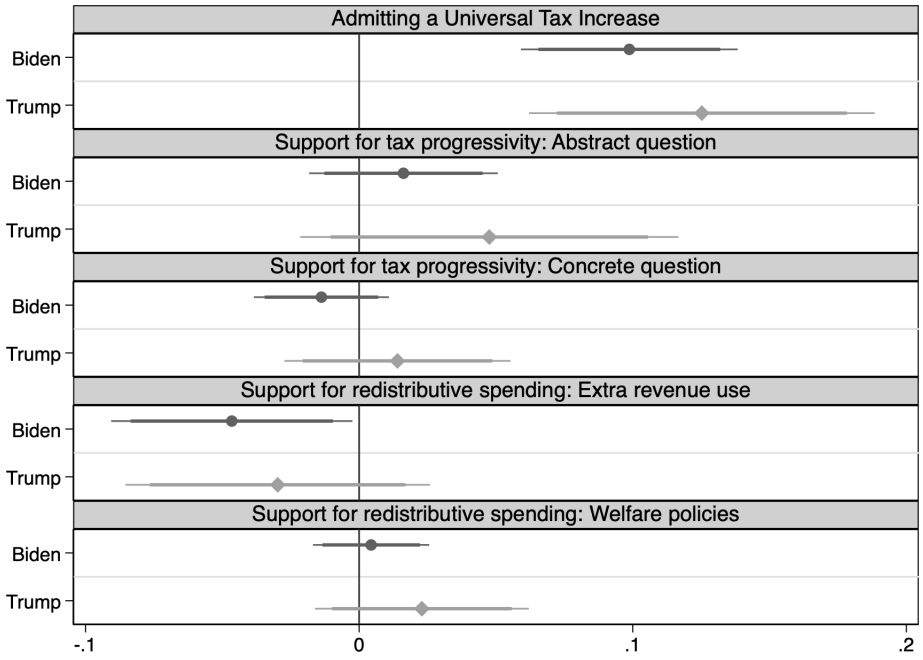


Figure B.7: Heterogeneous treatment effects: potential role of political ideology (voting destination in the 2020 presidential election)

Notes: The thin lines are the 95 % confidence intervals and the thick lines are 90% confidence intervals. Each dot is the estimated treatment effect based on the following regression equation $Outcome_i = (Treatment\ terms) + \beta Covariates_i + \epsilon_i$. Equation (B.1) in Online Appendix provides the details of the specification. The outcome variable for the first panel is a binary variable coded as one (/zero) if the respondent chooses "agree (/disagree)" to the question: "Imagine that the government says it needs to increase everyone's tax bill by 1%. Do you agree with this tax increase?" The outcome variable for the second panel is a binary variable coded as one (/zero) if the respondent chooses "Higher taxes should be levied on the rich people, even if they benefit little from public services." (/"Higher taxes should be levied on those who benefit more from public services.") The outcome variable for the third panel is a discrete variable, which takes 2 if the progressive taxation is chosen, 1 if the linear taxation is chosen, and 0 if the capitation taxation is chosen in the concrete question for tax progressivity. The outcome variable for the fourth panel is a binary variable coded as one (/zero) if the respondent chooses "The money should be spent exclusively for helping the poor." (/"The money should be spent to benefit everyone in the society.") to the question: "Imagine that the government has an extra funding of a billion dollars. Which of the following comes closest to your view?" Regarding the fifth panel, for each of the four questions about welfare policies, we first create a discrete variable which takes 1 if "increased" was chosen, 0.5 if "remained the same" was chosen, and 0 if "decreased" was chosen. The outcome variable is the average number across four questions.

	(1)	(2)	(3)	(4)	(5)
		Support for tax progressivity :		Support for redistributive spending:	
	Admit a universal tax increase	Abstract question	Concrete question	Extra revenue use	Welfare policies
Treatment	0.1252***	0.0476	0.0140	-0.0297	0.0229
	(0.0322)	(0.0352)	(0.0211)	(0.0284)	(0.0199)
Biden-supporters	0.3095***	0.2550***	0.1693***	0.2538***	0.2880***
	(0.0260)	(0.0271)	(0.0171)	(0.0259)	(0.0156)
Treatment×Biden-supporters	-0.0265	-0.0314	-0.0278	-0.0168	-0.0185
	(0.0380)	(0.0393)	(0.0245)	(0.0362)	(0.0227)
Female	-0.0428**	0.0091	0.0180*	-0.0026	0.0215**
	(0.0174)	(0.0164)	(0.0109)	(0.0182)	(0.0098)
Age	-0.0088**	0.0020	0.0016	-0.0021	-0.0001
	(0.0044)	(0.0040)	(0.0027)	(0.0046)	(0.0025)
Age^2	0.0001*	-0.0000	-0.0000	0.0000	-0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Married	0.1934***	-0.1487***	-0.1128***	-0.0174	-0.0691***
	(0.0195)	(0.0173)	(0.0118)	(0.0202)	(0.0110)
Suburban areas	-0.1222***	0.0489***	0.0316**	-0.0277	-0.0149
	(0.0194)	(0.0182)	(0.0125)	(0.0205)	(0.0108)
Rural areas	-0.1083***	0.0153	0.0192	-0.0073	-0.0279*
	(0.0256)	(0.0242)	(0.0155)	(0.0267)	(0.0145)
Minority	-0.0429**	-0.0018	-0.0292**	0.0217	-0.0119
	(0.0197)	(0.0189)	(0.0131)	(0.0217)	(0.0114)
Bachelor or higher	0.0692***	-0.0635***	-0.0299**	-0.0457**	-0.0173
	(0.0218)	(0.0181)	(0.0125)	(0.0216)	(0.0118)
Household income:	0.0154	-0.0125	-0.0054	-0.0379	-0.0495***
$25,001 - $50,000	(0.0314)	(0.0265)	(0.0199)	(0.0337)	(0.0174)
Household income:	-0.0008	-0.0126	0.0078	-0.0359	-0.0698***
$50,001 -$75,000	(0.0327)	(0.0289)	(0.0212)	(0.0355)	(0.0187)
Household income:	-0.0460	-0.0269	-0.0087	-0.0337	-0.0870***
$75,001 $100,000	(0.0340)	(0.0313)	(0.0226)	(0.0374)	(0.0202)
Household income:	-0.0599	0.0098	-0.0005	-0.0947**	-0.0865***
$100,001 - $125,000	(0.0416)	(0.0396)	(0.0268)	(0.0444)	(0.0242)
Household income:	-0.0804*	-0.0303	0.0127	-0.1390***	-0.0921***
$125,001 - $150,000	(0.0486)	(0.0458)	(0.0304)	(0.0492)	(0.0272)
Household income:	-0.1223**	0.0005	0.0042	-0.1327***	-0.0707**
More than $150,000	(0.0494)	(0.0438)	(0.0311)	(0.0477)	(0.0293)
Constant	0.4987***	0.5771***	0.6282***	0.3642***	0.5559***
	(0.1014)	(0.0940)	(0.0628)	(0.1072)	(0.0574)
N	2767	2767	2767	2767	2767
R^2	0.171	0.101	0.103	0.065	0.236

Notes: In this estimation, those who supported neither Biden nor Trump in the 2020 presidential elections are excluded from the data. For each row, the coefficient and p-value are from the regressions of the form assigned to $Outcome_i = \alpha + \beta Covariates_i + \epsilon_i$, where $Covariates$ are listed to the left in the row. + Significant at the 10% level. * Significant at the 5% level. ** Significant at the 1% level. *** Significant at the 0.1% level.

Table B.9: Regression results for Figure B.7

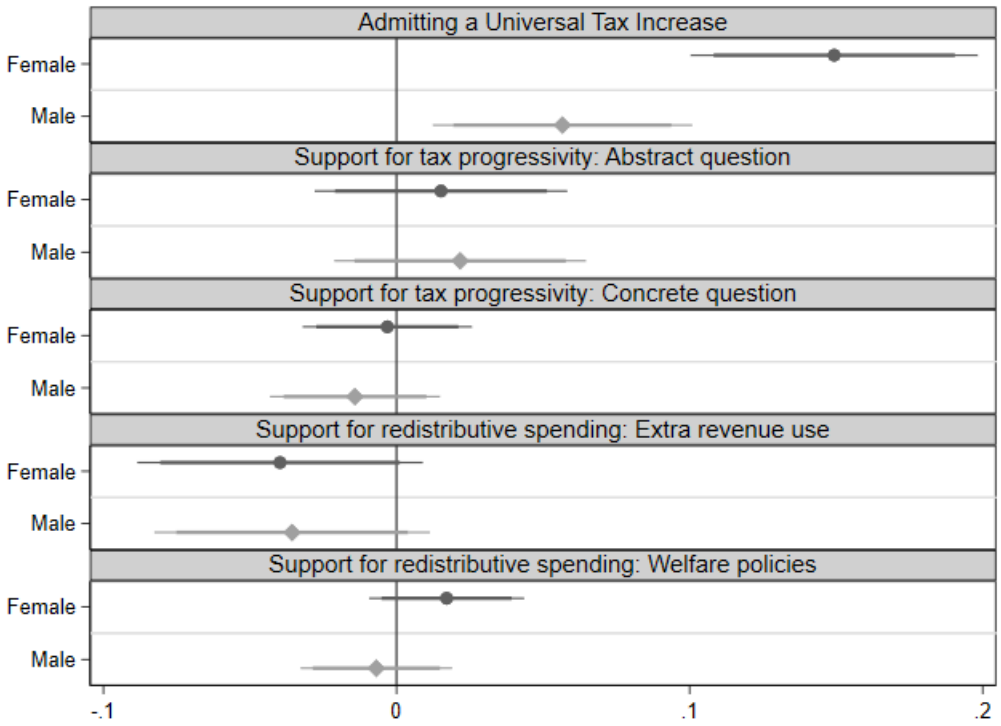


Figure B.8: Heterogeneous treatment effects: potential role of sex

Notes: The thin lines are the 95 % confidence intervals and the thick lines are 90% confidence intervals. Each dot is the estimated treatment effect based on the following regression equation $Outcome_i = (Treatment\ terms) + \beta Covariates_i + \epsilon_i$. Equation (B.1) in Online Appendix provides the details of the specification. The outcome variable for the first panel is a binary variable coded as one (/zero) if the respondent chooses "agree (/disagree)" to the question: "Imagine that the government says it needs to increase everyone's tax bill by 1%. Do you agree with this tax increase?" The outcome variable for the second panel is a binary variable coded as one (/zero) if the respondent chooses "Higher taxes should be levied on the rich people, even if they benefit little from public services." (/"Higher taxes should be levied on those who benefit more from public services.") The outcome variable for the third panel is a discrete variable, which takes 2 if the progressive taxation is chosen, 1 if the linear taxation is chosen, and 0 if the capitation taxation is chosen in the concrete question for tax progressivity. The outcome variable for the fourth panel is a binary variable coded as one (/zero) if the respondent chooses "The money should be spent exclusively for helping the poor." (/"The money should be spent to benefit everyone in the society.") to the question: "Imagine that the government has an extra funding of a billion dollars. Which of the following comes closest to your view?" Regarding the fifth panel, for each of the four questions about welfare policies, we first create a discrete variable which takes 1 if "increased" was chosen, 0.5 if "remained the same" was chosen, and 0 if "decreased" was chosen. The outcome variable is the average number across four questions.

	(1)	(2)	(3)	(4)	(5)
		Support for tax progressivity :		Support for redistributive spending:	
	Admit a universal tax increase	Abstract question	Concrete question	Extra revenue use	Welfare policies
Treatment	0.0566**	0.0217	-0.0142	-0.0356	-0.0069
	(0.0226)	(0.0219)	(0.0148)	(0.0240)	(0.0132)
Female	-0.0880***	0.0129	0.0108	-0.0140	0.0058
	(0.0238)	(0.0221)	(0.0147)	(0.0246)	(0.0132)
Treatment×Female	0.0927***	-0.0065	0.0111	-0.0041	0.0240
	(0.0336)	(0.0310)	(0.0209)	(0.0345)	(0.0189)
Age	-0.0095**	0.0025	0.0016	-0.0013	-0.0013
	(0.0044)	(0.0039)	(0.0026)	(0.0045)	(0.0024)
Age^2	0.0001*	-0.0000	-0.0000	0.0000	0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Married	0.2134***	-0.1073***	-0.0870***	0.0171	-0.0305***
	(0.0191)	(0.0172)	(0.0116)	(0.0196)	(0.0108)
Suburban areas	-0.1264***	0.0299*	0.0248**	-0.0270	-0.0226**
	(0.0192)	(0.0176)	(0.0121)	(0.0199)	(0.0106)
Rural areas	-0.1127***	0.0008	0.0139	-0.0042	-0.0313**
	(0.0249)	(0.0235)	(0.0151)	(0.0259)	(0.0141)
Minority	-0.0191	-0.0034	-0.0315**	0.0196	-0.0078
	(0.0192)	(0.0182)	(0.0125)	(0.0209)	(0.0111)
Bachelor or higher	0.0977***	-0.0251	-0.0040	-0.0290	0.0073
	(0.0207)	(0.0172)	(0.0119)	(0.0203)	(0.0111)
Household income:	0.0101	-0.0028	-0.0028	-0.0202	-0.0298*
$25,001 - $50,000	(0.0303)	(0.0245)	(0.0183)	(0.0314)	(0.0162)
Household income:	-0.0083	-0.0127	-0.0011	-0.0310	-0.0614***
$50,001 -$75,000	(0.0315)	(0.0269)	(0.0196)	(0.0332)	(0.0175)
Household income:	-0.0525	-0.0450	-0.0234	-0.0297	-0.0772***
$75,001 $100,000	(0.0329)	(0.0298)	(0.0210)	(0.0352)	(0.0189)
Household income:	-0.0493	0.0083	-0.0095	-0.0827**	-0.0719***
$100,001 - $125,000	(0.0402)	(0.0369)	(0.0257)	(0.0419)	(0.0232)
Household income:	-0.0975**	-0.0411	-0.0019	-0.1240***	-0.0861***
$125,001 - $150,000	(0.0486)	(0.0440)	(0.0286)	(0.0466)	(0.0264)
Household income:	-0.1261***	-0.0261	-0.0209	-0.1391***	-0.0744***
More than $150,000	(0.0474)	(0.0405)	(0.0290)	(0.0451)	(0.0274)
Moderately liberal	-0.0915***	-0.0417**	-0.0519***	-0.1301***	-0.1056***
	(0.0220)	(0.0173)	(0.0130)	(0.0241)	(0.0116)
Moderately conservative	-0.3280***	-0.2193***	-0.1525***	-0.3132***	-0.3122***
	(0.0240)	(0.0221)	(0.0151)	(0.0245)	(0.0132)
Conservative	-0.2174***	-0.3284***	-0.2048***	-0.3053***	-0.3030***
	(0.0253)	(0.0269)	(0.0176)	(0.0270)	(0.0162)
Constant	0.8551***	0.8397***	0.8253***	0.6593***	0.9089***
	(0.0992)	(0.0882)	(0.0595)	(0.1017)	(0.0547)
N	2953	2953	2953	2953	2953
R^2	0.158	0.116	0.109	0.079	0.236

Notes: For each row, the coefficient and p-value are from the regressions of the form assigned to $Outcome_i = \alpha + \beta Covariates_i + \epsilon_i$, where $Covariates$ are listed to the left in the row. + Significant at the 10% level. * Significant at the 5% level. ** Significant at the 1% level. *** Significant at the 0.1% level.

Table B.10: Regression results for Figure B.8

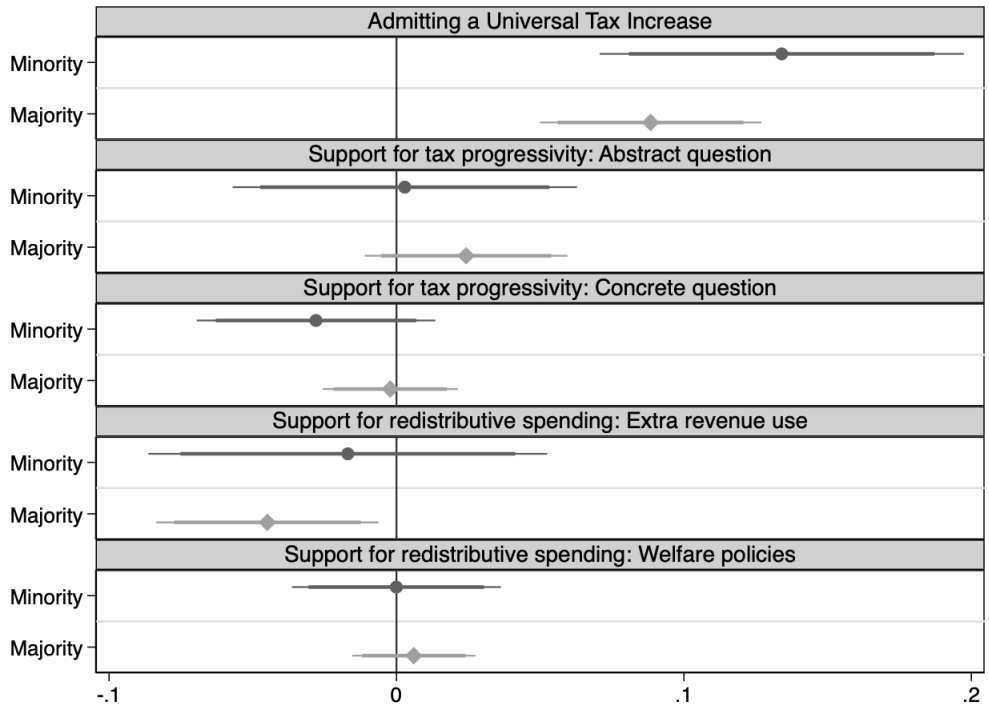


Figure B.9: Heterogeneous treatment effects: potential role of minority status

Notes: The thin lines are the 95 % confidence intervals and the thick lines are 90% confidence intervals. Each dot is the estimated treatment effect based on the following regression equation $Outcome_i = (Treatment\ terms) + \beta Covariates_i + \epsilon_i$. Equation (B.1) in Online Appendix provides the details of the specification. The outcome variable for the first panel is a binary variable coded as one (/zero) if the respondent chooses "agree (/disagree)" to the question: "Imagine that the government says it needs to increase everyone's tax bill by 1%. Do you agree with this tax increase?" The outcome variable for the second panel is a binary variable coded as one (/zero) if the respondent chooses "Higher taxes should be levied on the rich people, even if they benefit little from public services." (/"Higher taxes should be levied on those who benefit more from public services.") The outcome variable for the third panel is a discrete variable, which takes 2 if the progressive taxation is chosen, 1 if the linear taxation is chosen, and 0 if the capitation taxation is chosen in the concrete question for tax progressivity. The outcome variable for the fourth panel is a binary variable coded as one (/zero) if the respondent chooses "The money should be spent exclusively for helping the poor." (/"The money should be spent to benefit everyone in the society.") to the question: "Imagine that the government has an extra funding of a billion dollars. Which of the following comes closest to your view?" Regarding the fifth panel, for each of the four questions about welfare policies, we first create a discrete variable which takes 1 if "increased" was chosen, 0.5 if "remained the same" was chosen, and 0 if "decreased" was chosen. The outcome variable is the average number across four questions.

	(1)	(2)	(3)	(4)	(5)
		Support for tax progressivity :		Support for redistributive spending:	
	Admit a universal tax increase	Abstract question	Concrete question	Extra revenue use	Welfare policies
Treatment	0.0884***	0.0242	-0.0022	-0.0449**	0.0060
	(0.0197)	(0.0180)	(0.0120)	(0.0197)	(0.0109)
Minority	-0.0396	0.0068	-0.0188	0.0060	-0.0044
	(0.0270)	(0.0253)	(0.0169)	(0.0285)	(0.0149)
Treatment×Minority	0.0456	-0.0213	-0.0258	0.0280	-0.0061
	(0.0377)	(0.0354)	(0.0243)	(0.0405)	(0.0215)
Female	-0.0427**	0.0099	0.0166	-0.0164	0.0177*
	(0.0171)	(0.0157)	(0.0105)	(0.0175)	(0.0095)
Age	-0.0089**	0.0024	0.0016	-0.0012	-0.0011
	(0.0044)	(0.0039)	(0.0026)	(0.0045)	(0.0024)
Age^2	0.0001*	-0.0000	-0.0000	0.0000	0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Married	0.2136***	-0.1072***	-0.0867***	0.0168	-0.0303***
	(0.0191)	(0.0172)	(0.0116)	(0.0196)	(0.0108)
Suburban areas	-0.1250***	0.0294*	0.0241**	-0.0263	-0.0227**
	(0.0193)	(0.0176)	(0.0121)	(0.0200)	(0.0106)
Rural areas	-0.1128***	0.0005	0.0134	-0.0038	-0.0315**
	(0.0249)	(0.0235)	(0.0151)	(0.0259)	(0.0141)
Bachelor or higher	0.0982***	-0.0253	-0.0043	-0.0286	0.0072
	(0.0207)	(0.0172)	(0.0119)	(0.0203)	(0.0111)
Household income:	0.0057	-0.0020	-0.0025	-0.0207	-0.0305*
$25,001 - $50,000	(0.0303)	(0.0244)	(0.0183)	(0.0314)	(0.0162)
Household income:	-0.0126	-0.0121	-0.0011	-0.0313	-0.0622***
$50,001 -$75,000	(0.0315)	(0.0268)	(0.0195)	(0.0332)	(0.0175)
Household income:	-0.0575*	-0.0441	-0.0231	-0.0303	-0.0780***
$75,001 $100,000	(0.0330)	(0.0297)	(0.0210)	(0.0352)	(0.0190)
Household income:	-0.0575	0.0094	-0.0096	-0.0832**	-0.0736***
$100,001 - $125,000	(0.0404)	(0.0367)	(0.0256)	(0.0419)	(0.0232)
Household income:	-0.1017**	-0.0404	-0.0016	-0.1246***	-0.0868***
$125,001 - $150,000	(0.0489)	(0.0440)	(0.0286)	(0.0466)	(0.0265)
Household income:	-0.1313***	-0.0254	-0.0209	-0.1394***	-0.0754***
More than $150,000	(0.0474)	(0.0404)	(0.0290)	(0.0451)	(0.0274)
Moderately liberal	-0.0917***	-0.0416**	-0.0519***	-0.1301***	-0.1056***
	(0.0221)	(0.0173)	(0.0130)	(0.0241)	(0.0116)
Moderately conservative	-0.3273***	-0.2197***	-0.1531***	-0.3126***	-0.3124***
	(0.0240)	(0.0221)	(0.0150)	(0.0246)	(0.0132)
Conservative	-0.2158***	-0.3288***	-0.2051***	-0.3049***	-0.3029***
	(0.0253)	(0.0269)	(0.0176)	(0.0270)	(0.0162)
Constant	0.8295***	0.8398***	0.8192***	0.6634***	0.9005***
	(0.0992)	(0.0879)	(0.0591)	(0.1008)	(0.0543)
N	2953	2953	2953	2953	2953
R^2	0.157	0.116	0.109	0.079	0.236

Notes: For each row, the coefficient and p-value are from the regressions of the form assigned to $Outcome_i = \alpha + \beta Covariates_i + \epsilon_i$, where $Covariates$ are listed to the left in the row. + Significant at the 10% level. * Significant at the 5% level. ** Significant at the 1% level. *** Significant at the 0.1% level.

Table B.11: Regression results for Figure B.9

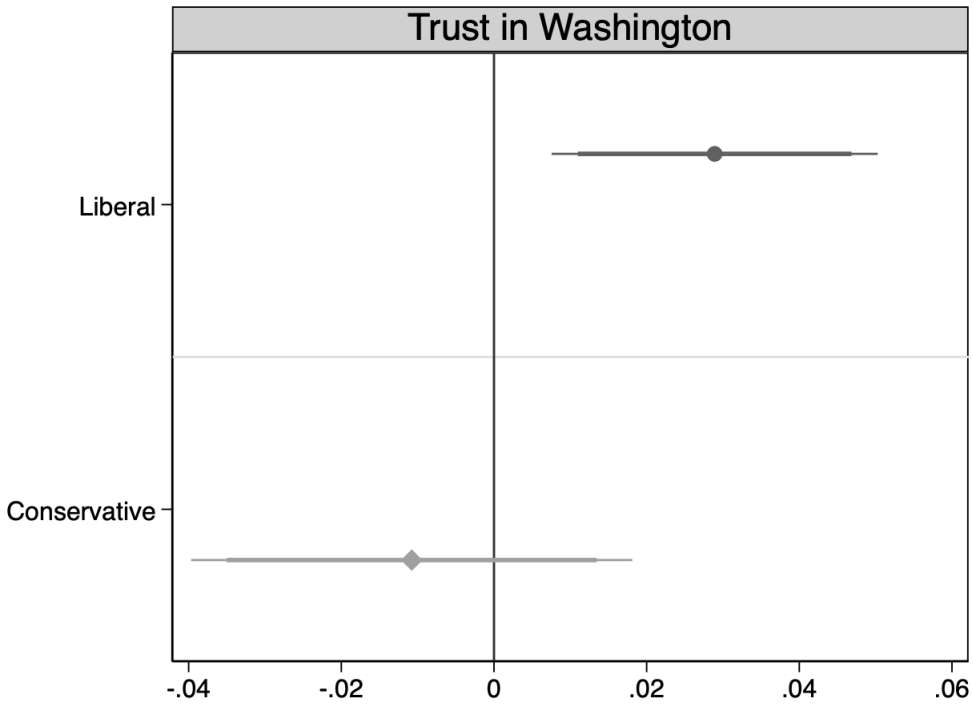


Figure B.10: The treatment effect on political trust

Notes: The thin lines are the 95 % confidence intervals and the thick lines are 90% confidence intervals. The thin lines are the 95 % confidence intervals and the thick lines are 90% confidence intervals. Each dot is the estimated treatment effect based on the following regression equation $Outcome_i = (Treatment) + \beta Covariates_i + \epsilon_i$. Equation (1) provides the details of the specification. The outcome variable is a discrete variable that takes 1 if the respondent chooses "much of the time", 2/3 if the respondent chooses "just about always", 1/3 if the respondent chooses "only some of the time", and 0 if the respondent chooses "hardly ever".

	(1)	
	Trust in Washington	
Treatment	-0.0108	(0.0147)
Liberal	0.0486***	(0.0128)
Treatment×Liberal	0.0397**	(0.0183)
Female	-0.0034	(0.0089)
Age	-0.0023	(0.0023)
Age^2	0.0000	(0.0000)
Married	0.1452***	(0.0097)
Suburban areas	-0.1074***	(0.0100)
Rural areas	-0.1133***	(0.0140)
Minority	0.0386***	(0.0102)
Bachelor or higher	0.1009***	(0.0106)
Household income: $25,001 - $50,000	0.0005	(0.0164)
Household income: $50,001 -$75,000	-0.0118	(0.0171)
Household income: $75,001 $100,000	-0.0130	(0.0182)
Household income: $100,001 - $125,000	-0.0159	(0.0211)
Household income: $125,001 - $150,000	-0.0532**	(0.0256)
Household income: More than $150,000	-0.0920***	(0.0244)
Constant	0.3749***	(0.0528)
N	2953	
R^2	0.205	

Notes: For each row, the coefficient and p-value are from the regressions of the form assigned to $Outcome_i = \alpha + \beta Covariates_i + \epsilon_i$, where $Covariates$ are listed to the left in the row. + Significant at the 10% level. * Significant at the 5% level. ** Significant at the 1% level. *** Significant at the 0.1% level.

Table B.12: Regression results for Figure B.10

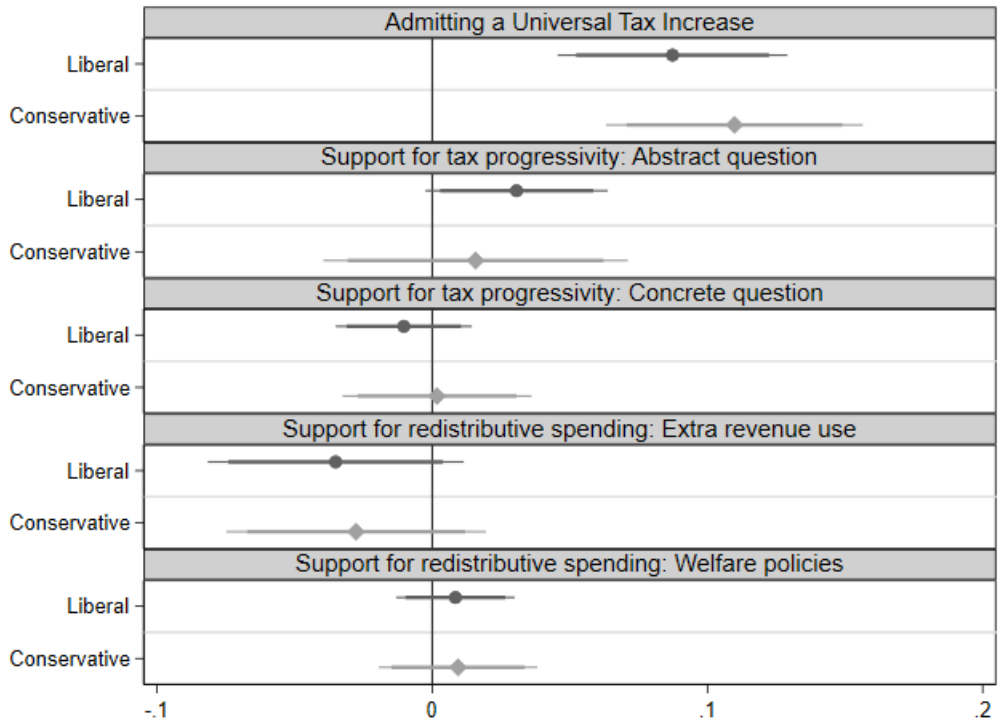


Figure B.11: Treatment effects controlling for trust in government

Notes: The thin lines are the 95 % confidence intervals and the thick lines are 90% confidence intervals. Each dot is the estimated treatment effect based on the following regression equation $Outcome_i = (Treatment\ terms) + \beta Covariates_i + \epsilon_i$. Equation (B.1) in Online Appendix provides the details of the specification. In this specification, we control for trust in Washington by fixed effects, which is measured by answer to the question "How much of the time do you think you can trust the government in Washington to do what is right?" in addition to the control variables throughout the paper. The outcome variable for the first panel is a binary variable coded as one (/zero) if the respondent chooses "agree (/disagree)" to the question: "Imagine that the government says it needs to increase everyone's tax bill by 1%. Do you agree with this tax increase?" The outcome variable for the second panel is a binary variable coded as one (/zero) if the respondent chooses "Higher taxes should be levied on the rich people, even if they benefit little from public services." (/"Higher taxes should be levied on those who benefit more from public services.") The outcome variable for the third panel is a discrete variable, which takes 2 if the progressive taxation is chosen, 1 if the linear taxation is chosen, and 0 if the capitation taxation is chosen in the concrete question for tax progressivity. The outcome variable for the fourth panel is a binary variable coded as one (/zero) if the respondent chooses "The money should be spent exclusively for helping the poor." (/"The money should be spent to benefit everyone in the society.") to the question: "Imagine that the government has an extra funding of a billion dollars. Which of the following comes closest to your view?" Regarding the fifth panel, for each of the four questions about welfare policies, we first create a discrete variable which takes 1 if "increased" was chosen, 0.5 if "remained the same" was chosen, and 0 if "decreased" was chosen. The outcome variable is the average number across four questions.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
			Support for tax progressivity :				Support for redistributive spending:			
	Admit a universal tax increase		Abstract question		Concrete question		Extra revenue use		Welfare policies	
Sample	Liberal	Conservative	Liberal	Conservative	Liberal	Conservative	Liberal	Conservative	Liberal	Conservative
Treatment	0.0873***	0.1098***	0.0306*	0.0157	-0.0103	0.0017	-0.0351	-0.0277	0.0084	0.0094
	(0.0213)	(0.0238)	(0.0169)	(0.0282)	(0.0126)	(0.0175)	(0.0237)	(0.0240)	(0.0110)	(0.0147)
Female	-0.0689***	-0.0084	0.0021	-0.0117	-0.0040	0.0256	-0.0228	-0.0324	-0.0046	0.0184
	(0.0216)	(0.0246)	(0.0172)	(0.0291)	(0.0126)	(0.0180)	(0.0240)	(0.0249)	(0.0110)	(0.0151)
Age	-0.0079	-0.0090	0.0026	0.0036	0.0019	0.0013	-0.0053	0.0047	0.0004	-0.0017
	(0.0054)	(0.0066)	(0.0037)	(0.0075)	(0.0031)	(0.0043)	(0.0062)	(0.0061)	(0.0028)	(0.0036)
Age^2	0.0001*	0.0001	0.0000	-0.0000	0.0000	-0.0000	0.0001	-0.0001	0.0000	-0.0000
	(0.0001)	(0.0001)	(0.0000)	(0.0001)	(0.0000)	(0.0000)	(0.0001)	(0.0001)	(0.0000)	(0.0000)
Married	0.1146***	0.1532***	-0.1174***	-0.0401	-0.0811***	-0.0537**	0.0020	0.0739**	-0.0656***	0.0149
	(0.0246)	(0.0302)	(0.0185)	(0.0339)	(0.0141)	(0.0212)	(0.0273)	(0.0291)	(0.0129)	(0.0182)
Suburban areas	-0.0507**	-0.0912***	0.0541***	-0.0334	0.0325**	-0.0130	-0.0143	-0.0579*	0.0323***	-0.0897***
	(0.0240)	(0.0295)	(0.0191)	(0.0347)	(0.0143)	(0.0220)	(0.0269)	(0.0295)	(0.0122)	(0.0179)
Rural areas	-0.0174	-0.0783**	0.0189	-0.0285	0.0086	0.0042	-0.0003	-0.0121	0.0156	-0.0616***
	(0.0325)	(0.0351)	(0.0263)	(0.0415)	(0.0188)	(0.0247)	(0.0372)	(0.0362)	(0.0167)	(0.0224)
Minority	-0.0780***	0.0345	-0.0146	0.0122	-0.0335**	-0.0224	-0.0070	0.0653*	-0.0202	0.0025
	(0.0237)	(0.0288)	(0.0198)	(0.0357)	(0.0148)	(0.0227)	(0.0268)	(0.0334)	(0.0126)	(0.0197)
Bachelor or higher	-0.0158	0.1049***	-0.0359**	-0.0149	-0.0024	0.0006	-0.0708**	0.0149	-0.0210	0.0090
	(0.0265)	(0.0296)	(0.0173)	(0.0343)	(0.0142)	(0.0211)	(0.0288)	(0.0278)	(0.0134)	(0.0179)
Household income:	-0.0091	0.0572	0.0171	-0.0329	-0.0039	-0.0005	-0.0278	0.0021	-0.0357**	-0.0062
$25,001 - $50,000	(0.0378)	(0.0466)	(0.0238)	(0.0538)	(0.0209)	(0.0363)	(0.0400)	(0.0485)	(0.0177)	(0.0300)
Household income:	-0.0030	0.0227	-0.0180	-0.0079	-0.0190	0.0249	-0.0063	-0.0588	-0.0728***	-0.0257
$50,001 -$75,000	(0.0398)	(0.0467)	(0.0273)	(0.0563)	(0.0223)	(0.0382)	(0.0430)	(0.0507)	(0.0195)	(0.0314)
Household income:	-0.0160	-0.0541	-0.0204	-0.0607	-0.0245	-0.0141	0.0027	-0.0502	-0.0469**	-0.0810**
$75,001 $100,000	(0.0417)	(0.0475)	(0.0312)	(0.0598)	(0.0248)	(0.0388)	(0.0464)	(0.0524)	(0.0212)	(0.0328)
Household income:	-0.0023	-0.0689	0.0432	-0.0554	-0.0311	0.0081	-0.0231	-0.1522**	-0.0466*	-0.0910**
$100,001 - $125,000	(0.0512)	(0.0597)	(0.0401)	(0.0698)	(0.0302)	(0.0448)	(0.0585)	(0.0611)	(0.0275)	(0.0381)
Household income:	-0.0285	-0.0898	-0.0154	-0.1015	0.0212	-0.0452	-0.0753	-0.1811***	-0.0626*	-0.1032***
$125,001 - $150,000	(0.0604)	(0.0681)	(0.0480)	(0.0806)	(0.0352)	(0.0505)	(0.0677)	(0.0637)	(0.0331)	(0.0400)
Household income:	0.0477	-0.1586**	0.1216***	-0.1889**	0.0159	-0.0710	-0.0937	-0.1905***	0.0585*	-0.1681***
More than $150,000	(0.0648)	(0.0643)	(0.0360)	(0.0738)	(0.0370)	(0.0482)	(0.0712)	(0.0593)	(0.0303)	(0.0404)
Moderately liberal	-0.0913***		-0.0558***		-0.0600***		-0.1382***		-0.1182***	
	(0.0215)		(0.0167)		(0.0129)		(0.0241)		(0.0110)	
Conservative		0.0636**		-0.1259***		-0.0645***		-0.0204		-0.0372**
		(0.0250)		(0.0308)		(0.0187)		(0.0263)		(0.0160)
Trust level: High	-0.0879**	-0.1492***	0.1584***	0.0983	0.0769**	-0.0096	0.0895	0.0465	0.0937***	-0.0627**
	(0.0351)	(0.0360)	(0.0576)	(0.0635)	(0.0377)	(0.0454)	(0.0600)	(0.0571)	(0.0321)	(0.0312)
Trust level: Low	-0.2525***	-0.3976***	0.2633***	0.0967	0.1754***	0.0095	0.1856***	-0.0171	0.1574***	-0.1438***
	(0.0375)	(0.0406)	(0.0569)	(0.0655)	(0.0372)	(0.0460)	(0.0610)	(0.0576)	(0.0325)	(0.0336)
Trust level: Very low	-0.4390***	-0.6099***	0.2836***	-0.0561	0.1557***	-0.0556	0.1904***	-0.0892	0.1464***	-0.2833***
	(0.0495)	(0.0413)	(0.0593)	(0.0688)	(0.0404)	(0.0479)	(0.0685)	(0.0586)	(0.0364)	(0.0362)
Constant	1.0563***	0.8602***	0.5832***	0.6005***	0.6837***	0.6873***	0.6076***	0.2176	0.7260***	0.7813***
	(0.1291)	(0.1515)	(0.1036)	(0.1810)	(0.0812)	(0.1095)	(0.1496)	(0.1525)	(0.0688)	(0.0911)
N	1746	1207	1746	1207	1746	1207	1746	1207	1746	1207
R^2	0.137	0.340	0.124	0.049	0.116	0.035	0.042	0.062	0.156	0.206

Notes: For each row, the coefficient and p-value are from the regressions of the form assigned to $Outcome_i = \alpha + \beta Covariates_i + \epsilon_i$, where $Covariates$ are listed to the left in the row. + Significant at the 10% level. * Significant at the 5% level. ** Significant at the 1% level. *** Significant at the 0.1% level.

Table B.13: Regression results for Figure B.11

C. Supplementary experiment

C.1. Experimental design

The structure of the experiment can be seen in Figure C.1. The public goods experiment is the replication of the main experiment, whereas the welfare experiment is new. Since respondents were randomly assigned to one of these two experiments, we can compare the result of the latter experiment with the former one. Below, we explain the details of the welfare experiment.

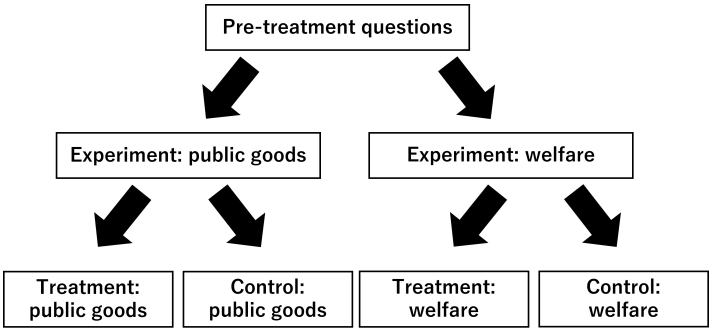


Figure C.1: Experiment design: Supplementary experiment

Treatment of the welfare experiment We assigned respondents randomly to the treatment. The treatment aims to make respondents consider that the US government plays an important role in providing welfare policies that help the poor. The control group did not read any passage. In particular, the respondents assigned to the treatment were asked to read two passages about the role of the US government in providing welfare policies. The first passage is about governmental role in providing food stamps, whereas the second passage is about the EITC (Earned Income Tax Credit). The details can be seen in Figure C.2. To make sure that each respondent carefully reads these passages, each passage is followed by two comprehensive questions. This structure of the treatment is designed to be parallel to that of the main experiment expect a difference in the contents. For example, the length of each passage is similar to that of the main experiment. This enabled us to compare the effect of providing information on welfare policies to that of providing information on public goods.

Manipulation check of the welfare experiment The purpose of the treatment is to make respondents understand the governmental role in welfare policies that help the poor. To ensure that the treatment works as intended, we asked two questions to respondents. The first one is

> How much of your taxes do you think are used for helping the poor?

from 0 % to 100 %. If our treatment works as intended, the respondents who are assigned to the treatment should increase this number. For the treatment group, we asked the same question

Passage 1: The Government has Saved Many Americans by Food Stamps

Foods are obviously essential in our life: we starve to death without them. The US government has saved Americans from starvation by implementing the food stamp program, which is formally called as the Supplementary Nutrition Assistance Program. The food stamp spending was around 60 billion dollars in 2019 and nearly 36 million people received it. Many Americans might have starved without food stamps.

Food stamps are important especially for children. In the aftermath of the great recession, nearly 16 million children, or about one in five, were fed by food stamps. Children cannot focus on studying if they are starving. In a worse case, they lack nutrition required for the healthy growth and suffer for their entire life. Giving foods to the poor households also allows them to afford other essentials for children, such as clothing and tuition for schools. The government has actually spent a lot of your tax money for saving the poor people and their children.

Comprehensive Questions:

Fill in the blank: In 2019, the US government spent about ( ) billion dollars for the food stamps.

Yes or No: Food stamps are especially important for children. One reason is that they might lack essential nutrition required for the healthy growth.

- ○ Yes
- ○ No

Passage 2: The Government has Helped Poor Households with Children by Supplementing Their Income

While raising children may bring pleasures to parents, it actually costs a lot of money. Such cost is particularly tough for poor households. The government has implemented a program, called the Earned Income Tax Credit (EITC), to supplement the income of poor working parents. For households with one child, the maximum annual support is nearly $ 3,500, and for households with multiple children, the number is around $ 6,000. In 2019, the government spent about 70 billion dollars in total for the EITC.

Giving money to low income households may matter for children. It would allow poor households to buy essential goods needed for children. It would also allow parents to devote their time to child-raising. Indeed, a study has shown that when the parents receive the EITC, their children are more likely to attain a higher education level, find a job, and obtain higher earnings when they grow up. The government has spent your tax money to help low income households with children.

Comprehensive Questions:

Yes or No: When parents receives the EITC, their children are more likely to find a job in adulthood.

- ○ Yes
- ○ No

Fill in the blank: In 2019, the US government spent about ( ) billion dollars for the EITC.

Figure C.2: Treatment in the welfare experiment

both before and after the treatment to see how our treatment changed the perceived percentages within the same group.

Another question for the manipulation check is

> Regardless of the income, everyone in the US more or less benefits from public spending.
>
> - Agree
> - Disagree

This is the same as in the main experiment. Since our treatment in the welfare experiment concerns the poor, the treatment should *not* make respondents choose "agree". For such a placebo test, we use the answers to this question.

Main outcomes The main outcomes are the same as those in the main experiment.

C.2. Results

C.2.1. Experiment: Public goods

We start with reporting the results of the public goods experiment, which is the replication of the main experiment.

Figure C.3 shows the results of the manipulation checks. As in the main experiment, our treatment had a substantial impact on the perceived amount of benefits from public goods. With this in mind, we proceeded to the analysis of the main outcomes. The results are reported in Figure C.4. First, the treatment increases support for a larger government by 10%, which is almost the same as the effect size in the main experiment. Second, its negative effects on tax progressivity and spending progressivity are either limited or at least small, relative to the effect on the government size. Figure C.4 suggests that out of four questions on the taxation and spending progressivity, only the support for the progressive tax system in the absract question exhibits the significantly negative treatment effect. In our main experiment, the only question that exhibited the significant treatment effect was the reduced support for targeted spending in an abstract question. Although we find a statistically significant treatment effect for a different question, which might be attributed to factors such as sampling errors and the timing difference of the survey, both the main experiment and the supplementary experiment exhibit only one statistically significant treatment effect out of four outcomes on policy progressivity. Moreover, in both experiments, there is no evidence that the treatment reduces the support for progressive policies in concrete questions. In particular, this might imply that the progressivity of the existing income taxes and spending policies, which already have concrete components, would not be reduced. Taken together, both experiments robustly suggest that our intervention does not have a strong impact on the public opinions regarding policy progressivity.

C.2.2. Experiment: Welfare policies

Next, we report the results of the welfare experiment. Figure C.5 shows the results of the manipulation checks. First, the treatment substantially increased the perceived share of the taxes used for helping the poor. Second, it did not change respondents' view of whether everyone benefits from public spending. Since our treatment is about welfare policies helping the poor, this null effect is as intended. Overall, these results indicate that our treatment worked as intended.

Figure C.6 reports the effects on the main outcomes. First, our treatment increased support for a larger government by 6.3%, whereas it had only a limited effect on tax progressivity. In addition, it increased support for specific welfare policies by 4.5%. See Table C.2 for the regression tables. Note that finding significant treatment effects is consistent with Stantcheva (2021), who shows that informing the details and effectiveness of redistributive policies affects the public opinion.

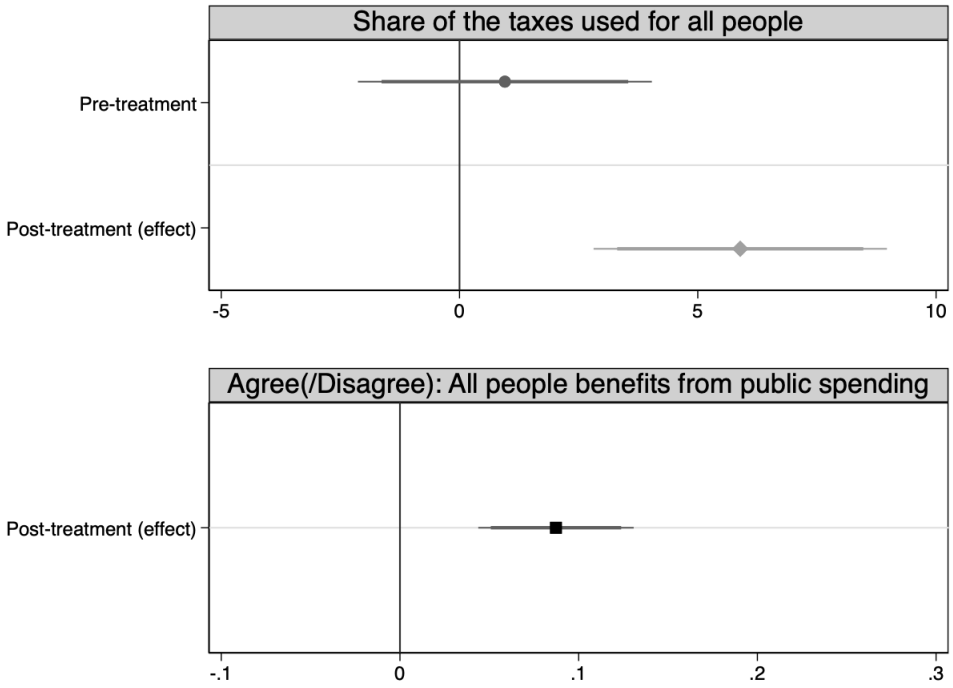
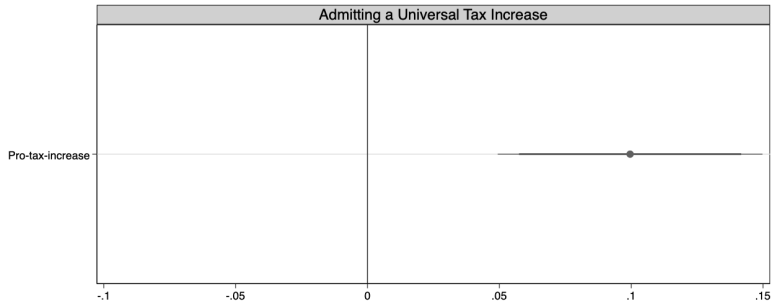
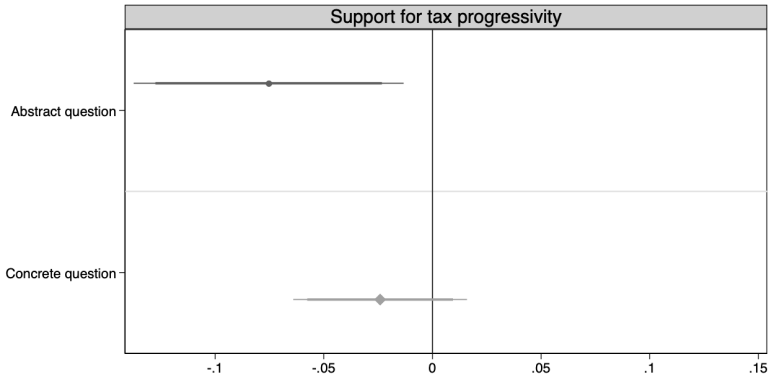


Figure C.3: Supplementary experiment: Manipulation check –Public goods

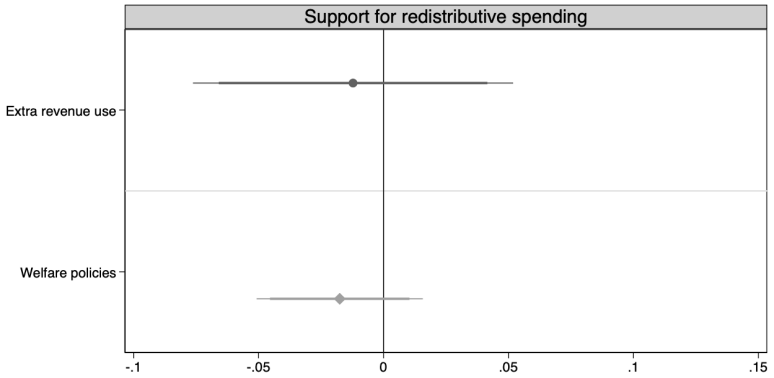
Notes: The thin lines are the 95 % confidence intervals and the thick lines are 90% confidence intervals. Each dot is the estimated treatment effect based on the following regression equation $Outcome_i = (Treatment) + \beta Covariates_i + \epsilon_i$. Equation (1) provides the details of the specification. The outcome variable for the first panel is an answer to the question "How much of your taxes do you think are used for public goods and services that benefit all of you?" This is a continuous variable that takes from 0 to 100. The outcome variable for the lower panel is a binary variable coded as one (/zero) if the respondent chooses "agree (/disagree)" to the question: "Regardless of the income, everyone in the US more or less benefits from public spending."



(a) Preferences for larger government



(b) Preferences for tax progressivity



(c) Preferences for spending progressivity

Figure C.4: Supplementary experiment: Treatment effects –Public goods

Notes: The thin lines are the 95 % confidence intervals and the thick lines are 90% confidence intervals. Each dot is the estimated treatment effect based on the following regression equation $Outcome_i = (Treatment) + \beta Covariates_i + \epsilon_i$. Equation (1) provides the details of the specification. The outcome variable for (a) is a binary variable coded as one (/zero) if the respondent chooses "agree (/disagree)" to the question: "Imagine that the government says it needs to increase everyone's tax bill by 1%. Do you agree with this tax increase?" The outcome variable for the upper panel of (b) is a binary variable coded as one (/zero) if the respondent chooses "Higher taxes should be levied on the rich people, even if they benefit little from public services." (/"Higher taxes should be levied on those who benefit more from public services.") The outcome variable for the lower panel of (b) is a discrete variable, which takes 2 if the progressive taxation is chosen, 1 if the linear taxation is chosen, and 0 if the capitation taxation is chosen in the concrete question for tax progressivity. The outcome variable for the upper panel of (c) is a binary variable coded as one (/zero) if the respondent chooses "The money should be spent exclusively for helping the poor." (/"The money should be spent to benefit everyone in the society.") to the question: "Imagine that the government has an extra funding of a billion dollars. Which of the following comes closest to your view?" Regarding the lower panel of (c), for each of the four questions about welfare policies, we first create a discrete variable which takes 1 if "increased" was chosen, 0.5 if "remained the same" was chosen, and 0 if "decreased" was chosen. The outcome variable is the average number across four questions.

	Manipulation check			Government size	Tax progressivity		Spending progressivity	
	Tax amounts used for all		Perceived benefits	Admitting tax increase	Abstract question	Concrete question	Extra revenue use	Welfare policies
	Before treatment	After treatment						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treatment	0.952	5.891***	0.087***	0.100***	-0.075**	-0.024	-0.012	-0.018
	(1.571)	(1.568)	(0.022)	(0.026)	(0.032)	(0.020)	(0.033)	(0.017)
Female	-2.698*	-2.723*	0.042*	-0.020	0.041	0.011	0.003	0.041**
	(1.627)	(1.626)	(0.024)	(0.028)	(0.032)	(0.021)	(0.033)	(0.017)
Age	-1.065**	-1.379***	-0.011*	-0.004	0.006	0.002	-0.008	-0.003
	(0.454)	(0.447)	(0.006)	(0.008)	(0.009)	(0.005)	(0.009)	(0.005)
Age^2	0.010*	0.013***	0.000**	0.000	-0.000	-0.000	0.000	0.000
	(0.005)	(0.005)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Married	20.035***	16.391***	0.093***	0.283***	-0.152***	-0.081***	-0.005	-0.064**
	(2.127)	(2.092)	(0.034)	(0.040)	(0.039)	(0.026)	(0.043)	(0.025)
Suburban areas	-9.091***	-6.462***	-0.085***	-0.132***	0.091**	0.034	0.008	-0.022
	(1.831)	(1.836)	(0.028)	(0.032)	(0.036)	(0.024)	(0.039)	(0.019)
Rural areas	2.792	2.832	-0.049	-0.068	-0.006	-0.007	-0.082	-0.097***
	(2.759)	(2.756)	(0.039)	(0.043)	(0.052)	(0.034)	(0.050)	(0.029)
Minority	1.736	1.971	0.007	0.036	-0.060	0.007	0.006	-0.026
	(2.062)	(2.054)	(0.029)	(0.033)	(0.041)	(0.027)	(0.042)	(0.024)
Bachelor or higher	7.103***	6.713***	0.068*	0.160***	-0.027	-0.024	-0.053	-0.003
	(2.353)	(2.300)	(0.036)	(0.043)	(0.044)	(0.029)	(0.047)	(0.027)
Household income:	-3.725	-2.672	-0.070	-0.039	0.014	-0.014	-0.008	-0.051
$25,001 - $50,000	(2.957)	(3.207)	(0.049)	(0.058)	(0.062)	(0.041)	(0.067)	(0.037)
Household income:	0.108	2.219	0.009	-0.079	0.028	-0.066	-0.056	-0.031
$50,001 -$75,000	(3.179)	(3.373)	(0.048)	(0.059)	(0.063)	(0.043)	(0.068)	(0.037)
Household income:	1.307	2.017	-0.011	-0.035	0.035	-0.070	0.030	-0.046
$75,001 $100,000	(3.242)	(3.406)	(0.051)	(0.059)	(0.067)	(0.044)	(0.071)	(0.039)
Household income:	1.838	5.795	-0.022	-0.042	0.100	-0.035	-0.076	-0.043
$100,001 - $125,000	(3.851)	(3.870)	(0.058)	(0.068)	(0.080)	(0.054)	(0.082)	(0.049)
Household income:	-1.226	0.241	-0.047	-0.123	0.133	0.018	-0.007	-0.122**
$125,001 - $150,000	(4.495)	(4.543)	(0.063)	(0.075)	(0.086)	(0.058)	(0.091)	(0.054)
Household income:	-16.298***	-11.529**	0.008	-0.216**	0.037	-0.024	-0.050	-0.041
More than $150,000	(4.613)	(4.722)	(0.068)	(0.099)	(0.090)	(0.067)	(0.100)	(0.059)
Moderately liberal	-3.922*	-4.360**	-0.025	-0.120***	-0.001	0.004	-0.047	-0.080***
	(2.069)	(2.117)	(0.029)	(0.036)	(0.041)	(0.027)	(0.045)	(0.023)
Moderately conservative	-5.961***	-6.085***	-0.079**	-0.211***	-0.086*	-0.064**	-0.085*	-0.131***
	(2.197)	(2.206)	(0.032)	(0.036)	(0.044)	(0.028)	(0.046)	(0.024)
Conservative	-0.201	-0.962	-0.074**	-0.132***	-0.111**	-0.069**	-0.091*	-0.139***
	(2.327)	(2.329)	(0.031)	(0.035)	(0.048)	(0.030)	(0.047)	(0.026)
Constant	63.997***	70.635***	0.970***	0.734***	0.645***	0.754***	0.691***	0.839***
	(9.883)	(9.672)	(0.137)	(0.177)	(0.198)	(0.124)	(0.203)	(0.104)
N	911	911	911	911	911	911	911	911
R^2	0.238	0.196	0.078	0.238	0.056	0.057	0.019	0.092

Notes: For each row, the coefficient and p-value are from the regressions of the form assigned to $Outcome_i = \alpha + \beta Covariates_i + \epsilon_i$, where $Covariates$ are listed to the left in the row. + Significant at the 10% level. * Significant at the 5% level. ** Significant at the 1% level. *** Significant at the 0.1% level.

Table C.1: Regression results for Figure C.3 and Figure C.4

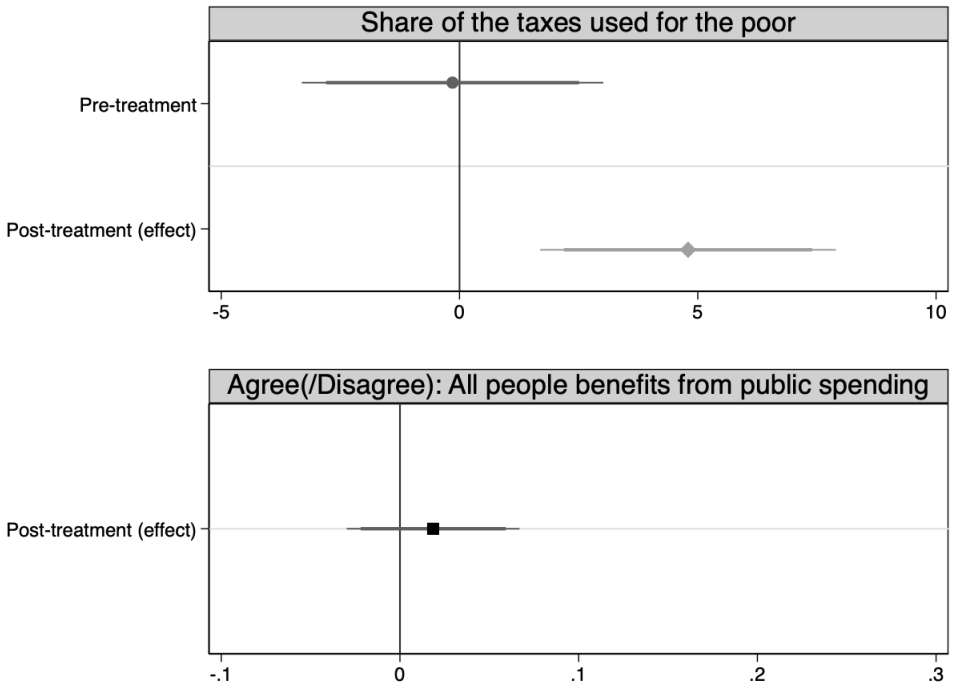
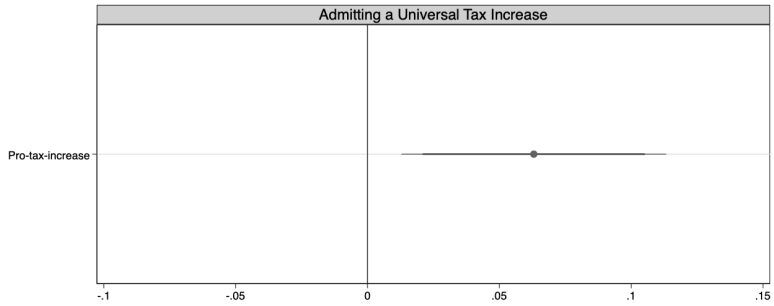
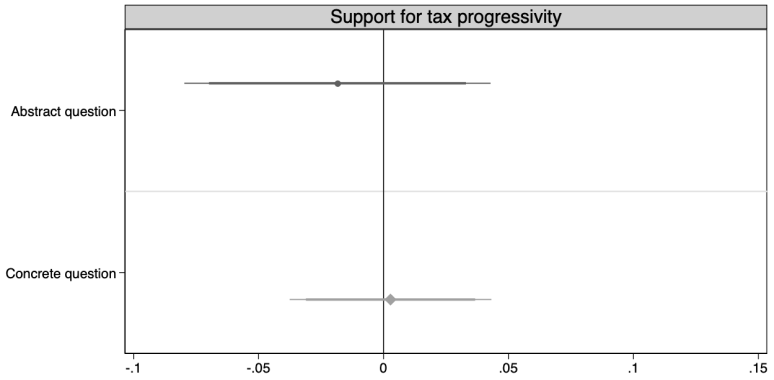


Figure C.5: Supplementary experiment: Manipulation check –Welfare goods

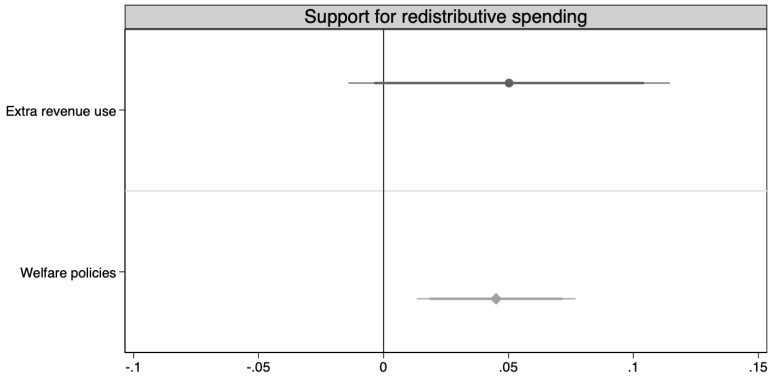
Notes: The thin lines are the 95 % confidence intervals and the thick lines are 90% confidence intervals. Each dot is the estimated treatment effect based on the following regression equation $Outcome_i = (Treatment) + \beta Covariates_i + \epsilon_i$. Equation (1) provides the details of the specification. The outcome variable for the first panel is an answer to the question "How much of your taxes do you think are used for helping the poor?" This is a continuous variable that takes from 0 to 100. The outcome variable for the lower panel is a binary variable coded as one (/zero) if the respondent chooses "agree (/disagree)" to the question: "Regardless of the income, everyone in the US more or less benefits from public spending."



(a) Preferences for larger government



(b) Preferences for tax progressivity



(c) Preferences for spending progressivity

Figure C.6: Supplementary experiment: Treatment effects –Welfare goods

Notes: The thin lines are the 95 % confidence intervals and the thick lines are 90% confidence intervals. Each dot is the estimated treatment effect based on the following regression equation $Outcome_i = (Treatment) + \beta Covariates_i + \epsilon_i$. Equation (1) provides the details of the specification. The outcome variable for (a) is a binary variable coded as one (/zero) if the respondent chooses "agree (/disagree)" to the question: "Imagine that the government says it needs to increase everyone's tax bill by 1%. Do you agree with this tax increase?" The outcome variable for the upper panel of (b) is a binary variable coded as one (/zero) if the respondent chooses "Higher taxes should be levied on the rich people, even if they benefit little from public services." (/"Higher taxes should be levied on those who benefit more from public services.") The outcome variable for the lower panel of (b) is a discrete variable, which takes 2 if the progressive taxation is chosen, 1 if the linear taxation is chosen, and 0 if the capitation taxation is chosen in the concrete question for tax progressivity. The outcome variable for the upper panel of (c) is a binary variable coded as one (/zero) if the respondent chooses "The money should be spent exclusively for helping the poor." (/"The money should be spent to benefit everyone in the society.") to the question: "Imagine that the government has an extra funding of a billion dollars. Which of the following comes closest to your view?" Regarding the lower panel of (c), for each of the four questions about welfare policies, we first create a discrete variable which takes 1 if "increased" was chosen, 0.5 if "remained the same" was chosen, and 0 if "decreased" was chosen. The outcome variable is the average number across four questions.

	Manipulation check			Government size	Tax progressivity		Spending progressivity	
	Tax amounts used for all		Perceived benefits	Admitting tax increase	Abstract question	Concrete question	Extra revenue use	Welfare policies
	Before treatment	After treatment						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treatment	-0.147	4.795***	0.019	0.063**	-0.018	0.003	0.050	0.045***
	(1.612)	(1.581)	(0.025)	(0.026)	(0.031)	(0.021)	(0.033)	(0.016)
Female	-3.478**	-2.333	0.031	0.018	0.073**	0.054***	0.048	0.009
	(1.641)	(1.602)	(0.026)	(0.027)	(0.032)	(0.021)	(0.033)	(0.017)
Age	-0.664	-1.109**	-0.011	-0.014*	0.001	-0.008	-0.006	0.005
	(0.460)	(0.450)	(0.007)	(0.008)	(0.010)	(0.006)	(0.010)	(0.005)
Age^2	0.004	0.009*	0.000	0.000*	-0.000	0.000*	0.000	-0.000
	(0.005)	(0.005)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Married	23.896***	22.194***	0.106***	0.266***	-0.201***	-0.144***	0.043	-0.091***
	(2.068)	(2.069)	(0.038)	(0.042)	(0.038)	(0.027)	(0.045)	(0.022)
Suburban areas	-12.447***	-12.326***	-0.104***	-0.143***	0.087**	-0.004	-0.061	-0.051***
	(1.984)	(1.944)	(0.032)	(0.033)	(0.037)	(0.023)	(0.039)	(0.019)
Rural areas	-5.836**	-7.562***	-0.011	-0.044	0.165***	-0.042	0.049	-0.030
	(2.656)	(2.663)	(0.039)	(0.041)	(0.046)	(0.034)	(0.053)	(0.029)
Minority	1.334	3.053	0.009	-0.008	-0.007	-0.017	-0.008	0.026
	(2.170)	(2.150)	(0.033)	(0.036)	(0.040)	(0.028)	(0.043)	(0.021)
Bachelor or higher	10.164***	9.664***	0.058	0.200***	-0.042	-0.086***	0.008	-0.010
	(2.238)	(2.200)	(0.041)	(0.044)	(0.042)	(0.028)	(0.047)	(0.024)
Household income:	-0.572	0.004	0.032	0.000	0.117**	-0.037	-0.027	-0.051*
$25,001 - $50,000	(2.995)	(2.906)	(0.051)	(0.054)	(0.056)	(0.039)	(0.065)	(0.030)
Household income:	2.599	2.266	0.006	0.024	0.068	-0.040	-0.051	-0.086***
$50,001 -$75,000	(3.171)	(3.061)	(0.052)	(0.055)	(0.059)	(0.039)	(0.067)	(0.032)
Household income:	-0.401	-0.281	-0.004	0.004	0.044	-0.022	-0.074	-0.041
$75,001 $100,000	(3.235)	(3.124)	(0.054)	(0.057)	(0.064)	(0.041)	(0.070)	(0.032)
Household income:	-1.011	-1.576	-0.081	-0.063	0.102	-0.038	-0.126	-0.082*
$100,001 - $125,000	(4.196)	(4.040)	(0.069)	(0.067)	(0.078)	(0.048)	(0.083)	(0.042)
Household income:	2.630	2.760	-0.035	-0.104	0.026	-0.011	-0.195**	-0.188***
$125,001 - $150,000	(4.686)	(4.572)	(0.070)	(0.072)	(0.086)	(0.055)	(0.086)	(0.046)
Household income:	-9.986*	-10.461**	0.010	-0.066	-0.011	-0.049	-0.220**	-0.104*
More than $150,000	(5.188)	(4.814)	(0.085)	(0.090)	(0.102)	(0.074)	(0.103)	(0.053)
Moderately liberal	-3.994*	-4.447**	-0.088***	-0.029	-0.006	0.032	-0.071	-0.074***
	(2.131)	(2.068)	(0.031)	(0.033)	(0.040)	(0.027)	(0.044)	(0.021)
Moderately conservative	-5.140**	-3.611	-0.142***	-0.184***	-0.099**	-0.026	-0.134***	-0.132***
	(2.325)	(2.265)	(0.036)	(0.038)	(0.045)	(0.029)	(0.047)	(0.022)
Conservative	3.612	1.556	-0.098***	-0.094***	-0.098**	-0.038	-0.184***	-0.116***
	(2.403)	(2.376)	(0.032)	(0.035)	(0.047)	(0.032)	(0.048)	(0.024)
Constant	44.707***	55.069***	1.006***	0.776***	0.716***	0.998***	0.714***	0.702***
	(10.052)	(9.763)	(0.156)	(0.172)	(0.201)	(0.124)	(0.210)	(0.115)
N	909	909	909	909	909	909	909	909
R^2	0.320	0.307	0.076	0.223	0.084	0.091	0.047	0.126

Notes: For each row, the coefficient and p-value are from the regressions of the form assigned to $Outcome_i = \alpha + \beta Covariates_i + \epsilon_i$, where $Covariates$ are listed to the left in the row. + Significant at the 10% level. * Significant at the 5% level. ** Significant at the 1% level. *** Significant at the 0.1% level.

Table C.2: Regression results for Figure C.5 and Figure C.6

D. Questionnaire

D.1. Main experiment

You can access our questionnaire at `https://tus.qualtrics.com/jfe/form/SV_0rn30lbFBCzHaVU`.

Pre-treatment questions

1. Our survey concerns with taxes and public spending. The US government national income mainly consists of tax receipts and contributions for government social insurance. In 2019, the US government collected around $5.5 trillion. The GDP in 2019 was around $22 trillion.

   Question. Please choose the correct answer to fill in the blank.

   In 2019, the government collected around ( )% of the GDP.

   Caution: As we would like to ask you to answer this survey seriously, the survey immediately ends without the reward if you do not answer this question correctly.

   - 0
   - 25
   - 50

2. What is your gender?
   - Male
   - Female

3. What is your age?

4. Please indicate your marital status
   - Single
   - Married

5. Do you have children living with you?
   - Yes
   - No

6. How would you describe your ethnicity/race?
   - European American/White
   - African American/Black
   - Hispanic/Latino

- Asian/Asian American
- Other

7. Were you born in the United States?
    - Yes
    - No
8. In which state do you live?
9. Which one of the following best describes the area of your home?
    - Urban
    - Suburban
    - Rural
10. Which category best describes your highest level of education?
    - Eighth Grade or less
    - Some High School
    - High School degree/ GED
    - Some College
    - 2-year College Degree
    - 4-year College Degree
    - Master's Degree
    - Doctoral Degree
    - Professional Degree (JD, MD, MBA)
11. What is your current employment status?
    - Full-time employee
    - Part-time employee
    - Self-employed or small business owner
    - Unemployed and looking for work
    - Student
    - Not in labor force (for example: retired, or full-time parent)
12. What was your TOTAL household income (before taxes and transfers) **last year**?

    Note. The household income includes your income as well as other household members' income.

- $0 - $25,000
- $25,001 - $50,000
- $50,001 -$75,000
- $75,001 $100,000
- $100,001 - $125,000
- $125,001 - $150,000
- More than $150,000

13. Who did you support in the presidential election in 2020? If you were not able to vote, just choose the person you wanted to win the election at that time.
    - Donald Trump
    - Joe Biden
    - Other
14. Are you registered to vote?
    - Yes
    - No
15. Where do you see yourself in the political spectrum?
    - Liberal
    - Moderately liberal
    - Moderately conservative
    - Conservative
16. How much of the time do you think you can trust the government in Washington to do what is right?
    - Just about always
    - Most of the time
    - Only some of the time
    - Hardly ever

Control

1. How much of your taxes do you think are used for public goods and services that benefit all of you?

Treatment

1. How much of your taxes do you think are used for public goods and services that benefit all of you?

2. Now, please closely read the following two passages about how the government spending improves our life. To make sure that you have read it carefully, you are asked to answer the comprehension questions at the end of each passage.

   Passage 1: Our Transportation System is Supported by the Government

   The US government has played an essential role in improving our transportation systems. One of the most important infrastructure, although you might not be aware of in your everyday life, is the roads. The US has more than four million miles of public roads. Construction and maintenance of public roads are impossible without the government's large investment in the transportation infrastructure. In 2017, for example, the US government has spent 177 billion dollars just for highways.

   Of course, roads are not the only infrastructure the US government takes care of. Americans annually make nearly 10 billion trips on public transportation such as buses and trains. The public investment is essential in maintaining our public transportation system. Our airports and other aviation infrastructure are also supported by the public spending. It enriches our life not only by allowing us to make trips but also, for example, by getting

a delivery service when purchasing at an online market. By spending our tax money to improve the transportation system, the government has contributed to making our life better.

Comprehension Questions

- Fill in the blank: The US government spent about ( ) billion dollars for highways in 2017.
- Yes or No: Even a person who does not take a plane may benefit from the US air transportation system supported by the government when, for example, purchasing at an online market.
  - Yes
  - No

3. **Passage 2: The Government has Contributed to Maintaining Our Healthy Life**

Imagine that your community suspends the trash disposal service from today. You would have to take your garbage with you and throw it away in a distant place, or otherwise your community would be contaminated. Imagine also the sewer system at your home has stopped working. You would get into trouble in dealing with dirty water generated in your restroom and kitchen.

The trash disposal and the sewer system are essential in our life and the government has played a fundamental role in maintaining them. This is actually a quite expensive task. Americans generate nearly 300 million tons of solid waste every year and land-filling just one ton of it costs more than 50 dollars. Over the course of 20 years, the US government has spent more than 250 billion dollars for maintaining and improving the sewage system. Whether you may notice or not, the US government has actually spent a lot of your tax money for achieving our healthy life.

Comprehension Questions

- Yes or No: US garbage collection system we use every day is supported by a large spending by the government.

- Yes
- No

- Fill in the blank: Over the 20 years, the US government has spent over ( ) billion dollars for the sewage system.

4. Having read the passage, how much of your taxes do you think are used for public goods and services that benefit all of you?

Post-treatment questions

1. Imagine that the government says it needs to increase everyone's tax bill by 1%. Do you agree with this tax increase?
   - Agree
   - Disagree
2. Agree or Disagree: Regardless of the income, everyone in the US more or less benefits from public spending.
   - Agree
   - Disagree
3. Imagine that the government has an extra funding of a billion dollars. Which of the following comes closest to your view?[30]
   - The money should be spent to benefit everyone in the society.
   - The money should be spent exclusively for helping the poor.
4. Question in Figure 2[31]
5. Please indicate which of the following you think is more important?[32]
   - Higher taxes should be levied on those who benefit more from public services.
   - Higher taxes should be levied on the rich people, even if they benefit little from public services.
6. Should federal spending on welfare programs be decreased, kept the same, or increased?

[30]The order of options is randomly flipped.
[31]The order of options is randomly flipped.
[32]The order of options is randomly flipped.

- Decrease
- Remain the same
- Increase

7. Should federal spending on programs that assist blacks and other minorities be decreased, kept the same, or increased?
    - Decrease
    - Remain the same
    - Increase
8. Should federal spending on programs that assist the homeless be decreased, kept the same, or increased?
    - Decrease
    - Remain the same
    - Increase
9. Should federal spending on food stamps be decreased, kept the same, or increased?
    - Decrease
    - Remain the same
    - Increase
10. Agree or disagree: To ensure that everyone can access to public facilities such as museums, it is a good idea to offer discounts to the low-income people who cannot afford the ticket otherwise.
    - Agree
    - Disagree
11. How much of the time do you think you can trust the government in Washington to do what is right?
    - Just about always
    - Most of the time
    - Only some of the time
    - Hardly ever
12. Do you or any member of your household currently receive food stamps or public assistance income?

- Yes
- No

D.2. Supplementary experiment

You can access our questionnaire at `https://tus.qualtrics.com/jfe/form/SV_cGhOhYpLufdKYUC`

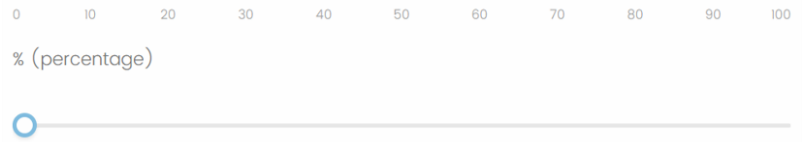
Pre-treatment questions The same as in the main experiment.

Control: Public goods The same as in the main experiment.

Treatment: Public goods The same as in the main experiment.

Control: Welfare policies

1. How much of your taxes do you think are used for helping the poor?



Treatment: Welfare policies

1. How much of your taxes do you think are used for helping the poor?

2. Now, please closely read the following two passages about how the welfare programs help the poor people. To make sure that you have read it carefully, you are asked to answer the comprehension questions at the end of each passage.

3. **The Government has Saved Many Americans by Food Stamps**

Foods are obviously essential in our life: we starve to death without them. The US government has saved Americans from starvation by implementing the food stamp program, which is formally called as the Supplementary Nutrition Assistance Program. The

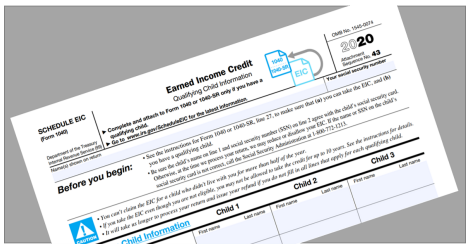
food stamp spending was around 60 billion dollars in 2019 and nearly 36 million people received it. Many Americans might have starved without food stamps.

Food stamps are important especially for children. In the aftermath of the great recession, nearly 16 million children, or about one in five, were fed by food stamps. Children cannot focus on studying if they are starving. In a worse case, they lack nutrition required for the healthy growth and suffer for their entire life. Giving foods to the poor households also allows them to afford other essentials for children, such as clothing and tuition for schools. The government has actually spent a lot of your tax money for saving the poor people and their children.

Comprehension Questions

- Fill in the blank: In 2019, the US government spent about ( ) billion dollars for the food stamps.
- Yes or No: Food stamps are especially important for children. One reason is that they might lack essential nutrition required for the healthy growth.

4. **The Government has Helped Poor Households with Children by Supplementing Their Income**



While raising children may bring pleasures to parents, it actually costs a lot of money. Such cost is particularly tough for poor households. The government has implemented a program, called the Earned Income Tax Credit (EITC), to supplement the income of poor working parents. For households with one child, the maximum annual support is nearly $ 3,500, and for households with multiple children, the number is around $ 6,000. In 2019, the government spent about 70 billion dollars in total for the EITC.

Giving money to low income households may matter for children. It would allow poor households to buy essential goods needed for children. It would also allow parents to devote their time to child-raising. Indeed, a study has shown that when the parents receive the EITC, their children are more likely to attain a higher education level, find a job, and obtain higher earnings whey they grow up. The government has spent your tax money to help low income households with children.

Comprehension Questions

- Yes or No: When parents receives the EITC, their children are more likely to find a job in adulthood.
- Fill in the blank: In 2019, the US government spent about () billion dollars for the EITC.

5. Having read the passage, how much of your taxes do you think are used for helping the poor?

Post-treatment questions The same as in the main experiment