Beliefs about Behavioral Responses to Taxation

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Abstract

We conduct an experiment to study how beliefs about behavioral responses to taxation and preferences over equality–efficiency trade-offs relate to the political disagreement on redistribution. We use a novel method to elicit incentivized beliefs from a sample of 14,700 Americans about how taxes affect people's effort choices, and we elicit incentivized equality–efficiency preferences. We find that Democrats and Republicans have virtually identical beliefs about behavioral responses to taxation. Furthermore, we find that beliefs about behavioral responses to taxation fail to predict people's support for redistribution of income in society. Equality–efficiency preferences, by contrast, strongly predict both people's political affiliation and their support for redistribution of income in society. We also explore the role of motivated beliefs and identity politics by priming respondents about the political disagreement on redistribution. The treatments increase political polarization in preferences and policy views, but do not cause political polarization in beliefs. Overall, our findings suggest that the political divide on redistribution relates more to people's preferences than to their beliefs about the behavioral responses to taxation. (*JEL* C91, D83, H20)

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"Just like economists, voters have conflicting views about redistributive taxation because they estimate its incentive costs differently."

– Thomas Piketty (1995)

1. Introduction

The redistribution of income and wealth is one of the most polarizing topics in politics. In the US, e.g., 80 percent of Democrats think that the government should implement "heavy taxes on the rich," while only 22 percent of Republicans think the same (Newport, 2016). Which factors can account for this striking political polarization in policy views on redistribution? One prominent explanation is that voters have conflicting views about redistribution because they have different beliefs about behavioral responses to taxation (Piketty, 1995). If this explanation is correct, we should expect to see large differences in beliefs about behavioral responses to taxation between Democrats and Republicans.

We test the empirical validity of this explanation by eliciting incentivized beliefs about behavioral responses to taxation from a representative sample of over 10,000 Americans. In this study, we employ a spectator–worker design where spectators estimate how much workers produce in a real-effort task under different payment schemes. We elicit beliefs using a purposefully simple task to obtain quantitative and incentivized estimates of the spectator's beliefs about behavioral responses to taxation. In the experiment, we inform the spectators that we have recruited workers from an online labor market to work on a task for one hour. We tell the spectators that the workers were offered different bonus schemes. In the main treatment, we inform the spectators about how much workers produced under a 20 cents piece rate with no taxes on earnings. We then incentivize the spectators to estimate how much workers produce under a 20 cents piece rate with a 50 percent tax to the US government.

While beliefs about behavioral responses may be an important source of political disagreement about redistribution, people could also differ in their views on redistribution because they have different preferences over equality–efficiency trade-offs (Almås, Cappelen, and Tungodden, 2016; Fisman, Jakiela, and Kariv, 2015). To elicit people's equality–efficiency preferences, we gave the spectators an opportunity to redistribute earnings at a cost between two workers who had been allocated unequal

earnings after completing the same assignment. In this setting, the spectators had identical beliefs about the redistribution cost and had to make a trade-off between implementing equality and efficiency.

The paper offers two main findings, which are summarized in Figure 1. First, in contrast to predictions from prominent political economy models of redistribution (Piketty, 1995), we find no systematic differences between Republicans and Democrats in their beliefs about behavioral responses to taxation. Second, we find large political differences in equality–efficiency preferences: e.g., Republicans are 15.7 percentage points less likely than Democrats to redistribute earnings from the lucky to the unlucky worker.

We furthermore use our incentivized measures of beliefs and preferences to explore whether preferences or beliefs are more strongly related to people's views on redistributive policies. We find that while beliefs about behavioral responses fail to predict people's views on whether society should aim to equalize incomes, equality–efficiency preferences strongly predict people's attitudes on this question. This suggests that people's policy views on redistribution are primarily driven by differences in preferences and not by beliefs.

Over two experiments, we introduce several treatments to explore mechanisms and test for robustness. In the first experiment, we find that people's beliefs are not in line with the standard model in economics according to which workers only care about their personal incentives. For instance, Democrats and Republicans alike believe that taxes paid to the US government are more detrimental to worker production than paying workers a lower wage with the same personal incentives for the workers. In the second experiment, we replicate the main results from the first experiment and further explore the role of motivated beliefs and group identity by priming the respondents about the political debate on taxation or party views on behavioral responses to taxation. We find that the priming treatments do not lead to political polarization in beliefs, but they do increase political polarization in equality–efficiency preferences and support for redistributive taxation. These findings suggest an important role for motivated reasoning and identity politics in the debate on whether to increase income taxes to reduce inequality.

By investigating the roles of beliefs about behavioral responses to taxation and equality–efficiency preferences in forming attitudes towards redistribution, our results contribute to a rich literature on the determinants of people's redistributive

preferences (Alesina and Angeletos, 2005; Bénabou and Ok, 2001; Bénabou and Tirole, 2006; Kuziemko, Norton, Saez, and Stantcheva, 2015; Meltzer and Richard, 1981; Persson and Tabellini, 2000; Piketty, 1995). In particular, we relate to studies showing that people's fairness preferences may be instrumental in forming their views on redistributive policies (Alesina and Angeletos, 2005; Almås et al., 2016; Bénabou and Tirole, 2006; Di Tella, Dubra, and Lagomarsino, 2017). More broadly, our results relate to the literature on social preferences and what motivates effort (Almås et al., 2016; Bolton and Ockenfels, 2000; Charness and Rabin, 2002; DellaVigna and Pope, 2016a,b; Fehr and Schmidt, 1999; Fisman et al., 2015; Kessler and Norton, 2016) and the public finance literature on optimal tax policy and behavioral responses to taxation (Diamond and Saez, 2011; Mankiw, Weinzierl, and Yagan, 2009; Piketty, Saez, and Stantcheva, 2014).

This paper proceeds as follows: Section 2 describes the design and sample for the first experiment. Section 3 presents the theoretical frameworks to guide interpretation of the results. Section 4 outlines the empirical strategy for the first experiment. Section 5 reports the results from the first experiment. Section 6 describes the design and report results from the second experiment. Finally, Section 7 concludes.

2. First experiment: Design and participants

In the first experiment, we collected data for two types of participants: *workers* and *spectators*. We were primarily interested in the spectators, but we also recruited the workers to incentivize the elicitation of beliefs and preferences. Three parts of the experiment focused on eliciting spectators' (i) beliefs about behavioral responses to taxation, (ii) equality–efficiency preferences, and (iii) policy views on redistribution. To elicit their beliefs about behavioral responses to taxation, we first ask the spectators to estimate how much the workers produced under different incentive schemes. To elicit their equality–efficiency preferences, we let the spectators decide whether to redistribute earnings between a pair of workers or not. Finally, to elicit their views on redistribution, we ask the spectators whether they think society should aim to equalize incomes.

2.1. The workers

We recruited 1616 workers from the online labor market Amazon Mechanical Turk (MTurk). We chose to recruit actual workers for three main reasons. First, the design allows us to introduce treatment variations to explore the mechanism. In our experiment, we had four worker groups who were given different incentives during the real-effort task. Second, the design allows us to give the spectators full information about the economic environment. By fixing the economic environment and measuring beliefs on a quantitative scale, beliefs are easily comparable across respondents and have the same interpretation for everyone. Third, recruiting actual workers is a transparent way of incentivizing the spectators' beliefs. Incentivizing beliefs was particularly important for our purposes as monetary incentives have been shown to strongly reduce biases in reported beliefs about economic and political facts (Bullock, Gerber, Hill, and Huber, 2015).

We paid the workers a $2 participation fee and they could work on a real-effort task for up to one hour. The real-effort task consisted of checking off even numbers in large matrices of random numbers. There were 30 matrices in total, and the workers could spend up to two minutes on each matrix.[1] After each matrix, the workers got a summary screen that summarized how many points they had produced and their bonus so far. In a between-subject design, we offer the workers four different incentive schemes:

- *High incentives:* The workers earn a bonus of 20 cents for every 100 points produced.
- *High incentives with government tax:* The workers earn a bonus of 20 cents for every points produced, but have to pay a tax of 50 percent on earnings. Taxes are transferred to the U.S. federal government for general use.
- *Low incentives:* The workers earn a bonus of 10 cents for every 100 points produced.
- *High incentives with redistributive tax:* The workers earn a bonus of 20 cents for every points produced, but have to pay a tax of 50 percent on earnings. Taxes are redistributed back to the workers as as a lump-sum payment.

[1] Figure A.7 shows an example matrix.

To be able to elicit incentivized equality–efficiency preferences from the spectators, we recruited additional 2100 workers on MTurk to answer a 10-minute opinion survey. After having finished the survey, these workers were informed that they had been matched in pairs and that their pay would be determined by a lottery in which the winner would earn $7 and the loser would earn $1.

2.2. The spectators

We recruited 4,217 spectators using Research Now, which is one of the leading digital data collection agencies in the US. We recruited the spectators from Research Now's *Political Panel*, which has two especially attractive features.[2] First, data on people's political affiliations is provided directly by L2, which is one of the largest voting tracking companies in the US. The data on political affiliation is therefore partly based on the spectators' real voting behavior.[3] Second, we did not have to ask people about their political affiliations in the experiment. We believe this mitigates any concerns about priming and experimenter demand.

Column 1 in Table 1 provides the summary statistics for the spectators. Since we wanted to focus on political differences, we only recruited Republicans and Democrats to participate in this study. The samples of both Republicans and Democrats were selected to match the general US population in terms of gender, age, income, race, and geography (as shown in columns 2 and 3).

2.3. Eliciting beliefs about behavioral responses to taxation

In all treatments, the spectators are first told that they will be asked how much they think others performed on a task and that they may earn a $10 bonus if their answer is sufficiently close to how others actually performed on the task. We then give the spectators the opportunity to spend up to two minutes on the task to gain familiarity with it.[4] After the spectators have tried out the task themselves, we inform them

[2]Extensive information about the panel is available on the following web page: `https://www.researchnow.com/products-services/global-audiences-and-panel/political-panel/`.

[3]More information about L2 and their voter file is available on their web page, `http://www.l2political.com/`.

[4]To participate in their surveys, Research Now pays respondents in points that can be converted into "e-Rewards." While we paid Research Now $10 for correct estimates, the respondents actually received points equal to $10 in this panel currency. The points can be spent on retail vouchers that

that two groups of workers from an online labor market have worked on the task for one hour and that these workers were offered different bonus schemes: i.e., *Bonus A* and *Bonus B*. In the main treatment, we inform the spectators that workers offered Bonus A earned a 20 cents piece rate, whereas workers offered Bonus B earned a 20 cents piece rate with a 50 percent tax to the US government. All spectators are then informed about how much workers offered Bonus A produced (3032 points on average). To fix beliefs about the distribution of effort among workers offered Bonus A, we also show the spectators a histogram of the distribution of the production by workers in this group. Finally, to elicit beliefs about how different incentives affect effort choices, we ask the spectators to estimate how many points individuals offered Bonus B produced on average. To incentivize their answers, we furthermore inform them that they will receive a $10 bonus if their answer is within +/- 5 percent of the actual production for individuals offered Bonus B.

In sum, in contrast to traditional survey questions, our belief measure i) fixes the economic environment, ii) allows the spectators to gain familiarity with the economic environment, iii) gives the spectators full information about the distribution of effort when earnings are not taxed, and iv) allows us to provide incentives for accuracy. Furthermore, by recruiting actual workers, we are able to introduce treatment variations to explore mechanisms.

In the main treatment, we inform the spectators that workers offered Bonus B earned a 20 cents piece rate with a 50 percent tax to the US government. When estimating how workers respond to a government tax, spectators could differ in their beliefs about two factors: i.e., i) how costly it is for the workers to provide effort and ii) how motivated by social incentives the workers are. To differentiate between these two factors, we add a second treatment where we describe Bonus B as a 10 cents piece rate (instead of a 20 cents piece rate with a 50 percent tax). Since the workers face the same personal incentives as in the base treatment, the standard model in economics—according to which workers only care about their personal incentives—predicts that beliefs about production in these two treatments should be identical. The second treatment tests whether beliefs are in line with the standard model in economics by isolating the importance of beliefs about social incentives. Finally, to assess robustness, we add a third treatment to test whether any motivation to pay taxes depend on the recipient of the tax revenue. In this treatment, we describe

the respondents preselected, e.g., on Amazon, when they reach a certain number of points.

a bonus as a 20 cents piece rate with a 50 percent tax that is redistributed back to workers as a lump-sum payment. This treatment allows us to assess whether beliefs about the social motivation to pay taxes depend on the recipient of the tax revenue. We can summarize the three spectator treatments as follows:

- **Government Tax:** Spectators are informed about the production of workers offered *high incentives* and state their beliefs about the production of workers offered *high incentives with government tax*.
- **Low Pay:** Spectators are informed about the production of workers offered *high incentives* and state their beliefs about the production of workers offered *low incentives*.
- **Redistributive Tax:** Spectators are informed about the production of workers offered *high incentives* and state their beliefs about the production of workers offered *high incentives with redistributive tax*.

2.4. Equality–efficiency preferences

In the second part of the experiment, we introduced a real redistributive setting to measure people's equality efficiency preferences. Specifically, we told the spectators that they had been given the opportunity to redistribute earnings between two other workers that had completed an identical assignment and had their earnings determined by a lottery. The spectators were informed that the worker winning the lottery had earned $7 and the worker losing the lottery had earned $1. We also told the spectators that the workers did not know the outcome of the lottery, but that they had been informed that a third person would be given the opportunity to redistribute their earnings. Finally, we introduced a redistribution cost: i.e., each dollar redistributed from the lucky worker to the unlucky worker would reduce the payments to the lucky worker by $2. Thus, the spectators could choose between keeping the unequal income distribution (7:1) or implement any of the following income distributions: (5:2), (3:3), or (1:4). We informed the spectators that their decisions would be implemented with a one in ten chance.

This redistributive setting has two key features. First, by fixing the redistribution cost, we eliminated the role of differences in beliefs from the redistributive decisions.

Second, by making redistribution costly, we created a real trade-off between implementing equality and efficiency: i.e., the spectators could implement equality by choosing the equal distribution (3:3) or maximize the total earnings by choosing the most unequal option (7:1).

2.5. Views on redistribution

In the third and final part of the experiment, we elicited the spectators' views on redistribution by asking them the following question: *Where would you rate yourself on a scale from 1 to 10, where 1 means: "I think a society should aim to equalize incomes" and 10 means: "I think a society should* ***not*** *aim to equalize incomes."*

3. Theory

To guide the interpretation of the results presented in the next section, we first present two simple frameworks that motivated our design choices in the elicitation of beliefs and preferences.

3.1. Beliefs about behavioral responses to taxation

We assume that the spectators consider two factors when estimating behavioral responses to taxation: (i) how costly they think it is for workers to provide effort and (ii) how much they think the workers value a dollar paid in taxes. The first factor follows from the *standard model in economics*, according to which workers only care about their personal incentives after taxes. The second factor is more behavioral: i.e., the spectators may believe that the workers are motivated by social incentives and thus place some weight on the welfare of the tax recipient.[5] Formally, in our model of how the spectators form their expectations, we assume the spectators envision that workers maximize utility given by:

$$U(e;\cdot) = we[(1-\tau)+\gamma\tau] - c(e) \tag{1}$$

[5]There is mixed evidence on whether taxes discourage or motivate workers. A recent study by Rick, Paolacci, and Burson (2018) find that taxes motivate people who favor redistribution and government intervention to work harder. By contrast, Kessler and Norton (2016) find that workers provide less effort when they are taxed compared to when their wages are cut by the same amount as the tax.

where w is the piece-rate wage, e is points produced (effort), τ is the tax rate, γ is the weight on taxed income, and $c(e)$ is a convex cost-of-effort function that satisfies the usual conditions. Utility is linear in money (i.e., we abstract from income effects). The first-order condition for this problem is given by:

$$e^* = c'^{-1}\left(w[(1-\tau)+\gamma\tau]\right) \tag{2}$$

Thus, the spectators can have different beliefs about workers' cost of providing effort, $c(e)$, and the workers' social preferences towards the tax recipient, γ. The treatment difference between Government Tax and Low Pay allows us to identify whether spectators think $\gamma = 0$ as the standard model in economics predicts. Furthermore, the treatment difference between government and redistributive taxes allows us to identify whether beliefs about γ depend on whether the tax revenues benefit the government or other workers. We will later assume that $c(e)$ in Equation (2) is quadratic (i.e., on the form ae^2, where a is a constant) to derive structural estimates of how much the spectators believe the workers would be willing to give up to increase tax revenues by \$1.

3.2. Equality–efficiency preferences

The spectators choose whether to redistribute costs between two workers. We use a standard spectator framework to guide the analysis of how the spectators make a trade-off between implementing equality and efficiency in this setting (Almås et al., 2016; Cappelen, Konow, Sørensen, and Tungodden, 2013). In our framework, the spectators care about *fairness* and *efficiency*. Formally, the spectators' utility function is given by:

$$V(y;\cdot) = -\frac{\beta}{2}(y-m)^2 - \psi y \tag{3}$$

where $\beta > 0$ is the weight attached to fairness relative to efficiency; y is the share of total income to the unlucky worker, m is the spectators' perceived fair share of total income for the unlucky worker, and ψ is the redistribution cost. The optimal solution is given by:

$$y^* = m - \frac{\psi}{\beta} \tag{4}$$

The model captures that the spectators may differ in two respects: i.e., what they think is fair, m, and how much weight should be attached to fairness relative to efficiency, β.

It follows from (4) that spectators who mainly care about fairness should redistribute earnings such that the actual share to the unlucky workers equals the perceived fair share (i.e., $\beta \to \infty$ implies that $y^* \to m$). By contrast, spectators who mainly care about efficiency should choose to not redistribute at all (i.e., $\beta \to 0$ implies that $y^* \to 0$). If $m = \frac{1}{2}$, we have the standard equality–efficiency trade-off.[6]

4. Empirical strategy: Experiment 1

We prespecified our analysis in a document uploaded to the AEA RCT Registry prior to starting the data collection. This section outlines the main specifications from the preanalysis plan.[7]

4.1. Analysis of beliefs

4.1.1. Main treatment effects

In the first specification of interest, we test the effects of our treatment manipulations. First, we investigate whether the spectators have beliefs about behavioral responses to taxation that are consistent with the standard model in economics, according to which individuals only care about their own personal incentives. Second, we study the robustness of the main treatment by manipulating the recipient of the tax revenue. We estimate treatments effects with the following regression:

$$\text{diff}_i = \alpha_0 + \alpha_1 \text{Low\_Pay}_i + \alpha_2 \text{Redistributive\_Tax}_i + \phi \mathbf{X}_i + \varepsilon_i \tag{5}$$

where

- diff_i — individual i's belief about the percentage change in production between workers offered Bonus A and workers offered Bonus B.
- Low_Pay_i — an indicator for whether subject i was in the Low Pay treatment.
- $\text{Redistributive\_Tax}_i$ — an indicator for whether subject i was in the redistributive tax treatment.

[6] Almås et al. (2016) find that the majority of Americans consider an equal split as fair when incomes are determined by luck.

[7] The preanalysis plan is available from the following link: `https://www.socialscienceregistry.org/trials/2186`.

- $\mathbf{X}_i$ — a vector of controls (we also report results without controls).[8]
- ε_i — an individual-level error term. For all specifications, we use robust standard errors.

According to the standard model in economics, workers should provide the same level of effort in all three treatments. We are interested in whether we can reject the null hypothesis that people's beliefs are in line with the standard model in economics; i.e., whether $\alpha_1, \alpha_2 = 0$.

4.1.2. Do Republicans and Democrats have different beliefs?

In the second specification of interest, we investigate whether Republicans and Democrats have different beliefs about how personal and social incentives shape work effort:

$$\begin{aligned} \text{diff}_i = \alpha_0 + \alpha_1 \text{Low\_Pay}_i + \alpha_2 \text{Redistributive\_Tax}_i + \alpha_3 \text{R}_i + \alpha_4 \text{Low\_Pay}_i \times \text{R}_i \\ + \alpha_5 \text{Redistributive\_Tax}_i \times \text{R}_i + \phi \mathbf{X}_i + \varepsilon_i \end{aligned} \quad (6)$$

where R_i is an indicator for whether subject *i* is a verified Republican.

We are interested in whether we can reject the null hypothesis that Republicans and Democrats do not differ in their beliefs about how taxes affect work effort. We study this question in two different settings. We first look at whether Democrats and Republicans have different beliefs about how workers respond to *paying taxes to the government*; i.e., whether $\alpha_3 = 0$. We then use the Low Pay treatment to shed light on the underlying mechanisms as to why Republicans and Democrats may differ in their beliefs about how paying taxes to the government affects behavior. First, testing whether $\alpha_3 + \alpha_4 = 0$ allows us to answer whether Republicans and Democrats have different beliefs about how the workers respond to a lower personal incentive. Second, testing whether $\alpha_3 + \alpha_5 = 0$ allows us to test whether Republicans and Democrats have different beliefs about the effect of a tax when the tax revenues are redistributed back to the workers as a lump-sum payment.

[8] We include the following indicator variables as controls: gender (male/female), age (older/younger than 44 years old), ethnicity (white/nonwhite), three regional indicators, household income (above/below $49,999), education (at least a 2-year college degree or not), employment (full-time employed or not), and political affiliation (Republican/Democrat). We also control for household size (coded continuously).

4.2. Analysis of equality–efficiency preferences

To analyze differences in equality–efficiency preferences, we run the following regression:

$$\text{amount}_i = \beta_0 + \beta_1 \text{R}_i + \phi \mathbf{X}_i + \varepsilon_i \tag{7}$$

where $\text{amount}_i \in \{1, 2, 3\}$ is the amount redistributed between the lucky and unlucky workers and $\mathbf{X}_i$ is a vector of controls which, in addition to demographics, include treatment indicators. We also estimate Equation (7) without demographic controls. We are primarily interested in whether Republicans and Democrats differ in the amount distributed; i.e., whether we can reject the null hypothesis that $\beta_1 = 0$.

4.3. Analysis of policy views on redistribution

To analyze whether our incentivized measures of beliefs about behavioral responses to taxation and equality–efficiency preferences are predictive of people's policy views on redistribution, we run the following regression:

$$\begin{aligned}\text{policy\_view}_i = {} & \delta_0 + \delta_1 \text{beliefs}_i + \delta_2 \text{beliefs}_i \times \text{Low\_Pay}_i \\ & + \delta_3 \text{beliefs}_i \times \text{Redistributive\_Tax}_i + \delta_4 \text{amount}_i + \phi \mathbf{X}_i + \varepsilon_i\end{aligned} \tag{8}$$

where policy_view is views on whether society should aim to equalize incomes in society, beliefs_i is belief about the percentage change in production between workers offered Bonus A or Bonus B, amount_i is the amount distributed between the lucky and unlucky workers, and $\mathbf{X}_i$ is a vector of controls, which include treatment indicators. The interaction terms between the treatment indicators and beliefs capture that beliefs measured in different treatments may be predictive of people's policy views. In this regression, we standardize all variables for ease of interpretation.

5. Results: Experiment 1

This section presents our main results from the first experiment. While we do not discuss all the prespecified specifications in the main text, Section D of the Online Appendix provides all the prespecified tables in the order stated in the preanalysis plan.

5.1. Beliefs about behavioral responses to taxation

In Figure 2, we study whether people have accurate beliefs about behavioral responses to taxation. We find that, on average across the treatments, the spectators believe that the workers will reduce production by 30.2 percent in response to a 50 percent reduction in the after-tax wage (an implied wage elasticity of 0.6). By contrast, the workers actually reduce production by 9.3 percent in response to a 50 percent reduction in the after-tax wage (an implied wage elasticity of 0.19). These overestimations of behavioral responses to changes in wages are of similar magnitude across treatments.

Figure 3 reports the distribution of people's beliefs about production, treatment status, and political affiliation. We observe that there is significant heterogeneity in beliefs within each treatment for both Democrats and Republicans. Strikingly, however, we observe no systematic differences in beliefs between Democrats and Republicans in either of the treatments. In the base treatment, Government Tax, 80.6 percent of Democrats and 83 percent of Republicans believe that workers will produce less when they must pay a 50 percent tax on earnings. If we instead look at the fraction who believe that production will decrease more than 50 percent in response to paying a 50 percent tax to the government, we find that this applies to 34.3 percent of Democrats and 32.3 percent of Republicans.

In Table 2, we investigate in a regression framework whether beliefs differ between treatments and between Republicans and Democrats. Column 1 shows that the spectators in the Government Tax treatment believe that workers will reduce their production by 34.3 percent in response to a 50 percent tax to the US government. Spectators in the Low Pay treatment believe that workers will reduce their production by 29.2 percent in response to a 50 percent reduction in the wage. The treatment difference of 5.1 percentage points is highly significant ($p<0.01$). This result demonstrates that the spectators believe that paying taxes to the government is more detrimental to production than paying workers a lower wage with the same personal incentives. Spectators in the Redistributive Tax treatment believe that workers will reduce their production by 27.1 percent in response to a 50 percent tax that benefits other workers. The difference of 7.3 percentage points from the Government Tax treatment is also highly significant ($p<0.01$), which shows that beliefs about behavioral responses to taxation depend on the recipient of the tax revenue. The difference in beliefs between spectators in the Low Pay and Redistributive Tax treatments is marginally significant ($p<0.10$), which is suggestive that the spectators think the workers are socially moti-

vated to pay taxes if the revenue benefits other workers. Given these findings, our first result can therefore be summarized as follows:

Result 1 *Beliefs about behavioral responses to taxation are not in line with the standard economics model, which predicts that workers only care about their personal incentives. We find that Americans think that paying taxes to the government are more detrimental to production than paying workers a lower wage with the same personal incentives. By contrast, we find suggestive evidence that Americans think people are socially motivated to pay taxes to the government if the taxes will benefit other workers.*

By our assumptions from Section 3.1, we can derive structural estimates of how much the spectators believe the workers would be willing to give up to increase tax revenue by \$1. We estimate these beliefs separately for Republicans and Democrats. As illustrated in Figure A.3, the point estimates indicate that Democrats and Republicans believe that the workers would be willing to give up 20 cents ($p<0.05$) and 14 cents ($p<0.10$), respectively, to *reduce* government tax revenue by \$1. By contrast, they believe the workers would be willing to give up 2 cents ($p=0.77$) and 13 cents ($p<0.10$), respectively, to *increase* worker tax revenue by \$1.

Column 2 shows that the estimated treatment effects are basically unchanged when we include controls. Furthermore, column 2 confirms that there are no significant differences in beliefs between Democrats and Republicans ($p=0.9$). In columns 3–4, we include interaction terms between the treatments and people's political affiliation. Column 4, which includes our set of controls, shows that Republicans and Democrats have virtually identical beliefs about the behavioral responses to a government tax ($p=0.98$). Furthermore, column 4 shows that Democrats and Republicans also have virtually identical beliefs about behavioral responses in the two other treatments. By contrast, we see significant correlations between beliefs and race, income, and college education (all $p<0.01$). The correlation between education and beliefs is particularly pronounced: e.g., across treatments, college graduates estimate that workers produce 14.5 percentage points less than that estimated by noncollege graduates. Our second main result is as follows.

Result 2 *We find no systematic differences between Republicans and Democrats in their beliefs about behavioral responses to taxation. We also find no systematic political differences in beliefs about the cost of providing effort or the social motivation of workers.*

5.2. Equality–efficiency preferences

Figure 4 reports the distribution of people's redistributive choices by treatment status and political affiliation. This figure documents a striking political difference in equality–efficiency preferences: i.e., across treatments, Republicans are much less willing than Democrats to redistribute income between workers. More specifically, we find that 54.2 percent of Republicans choose not to redistribute any income—and thus keep the 7:1 income distribution between the lucky and unlucky workers—compared to 43 percent of Democrats. The difference is highly significant ($p<0.01$). Republicans are thus more likely than Democrats to assign maximum weight on efficiency relative to equality. Looking at the fraction who choose to fully equalize incomes, we find that 30 percent of Democrats choose to implement the 3:3 ratio compared to 22.3 percent of Republicans. The difference is again highly significant ($p<0.01$). Furthermore, only 2.9 percent of the respondents reverse the inequality by implementing the 1:4 income distribution.

Figure 5 illustrates the importance of equality–efficiency preferences by comparing the raw difference in support for redistribution in society between i) those willing to redistribute income between the workers and ii) Democrats and Republicans. Strikingly, we find that the policy difference between those willing to redistribute income between the workers amounts to exactly two-thirds of the Republican–Democrat difference in policy views.

Table 3 shows a regression of the amount redistributed between workers where we control for treatment status. Column 1 shows that Republicans on average redistribute 20 cents less than Democrats do. Column 2, where we include our full set of controls, shows that being Republican is the strongest predictor of the amount redistributed. We also observe negative correlations between the amount redistributed and being male ($p<0.01$), white ($p<0.01$), having high income ($p<0.01$), and having a college degree ($p<0.05$).

We can summarize our third main finding as follows:

Result 3 *We find systematic differences between Republicans and Democrats in their equality–efficiency preferences. In a real redistributive setting with a redistribution cost, Democrats are 11.1 percentage points more likely to redistribute incomes than Republicans.*

5.3. Demand for redistribution: Beliefs versus preferences

We have uncovered significant heterogeneity in both beliefs about behavioral responses to taxation and equality–efficiency preferences. We now turn to the question of whether the heterogeneity we observe in beliefs and preferences is associated with people's perspectives on income redistribution in society.

In column 1 of Table 4, we regress our belief measures on people's support for equalization of incomes in society. We find that beliefs fail to predict people's support for equalization of incomes in society. By contrast, column 2 shows that people's equality–efficiency preferences (the amount redistributed) strongly predict support for equalization of incomes in society: i.e., a one standard deviation (SD) change in the amount redistributed is associated with a one SD change in support for equalization ($p<0.01$). Columns 3 and 4 show that these results are robust to including controls in the regressions. Thus, our fourth main finding is the following:

Result 4 *Equality–efficiency preferences are strongly associated with views on whether society should equalize incomes. By contrast, beliefs about behavioral responses to taxation fail to predict people's perspectives on whether society should aim to equalize incomes.*

6. Second experiment

One reason as to why we did not find any systematic differences in beliefs between Republicans and Democrats in the first experiment—despite the fact that Republicans and Democrats tend to express very polarized beliefs in nonincentivized opinion surveys (Newport, 2016)—could be that the first experiment elicited beliefs in a nonpolitical context where participants plausibly did not consider the political "implications" of their stated beliefs. In the second experiment, we explore whether a political context polarizes beliefs by priming the respondents about the political debate on taxation and party views on behavioral responses to taxation. Importantly, we also assess the robustness of our main findings from the first experiment by replicating the Government Tax treatment and the elicitation of equality–efficiency preferences in the second experiment.

6.1. Sample and design

We recruited 5,579 spectators to participate in the second experiment.[9] As in the first experiment, we exclusively recruited Democrats and Republicans from Research Now's *Political Panel*. The sample was similarly recruited to match the general US population in terms of gender, age, income, race, and geography. Table 5 provides the summary statistics.

The second round included two treatments in addition to the Government Tax treatment: i.e., the Motivated Beliefs and Group Identity treatments. In these treatments, we prime people about the political debate on taxation and party views on behavioral responses to taxation, respectively. In the Motivated Beliefs treatment, we emphasize that a key issue in the political debate on taxation is how taxes "affect people's willingness to work hard." In the Group Identity treatment, we emphasize that political parties disagree about how taxes affect people's willingness to work hard and that "the Republican Party more often than the Democratic Party claims that taxes discourage people from working hard." These treatments allow us to provide evidence on whether people's beliefs about behavioral responses to taxation are motivated by a desire to justify their existing attitudes or motivated by a desire to enhance their political group identity, respectively (Alesina and Giuliano, 2011; Bénabou, 2015).

After the belief elicitation, we elicit equality–efficiency preferences in the same way as in the first experiment. To incentivize choices in this task, we recruit additional 1,194 workers from MTurk to participate in the lottery. At the end of the experiment, we elicit attitudes towards redistribution of income in society. We first ask the same question as in the first question; i.e., whether they think "a society should aim to equalize incomes." In the second experiment, we also added a second measure of views on redistribution that directly addresses support for redistribution through the tax system: "*Where would you rate yourself on a scale from 1 to 10, where 1 means "I think the US should increase income taxes to reduce inequality" and 10 means: "I think the US should* ***not*** *increase income taxes to reduce inequality."*

[9] We submitted a preanalysis plan to the AEA RCT Registry under the same trial as the first experiment prior to starting the data collection.

6.2. Replication of main results

We first assess whether our main results from the first experiment replicate in the second experiment. Columns 1–6 of Table 6 shows the results for beliefs about behavioral responses to taxation (the Government Tax treatment). Column 3 shows that the small raw difference in beliefs between Republicans and Democrats is marginally significant in the second experiment: i.e., Republicans estimate that workers produce 4.2 percentage points less under a government tax than Republicans do ($p<0.10$). When we include controls (column 4), the Republican–Democrat difference becomes statistically significant ($p<0.05$). We observe correlations in the opposite directions for whites and college graduates who estimated that workers produce, respectively, 11 and 11.4 percentage points more than nonwhites and noncollege graduates estimated. These correlations for whites and college graduates were also significant and of similar magnitudes in the first experiment (as shown in column 2). We note that while the Republican–Democrat difference in beliefs is statistically significant in the second experiment, it corresponds to less than half of the college difference in beliefs. Furthermore, when we pool the data from both experiments (columns 5–6), the Republican–Democrat difference is insignificant without controls and marginally significant with controls. The Republican indicator is also not significantly different across experiments (p=0.182 with controls; p=0.152 without controls). Overall, these results confirm our finding from the first experiment that we can reject large differences in beliefs about behavioral responses to taxation between Republicans and Democrats.

Columns 7–12 show results for equality–efficiency preferences (the amount redistributed). We see that there is a robust and strong correlation between Republicans and the amount distributed across specifications and experiments. We also see that the two other background characteristics that significantly correlate with the amount redistributed in the first experiments, i.e., white and income, are also the only significant correlations besides political views in the second experiment (although the correlation between income and amount redistributed is only marginally significant in the second experiment). Overall, the second experiment also confirms that our results on equality–efficiency preferences are very robust.

Furthermore, using the pooled data, we show that these results are also robust to using dummy variables for beliefs and preferences (as illustrated in Figure A.5). We also show that the results are robust to reweighting the data based on six cells based

on age, race, and education to match the underlying demographics of Republicans and Democrats (as illustrated in Figure A.6). Finally, we replicate the result that equality–efficiency preferences significantly predict policy views on redistribution, whereas beliefs fail to do so (as illustrated in Table A.1).

6.3. Treatment effects of political primes

We now investigate whether the priming treatments cause polarization in beliefs and preferences between Republicans and Democrats. To test this question, we estimate the following regression:

$$\begin{aligned} y_i = \rho_0 + \rho_1 R_i + \rho_2 \text{Motivated\_Beliefs}_i + \rho_3 \text{Group\_Identity}_i \\ + \rho_4 \text{Motivated\_Beliefs}_i \times R_i + \rho_5 \text{Group\_Identity}_i \times R_i + \phi \mathbf{X}_i + \varepsilon_i \end{aligned} \tag{9}$$

where y_i is the outcome of interest (beliefs, equality–efficiency preferences, and policy views on redistribution), Motivated Beliefs$_i$ and Group Identity$_i$ are treatment indicators, and $\mathbf{X}_i$ is a vector of controls. The main coefficients of interest are ρ_4 and ρ_5; i.e., whether the treatments cause polarization in beliefs and preferences between Republicans and Democrats.

Table 7 presents the results from this regression. Column 1 shows that the Motivated Beliefs treatment, in which we emphasized that a key issue in the political debate on taxes is how they affect people's willingness to work hard, made Democrats and Republicans alike believe in a higher incentive cost of taxation. One interpretation of this result is that this treatment mainly succeeded in making the negative aspects of taxation more salient, which triggered the same response from both Democrats and Republicans. In the Group Identity treatment, in which we highlighted that the Democratic Party and Republican Party had different views on whether taxes discourage people from working hard, we see no treatment effects on beliefs.

Column 2 shows whether the treatments affected people's equality–efficiency preferences. Interestingly, we find evidence of political polarization in both treatments. In the Motivated Beliefs treatment, political polarization increases by 0.14 of a SD. The effect is marginally significant ($p<0.10$). We observe a similar effect size for the interaction effect in the Group Identity treatment, which increases political polarization by 0.15 of a SD ($p<0.05$). These effects are mostly driven by Democrats who redistribute more in both treatments.

Columns 3 and 4 show whether the treatments affected people's policy views on redistribution. While we do not observe any treatment effects on the more principled question of whether society should aim to equalize incomes, we do find evidence of polarization on the question of whether income taxes should be increased to reduce inequality. In the Motivated Beliefs treatment, political polarization increases by 0.08 of a SD, but the effect is not statistically significant (p=0.21). For the Group Identity treatment, we see a lager and statistically significant increase in polarization equal to 0.14 of a SD ($p<0.05$). This effect is about equally driven by Democrats becoming more in favor of higher taxes and Republicans becoming less in favor of higher taxes. The effect size corresponds to almost one fifth of the Republican–Democrat difference in views on whether to increase taxes to reduce inequality. This result clearly demonstrates that people form their policy views on redistributing taxation to enhance their political group identity to some extent.

Our fifth main finding can be summarized as follows:

Result 5 *Priming respondents about the political debate on taxation and party views on behavioral responses on taxation increases political polarization in equality–efficiency preferences and views on redistributive tax policies, but do not cause political polarization in beliefs.*

Overall, the increased polarization in both equality–efficiency preferences and policy views on redistributive taxation, but not in beliefs, suggests that social preferences become even more important to understanding disagreements about redistribution in a political context. That we do not find political polarization in beliefs may also reflect that we had an incentivized belief elicitation, which made it costly to distort own beliefs (Bullock et al., 2015).

7. Conclusion

In this paper, we provide novel evidence on the role of beliefs about behavioral responses to taxation and equality–efficiency preferences in driving people's demand for redistribution. Eliciting incentivized measures of beliefs and preferences, we find no evidence of large differences in beliefs about incentive costs between Republicans and Democrats, but we do find strong evidence of large differences in equality–efficiency preferences. Furthermore, while equality–efficiency preferences are strongly

associated with people's policy views on redistribution, we find that beliefs about incentive costs fail to predict people's policy views.

Overall, our results strongly suggest that equality–efficiency preferences are more important than beliefs about incentive costs for understanding political disagreements about redistribution. This is not to say that Democrats and Republicans necessarily have identical beliefs about all aspects relevant for this debate. In particular, beliefs that interact with people's perceptions of fairness—such as trust in business elites—may also be instrumental to understand why voters have conflicting views on redistribution (Di Tella et al., 2017). An avenue for future research may be to further explore the importance of interactions between beliefs and perceptions of fairness in driving demand for redistribution.

References

Alesina, Alberto and George-Marios Angeletos (2005). "Fairness and redistribution," *American Economic Review*, 95(4): 960–980.

Alesina, Alberto and Paola Giuliano (2011). "Preferences for redistribution," in Jess Benhabib, Alberto Bisin, and Matthew O Jackson (eds.), "Handbook of Social Economics," volume 1, chapter 4, Amsterdam, NL: Elsevier, pp. 99–131.

Almås, Ingvild, Alexander W. Cappelen, and Bertil Tungodden (2016). "Cutthroat capitalism versus cuddly socialism: Are Americans more meritocratic and efficiency-seeking than Scandinavians?" mimeo.

Bénabou, Roland (2015). "The economics of motivated beliefs," *Revue d'économie politique*, 125(5): 665–685.

Bénabou, Roland and Efe A Ok (2001). "Social mobility and the demand for redistribution: The POUM hypothesis." *Quarterly Journal of Economics*, 116(2).

Bénabou, Roland and Jean Tirole (2006). "Incentives and prosocial behavior," *American Economic Review*, 96: 1652–1678.

Bolton, Gary E. and Axel Ockenfels (2000). "ERC: A theory of equity, reciprocity, and competition," *American Economic Review*, 90(1): 166–193.

Bullock, John G, Alan S Gerber, Seth J Hill, and Gregory A Huber (2015). "Partisan bias in factual beliefs about politics," *Quarterly Journal of Political Science*, 10: 519–578.

Cappelen, Alexander W., James Konow, Erik Ø. Sørensen, and Bertil Tungodden (2013). "Just luck: An experimental study of risk taking and fairness," *American Economic Review*, 103(3): 1398–1413.

Charness, Gary and Matthew Rabin (2002). "Understanding social preferences with simple tests," *Quarterly Journal of Economics*, 117(3): 817–869.

DellaVigna, Stefano and Devin Pope (2016a). "Predicting experimental results: Who knows what?" NBER Working Paper 22566, National Bureau of Economic Research.

DellaVigna, Stefano and Devin Pope (2016b). "What motivates effort? Evidence and expert forecasts," NBER Working Paper 22193, National Bureau of Economic Research.

Di Tella, Rafael, Juan Dubra, and Alejandro Luis Lagomarsino (2017). "Meet the oligarchs: Business legitimacy, state capacity and taxation," NBER Working Paper 22934.

Diamond, Peter and Emmanuel Saez (2011). "The case for a progressive tax: From basic research to policy recommendations," *Journal of Economic Perspectives*, 25(4): 165–190.

Fehr, Ernst and Klaus M. Schmidt (1999). "A theory of fairness, competition and cooperation," *Quarterly Journal of Economics*, 114(3): 817–868.

Fisman, Raymond, Pamela Jakiela, and Shachar Kariv (2015). "Distributional preferences and political behavior," Working Paper.

Kessler, Judd B. and Michael I. Norton (2016). "Tax aversion in labor supply," *Journal of Economic Behavior & Organization*, 124: 15–28.

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.

Mankiw, N Gregory, Matthew Weinzierl, and Danny Yagan (2009). "Optimal taxation in theory and practice," *Journal of Economic Perspectives*, 23(4): 147–74.

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

Newport, Frank (2016). "Americans still say upper-income pay too little in taxes," `http://www.gallup.com/poll/190775/americans-say-upper-income-pay-little-taxes.aspx`.

Persson, Torsten and Guido Tabellini (2000). *Political Economics: Explaining Economic Policy*, MIT Press.

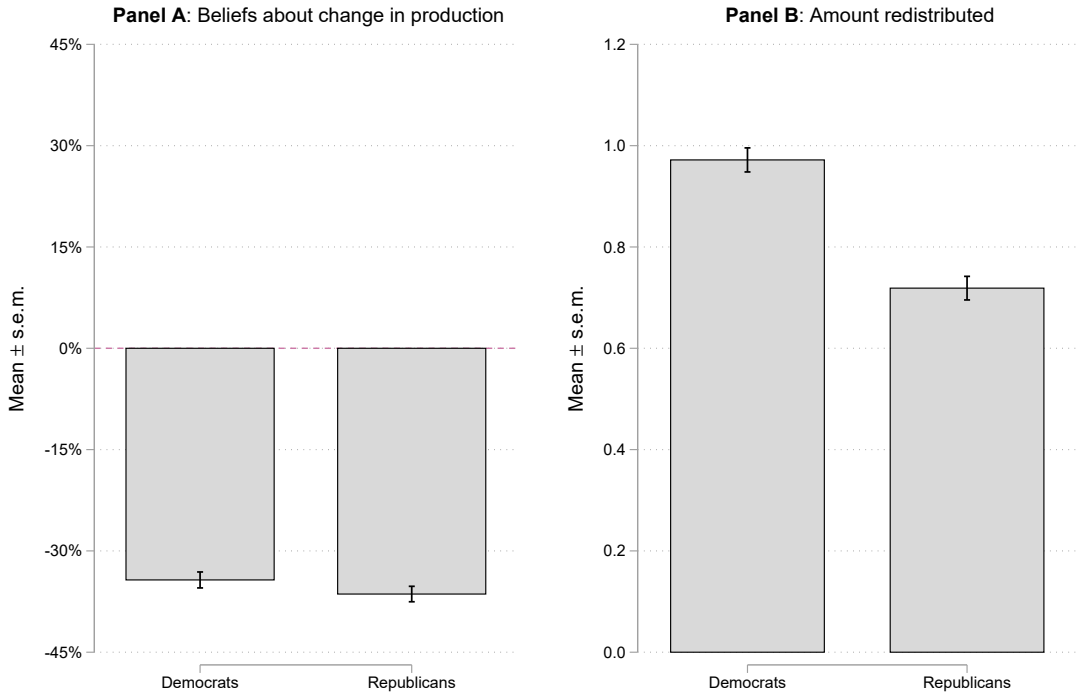
Piketty, Thomas (1995). "Social mobility and redistributive politics," *Quarterly Journal of Economics*, 110(3): 551–584.

Piketty, Thomas, Emmanuel Saez, and Stefanie Stantcheva (2014). "Optimal taxation of top labor incomes: A tale of three elasticities," *American Economic Journal: Economic Policy*, 6(1): 230–271.

Rick, Scott, Gabriele Paolacci, and Katherine Alicia Burson (2018). "Income tax and the motivation to work," *Journal of Behavioral Decision Making*.

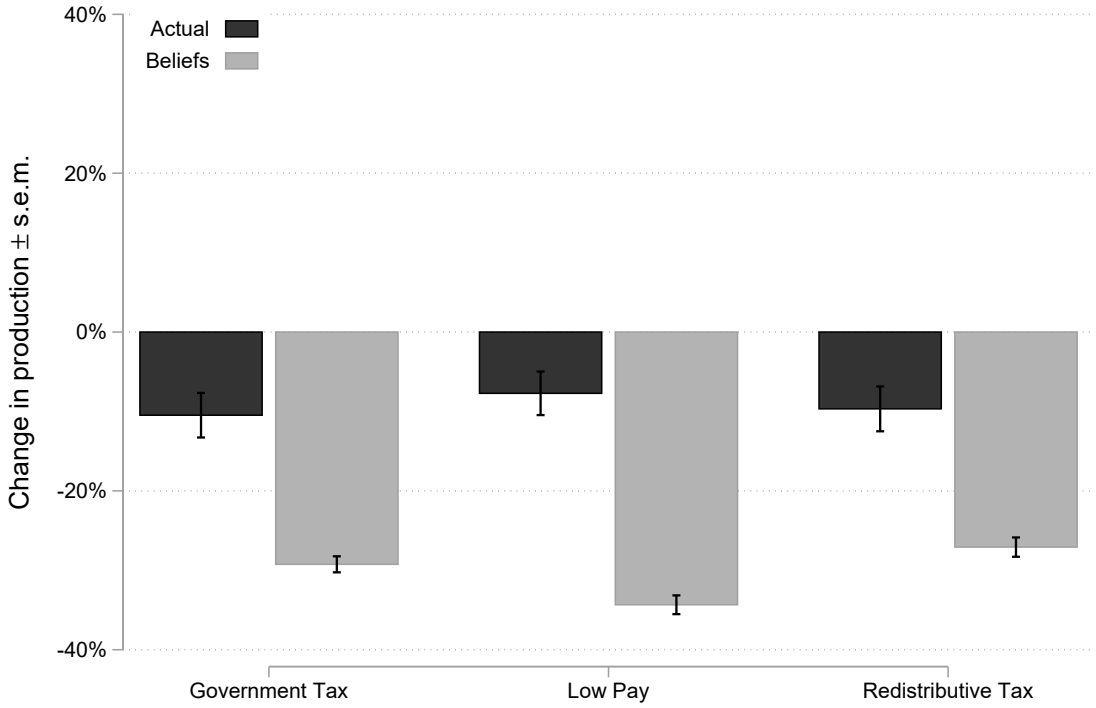
8. Main figures

Figure 1: Political differences in beliefs and preferences



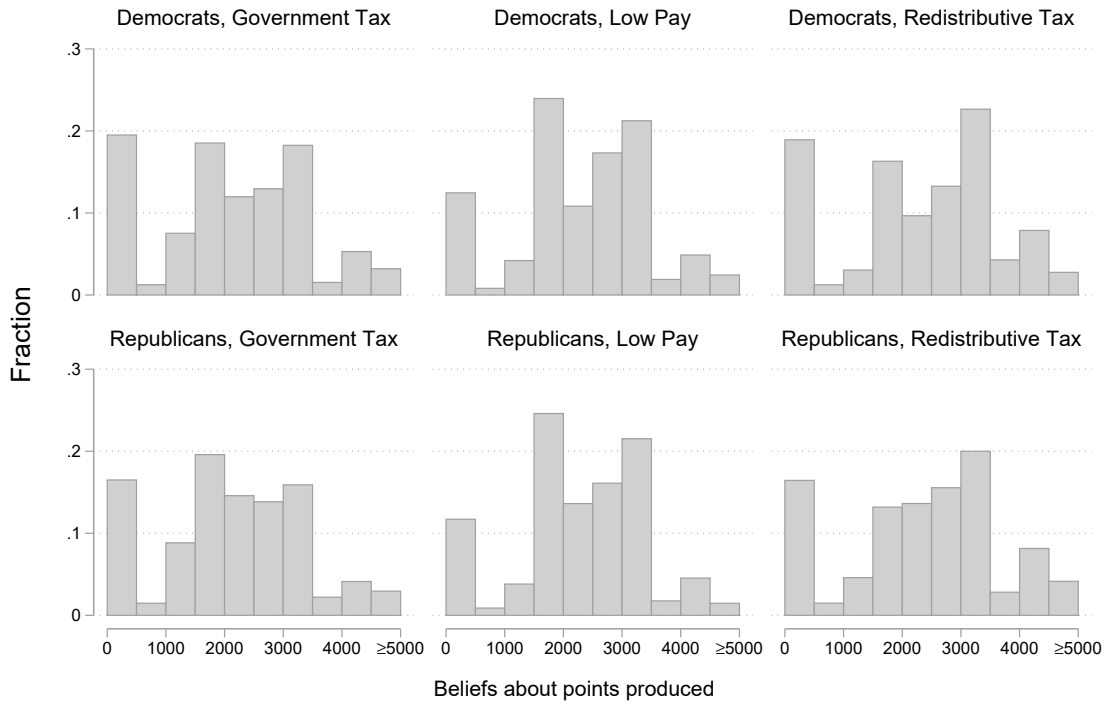
Notes: The bar indicate the mean values by political affiliation. The lines indicate the standard error of the mean. In **Panel A**, the outcome is people's beliefs about the change in production under High Pay or Government Tax treatments. In **Panel B**, the outcome is the amount redistributed in the spectator's decision. Panels include respondents from the Government Tax treatment in both experiments.

Figure 2: Beliefs versus actual: Experiment 1



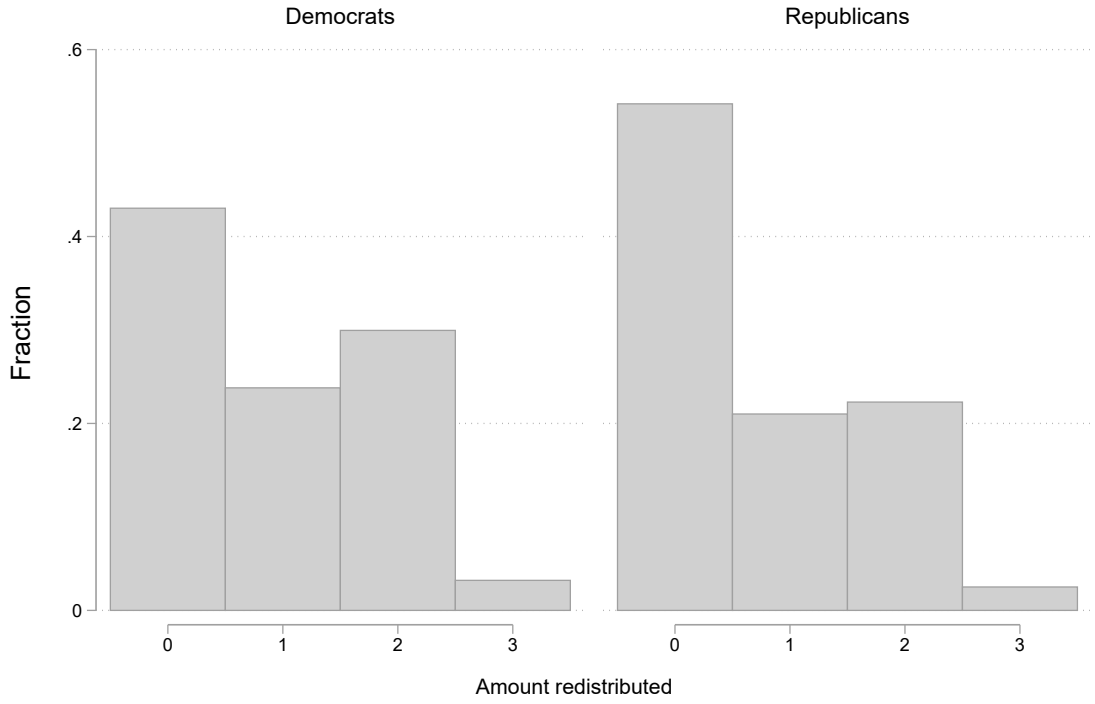
Notes: The figure shows the actual change in production and beliefs about change in production by each treatment.

Figure 3: Distribution of beliefs: Experiment 1



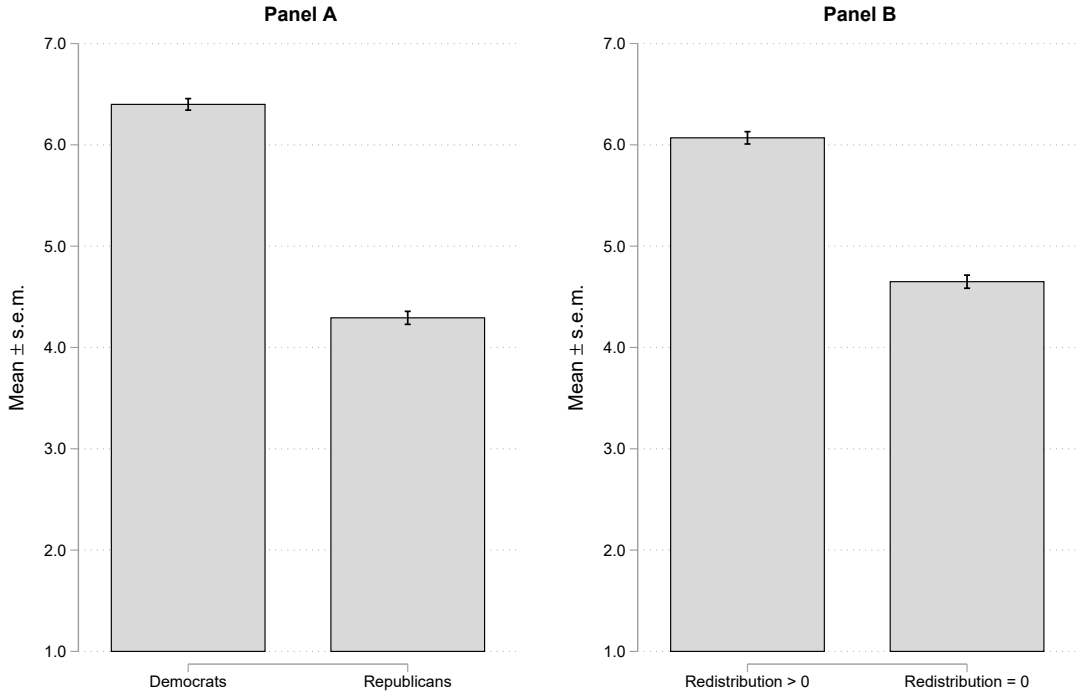
Notes: The figure shows the distribution of beliefs about the produced points by treatment and political affiliation.

Figure 4: Distribution of equality–efficiency preferences: Experiment 1



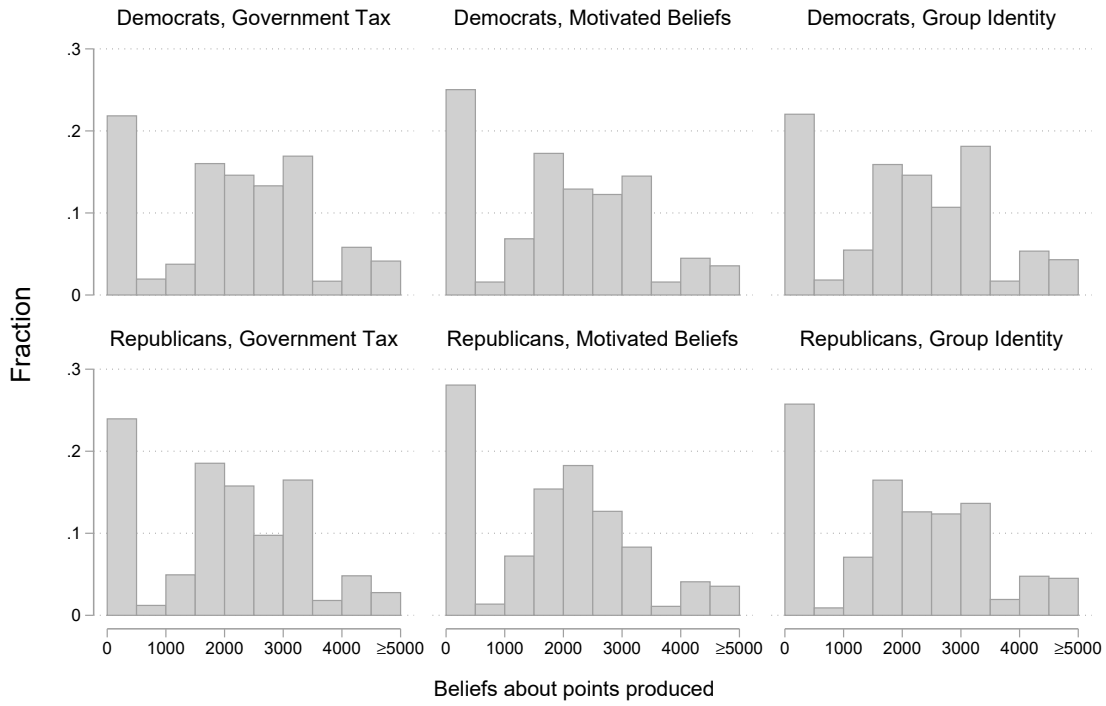
Notes: The figure shows the distribution of the amount redistributed between the lucky and unlucky workers by political affiliation. The treatment indicators are jointly insignificant in a regression on the amount redistributed (p=0.25).

Figure 5: Importance of equality–efficiency preferences on support for equalization of incomes in society: Experiment 1



Notes: The bar indicates the mean values of support for equalization in incomes in society by political affiliation (**Panel A**) and willingness to redistribute income as spectator (**Panel B**). The lines indicate the standard error of the mean. Panels include respondents from all three treatments.

Figure 6: Distribution of beliefs: Experiment 2



Notes: The distribution of beliefs about points produced according to treatment and political affiliation.

9. Main tables

Table 1: Summary statistics: Experiment 1

	(1) Full sample	(2) Republicans	(3) Democrats
Male	0.458	0.438	0.476
Age (>45 years)	0.556	0.575	0.537
White	0.757	0.801	0.715
Household size	2.320	2.352	2.290
Income (> USD 50,000)	0.535	0.554	0.517
College (At least 2-year college degree)	0.893	0.902	0.884
Full-time employee	0.497	0.487	0.506
Northeast	0.192	0.158	0.224
Midwest	0.219	0.211	0.226
West	0.248	0.257	0.240
Observations	4218	2037	2181

Note: Summary statistics for respondents in the first experiment.

Table 2: Treatment effects of varying the recipient of the tax revenue

	(1)	(2)	(3)	(4)
Low Pay	5.09***	4.77***	5.82***	5.58**
	(1.55)	(1.54)	(2.22)	(2.19)
Redistributive Tax	7.26***	7.12***	6.47***	6.63***
	(1.70)	(1.69)	(2.39)	(2.37)
Republican		-0.17	0.49	0.06
		(1.32)	(2.36)	(2.37)
Male		-0.53		-0.55
		(1.31)		(1.31)
Age > 45 years old		-0.39		-0.37
		(1.45)		(1.45)
White		5.24***		5.22***
		(1.67)		(1.67)
Income > 45,000 USD		2.85**		2.85**
		(1.41)		(1.41)
2-year college degree		14.54***		14.52***
		(2.45)		(2.45)
Full-time employment		0.72		0.71
		(1.45)		(1.45)
Low Pay × Republicans			-1.51	-1.68
			(3.11)	(3.09)
Redistributive Tax × Republicans			1.64	1.02
			(3.39)	(3.38)
Constant	-34.34***	-53.04***	-34.58***	-53.13***
	(1.18)	(3.53)	(1.68)	(3.68)
N	4218	4217	4218	4217
R-sq	0.005	0.021	0.005	0.021
Controls	No	Yes	No	Yes

Note: Dependent variable: Beliefs about change in production. The controls were prespecified and include an indicator for household size and regional indicators in addition to the coefficients displayed in the table.

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses.

Table 3: Dependent variable: Amount redistributed between workers

	(1)	(2)
Republican	-0.20***	-0.19***
	(0.03)	(0.03)
Male		-0.07**
		(0.03)
Age > 45 years old		-0.02
		(0.03)
White		-0.13***
		(0.03)
Income > 45,000 USD		-0.10***
		(0.03)
2-year college degree		-0.10**
		(0.05)
Full-time employment		-0.03
		(0.03)
Constant	0.95***	1.29***
	(0.03)	(0.07)
N	4217	4217
R-sq	0.013	0.024
Controls	No	Yes
Treatment indicators	Yes	Yes

Note: The controls were prespecified and include, in addition to the coefficients displayed in the table, an indicator for household size and regional indicators. In both columns, we include controls for treatment status. The treatment indicators are jointly insignificant in a regression on the amount redistributed (p=0.25).

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses.

Table 4: Views on redistribution – beliefs or preferences?

	(1)	(2)	(3)	(4)
Beliefs	-0.01		0.02	0.02
	(0.03)		(0.03)	(0.03)
Beliefs × Government Tax	0.00		-0.02	-0.01
	(0.04)		(0.04)	(0.04)
Beliefs × Redistributive Tax	-0.06		-0.07	-0.06
	(0.04)		(0.04)	(0.04)
Preferences (amount redistributed)		0.23***	0.23***	0.17***
		(0.02)	(0.02)	(0.01)
N	4217	4217	4217	4217
R-sq	0.002	0.051	0.052	0.201
Treatment indicators	Yes	Yes	Yes	Yes
Controls	No	No	No	Yes

Note: Dependent variable: Support for equalization of incomes in society. *Beliefs* refers beliefs about the difference in production between the High Pay treatment and the Government Tax treatment and *Preferences* refers to the amount redistributed between the two workers. All variables have been z-scored. Controls were prespecified and include race, gender, income, household size, region, employment, and education.

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses.

Table 5: Summary statistics: Experiment 2

	(1) Full sample	(2) Republicans	(3) Democrats
Male	0.491	0.492	0.489
Age (>45 years)	0.520	0.520	0.521
White	0.756	0.808	0.704
Household size	2.391	2.439	2.342
Income (> USD 50,000)	0.631	0.641	0.621
College (At least 2-year college degree)	0.882	0.864	0.899
Full-time employee	0.544	0.544	0.544
Northeast	0.190	0.190	0.190
Midwest	0.225	0.222	0.228
West	0.223	0.202	0.244
Observations	5979	2998	2981

Note: Summary statistics for respondents in the second experiment.

Table 6: Replication of main results

	Beliefs about behavioral responses to taxation						Equality-efficiency preferences (amount redistributed)					
	(1) Exp. 1	(2) Exp. 1	(3) Exp. 2	(4) Exp. 2	(5) Pooled	(6) Pooled	(7) Exp. 1	(8) Exp. 1	(9) Exp. 2	(10) Exp. 2	(11) Pooled	(12) Pooled
Republican	0.49	-0.62	-4.22*	-5.49**	-2.03	-3.14*	-0.28***	-0.26***	-0.23***	-0.20***	-0.25***	-0.23***
	(2.36)	(2.41)	(2.29)	(2.32)	(1.65)	(1.66)	(0.05)	(0.05)	(0.05)	(0.05)	(0.03)	(0.03)
Male		-2.89		-3.12		-3.18*		-0.05		0.00		-0.02
		(2.34)		(2.33)		(1.64)		(0.05)		(0.05)		(0.03)
Age > 45 years old		2.46		-3.23		-0.43		0.03		-0.06		-0.02
		(2.62)		(2.51)		(1.81)		(0.06)		(0.05)		(0.04)
White		6.61**		10.99***		8.67***		-0.21***		-0.22***		-0.22***
		(2.95)		(2.99)		(2.10)		(0.06)		(0.06)		(0.04)
Income > 45,000 USD		2.07		0.38		1.48		-0.14***		-0.09*		-0.11***
		(2.61)		(2.52)		(1.80)		(0.05)		(0.05)		(0.04)
2-year college degree		14.04***		11.43***		12.68***		-0.07		-0.05		-0.06
		(4.03)		(3.85)		(2.77)		(0.08)		(0.08)		(0.05)
Full-time employment		-0.38		-4.05*		-2.35		0.03		0.03		0.03
		(2.61)		(2.45)		(1.78)		(0.05)		(0.05)		(0.04)
Constant	-34.58***	-54.36***	-34.04***	-46.59***	-31.53***	-47.99***	0.98***	1.29***	0.96***	1.24***	0.97***	1.26***
	(1.68)	(5.89)	(1.66)	(5.82)	(2.75)	(4.70)	(0.04)	(0.12)	(0.03)	(0.11)	(0.06)	(0.09)
N	1397	1396	1606	1606	3003	3002	1396	1396	1606	1606	3002	3002
R-sq	0.000	0.018	0.002	0.024	0.001	0.019	0.023	0.039	0.015	0.040	0.019	0.036
Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Experiment fixed effects	No	No	No	No	Yes	Yes	No	No	No	No	Yes	Yes

Note: The controls were prespecified and include, in addition to the coefficients displayed in the table, an indicator for household size and regional indicators. We only include respondents from the Government Tax treatments.

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses.

Table 7: Treatment effects of political primes

	(1) Beliefs	(2) Preferences	(3) Equalize inc.	(4) Higher taxes
Motivated Beliefs	-6.24***	0.08*	0.03	0.06
	(2.35)	(0.05)	(0.04)	(0.05)
Group Identity	-1.21	0.11**	0.02	0.08*
	(2.35)	(0.05)	(0.04)	(0.05)
Republicans	-5.34**	-0.22***	-0.67***	-0.69***
	(2.29)	(0.05)	(0.05)	(0.05)
Motivated Beliefs × Republicans	1.31	-0.13*	-0.07	-0.08
	(3.27)	(0.07)	(0.07)	(0.07)
Group Identity × Republicans	1.06	-0.14**	-0.07	-0.14**
	(3.31)	(0.07)	(0.07)	(0.07)
Male	-3.86***	-0.01	-0.15***	0.14***
	(1.39)	(0.03)	(0.03)	(0.03)
Age > 45 years old	1.40	-0.07**	-0.16***	-0.19***
	(1.50)	(0.03)	(0.03)	(0.03)
White	11.49***	-0.16***	-0.24***	-0.12***
	(1.75)	(0.04)	(0.03)	(0.03)
Income > 45,000 USD	1.03	-0.06*	-0.18***	-0.00
	(1.50)	(0.03)	(0.03)	(0.03)
2-year college degree	14.78***	-0.01	-0.25***	0.06
	(2.27)	(0.05)	(0.05)	(0.05)
Full-time employment	-3.55**	-0.05	0.06**	-0.01
	(1.47)	(0.03)	(0.03)	(0.03)
N	4642	4642	4642	4642
R-sq	0.032	0.037	0.182	0.175
Controls	Yes	Yes	Yes	Yes

Note: *Beliefs* refers to beliefs about behavioral responses to taxation (points produced in the Government Tax treatment); *Preferences* refers to amount redistributed; *Equalize inc.* refers to support for equalization of incomes in society; and *Higher taxes* refers to support for higher income taxes to reduce inequality. Controls were prespecified and include race, gender, income, household size, region, employment, and education.

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses.

Online Appendix:
Beliefs about Behavioral Responses to Taxation

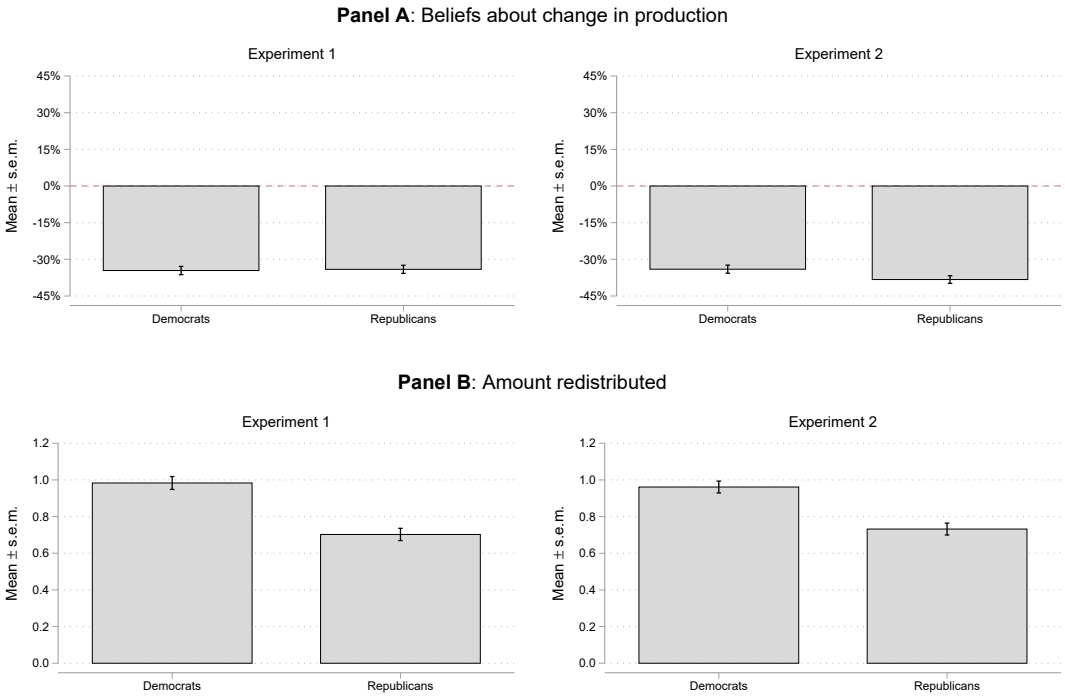
[OnLine English has removed author details to preserve confidentiality. Please replace them.]

Summary of the Online Appendix

Section A and Section B provide additional figures and tables, respectively. Section C provides some comments to the preanalysis plans. Section D provides all prespecified tables exactly as prespecified. Section E and Section F provide instructions for both experiments (also available in the preanalysis plans).

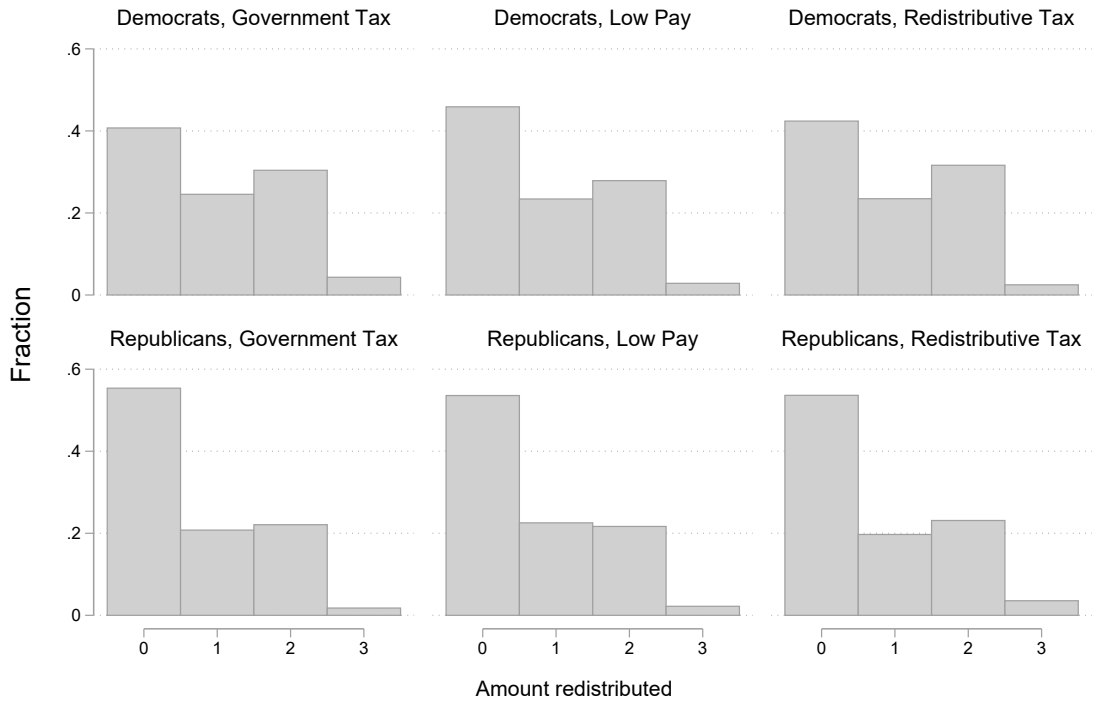
A. Additional figures

Figure A.1: Political differences in beliefs and preferences



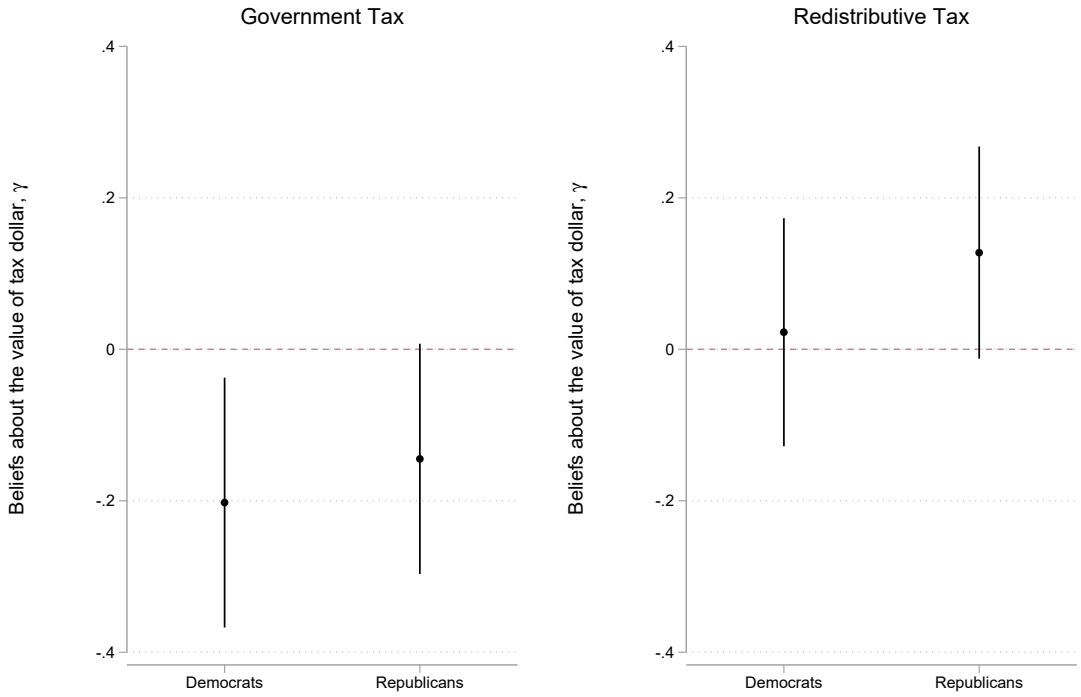
Notes: The bar indicates the mean values by political affiliation. The lines indicate the standard error of the mean. In **Panel A**, the outcome is people's beliefs about the change in production from High Pay to Government Tax treatments. In **Panel B**, the outcome is the amount redistributed in the spectator's decision. Panels include respondents from the Government Tax treatment in both experiments.

Figure A.2: Distribution of equality–efficiency preferences: Experiment 1



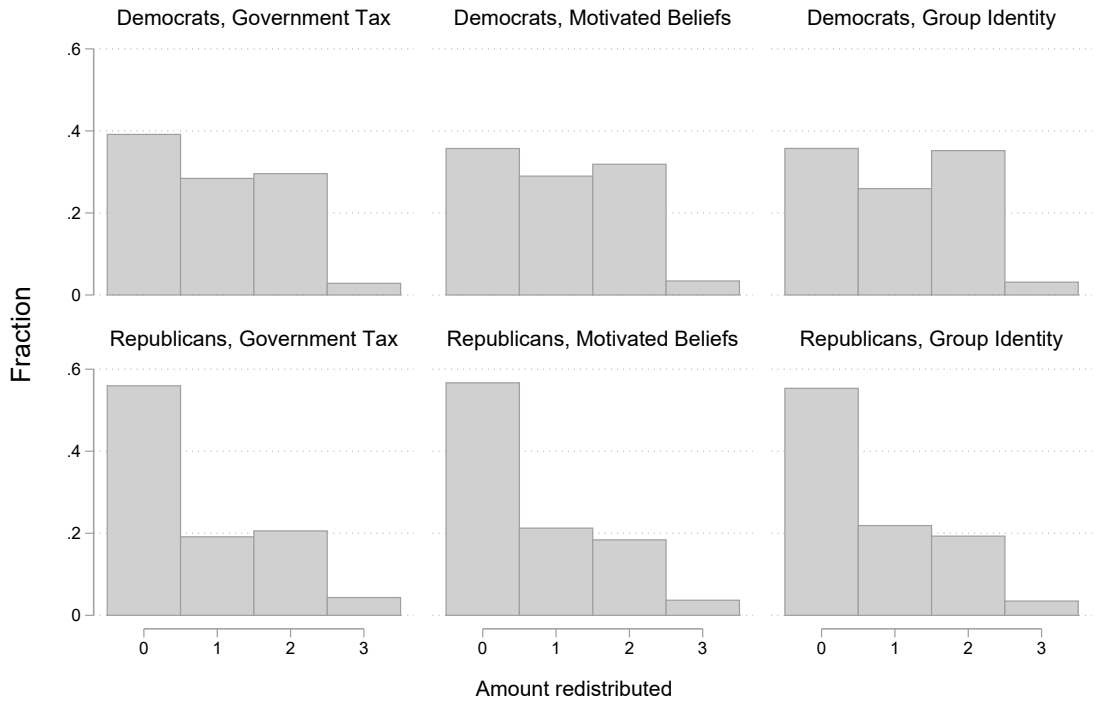
Notes: The figure shows the distribution of the amount redistributed between the lucky and unlucky workers by treatment and political affiliation.

Figure A.3: Structural estimates of beliefs about the value of a tax dollar



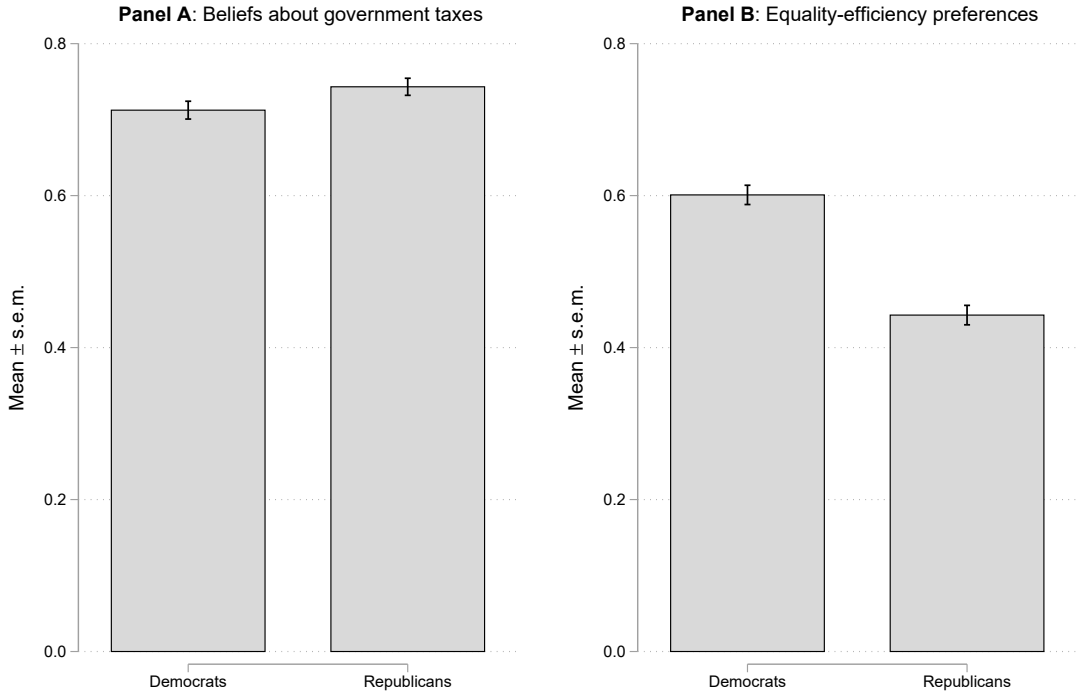
Notes: The figure shows structural estimates of beliefs about the value of a tax dollar by treatment and political affiliation. Lines indicate 95 percent confidence intervals. We assume that beliefs are formed by Equation (1) and that $c(e)$ in Equation (2) is quadratic (i.e., on the form ae^2, where a is a constant that is identified by the group-level by mean differences in beliefs between the Low Pay and Government Tax treatments).

Figure A.4: Distribution of equality–efficiency preferences: Experiment 2



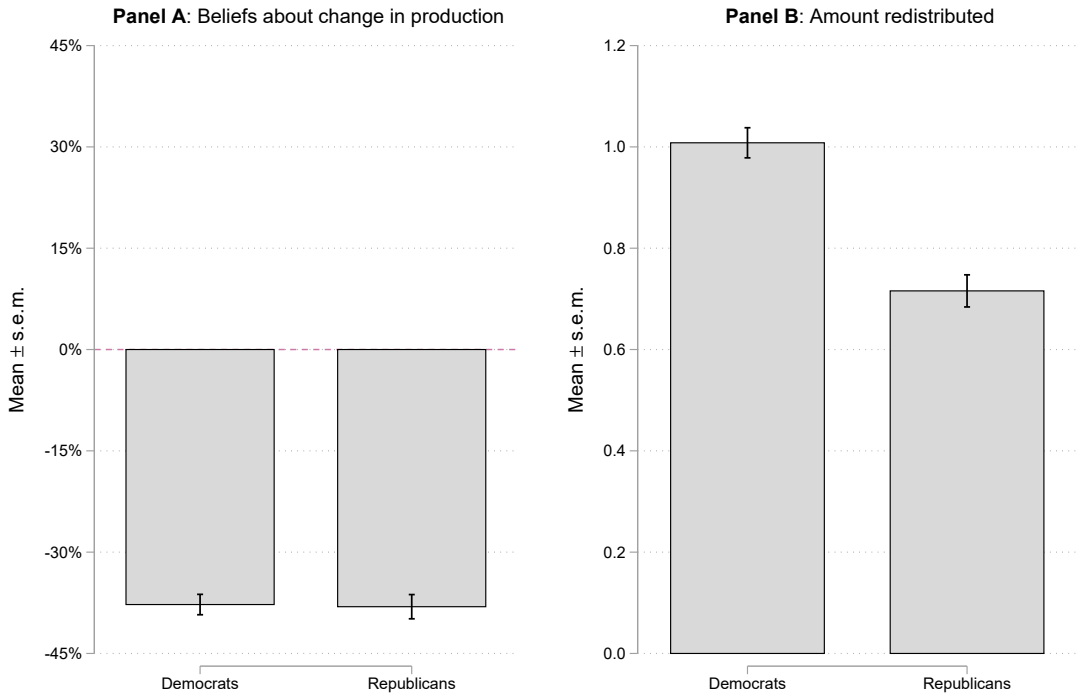
Notes: The figure shows the distribution of the amount redistributed between the lucky and unlucky workers by treatment and political affiliation.

Figure A.5: Political differences in beliefs and preferences: Robustness of dependent variable



Notes: The bar indicate the mean values by political affiliation. The lines indicate the standard error of the mean. In **Panel A**, the outcome is an indicator for whether respondents believe production will decrease by more than five percent in the Government Tax treatment. In **Panel B**, the outcome is an indicator for whether the respondents choose to redistribute income in the spectator's decision. Panels include respondents from the Government Tax treatment in both experiments.

Figure A.6: Political differences in beliefs and preferences: Reweighted data



Notes: The bar indicate the mean values by political affiliation. The lines indicate the standard error of the mean. In **Panel A**, the outcome is people's beliefs about the change in production from the High Pay to Government Tax treatments. In **Panel B**, the outcome is the amount redistributed in the spectator's decision. Panels include respondents from the Government Tax treatment in both experiments. The data has been reweighted to match the demographic profile of Republicans and Democrats separately with respect to six cells based on age (above/below 65 years old), race (white/nonwhite), and education (some college/not some college). We used data from Pew Research to create the weights, `http://www.people-press.org/2016/09/13/1-the-changing-composition-of-the-political-parties/` (accessed July 6, 2018).

B. Additional tables

Table A.1: Views on redistribution – beliefs or preferences?

	Main specification		Robustness	
	(1) Equal incomes	(2) Higher taxes	(3) Equal incomes	(4) Higer taxes
Beliefs	0.01	-0.02	-0.01	-0.03
	(0.02)	(0.02)	(0.02)	(0.02)
Preferences	0.18***	0.12***	0.18***	0.09***
	(0.02)	(0.02)	(0.02)	(0.02)
N	3002	1606	3002	1606
R-sq	0.196	0.172	0.195	0.168
Controls	Yes	Yes	Yes	Yes

Note: *Equal income* refers to support for equalization of incomes in society. *Higher taxes* refers to support for increasing income taxes to reduce income inequality. In the main specification (columns 1–2), *Beliefs* refers beliefs about the difference in production between the High Pay treatment and the Government Tax treatment and *Preferences* refers to the amount redistributed. In the second specification (columns 3–4), *Beliefs* is an indicator for believing that production decreased by more than five percent in the Government Tax treatment and *Preferences* is an indicator for redistributing at least some income in the spectator game. We include respondents from the Government Tax treatment. All variables have been z-scored. Controls were prespecified and include race, gender, income, household size, region, employment, and education.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses.

C. Comments to the preanalysis plans

We uploaded the first preanalysis plan to the AEA RCT Registry on May 2, 2017. We uploaded an updated version of this preanalysis plan on May 29, 2017 (on the same day, but before we started collecting data for the project). The only substantial difference between the two preanalysis plans is that we added a specification in Section 4.1.4 on whether our elicited beliefs about behavioral responses to taxation could explain differences in people's support for redistribution of income in society. The reader should consult the updated preanalysis plan when evaluating the prespecified tables in Section D. We uploaded a preanalysis plan for the second experiment on February 6, 2018 and started to collect data for this project on February 7, 2018.

Below we list some minor deviations from the preanalysis plans.

- We did not prespecify the investigation of treatment effects of the political primes on equality–efficiency preferences and policy views; i.e., columns 2–4 of Table 7 were not prespecified.
- We prespecified collecting 4500 and 6000 spectators for the first and second experiments, respectively. We actually recruited 4218 and 5979 spectators, respectively. The reason for the small discrepancy was that the market research company had difficulties recruiting enough respondents. We also prespecified to collect data for 1600 workers, but ended up recruiting 16 workers more (i.e., 1616 in total) because of a small glitch.

D. Prespecified tables

In this section, which should be read in conjunction with the preanalysis plans, we list all prespecified tables. For each table, we highlight the corresponding section in the preanalysis plans.

Table A.2: Dependent variable: Beliefs about absolute change in production

	(1)	(2)	(3)
Government Tax	154.37***	144.61***	169.20**
	(47.14)	(46.81)	(66.42)
Redistributive tax	-65.71	-71.35	-31.84
	(47.89)	(47.58)	(67.04)
Republicans		5.05	49.25
		(40.13)	(60.92)
Government Tax × Republicans			-51.06
			(93.66)
Redistributive tax × Republicans			-82.13
			(95.10)
Constant	886.76***	1463.41***	1441.64***
	(30.61)	(107.41)	(110.60)
N	4218	4217	4217
R-sq	0.005	0.021	0.021
Controls	No	Yes	Yes

Note: Columns 1 and 2 show the specification from Section 4.1.1. of PAP 1 (pages 6–7). Column 3 shows the specification from Section 4.1.2. the PAP (page 7).

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses.

Table A.3: Structural estimates of beliefs about the tax dollar value

	(1)
$\gamma_{T2}^{Democrat}$	-0.20**
	(0.08)
$\gamma_{T2}^{Republican}$	-0.14*
	(0.08)
$\gamma_{T3}^{Democrat}$	0.02
	(0.08)
$\gamma_{T3}^{Republican}$	0.13*
	(0.07)
N	4218
P-value of test $\gamma_{T2}^{Democrat} - \gamma_{T2}^{Republican} = 0$	0.61
P-value of test $\gamma_{T3}^{Democrat} - \gamma_{T3}^{Republican} = 0$	0.32

Note: The table shows the specification from Section 4.1.3. of PAP 1 (pages 8–9).
* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses.

Table A.4: Demand for redistribution and beliefs about behavioral responses

	(1)	(2)
diff	0.0000	0.0000
	(0.0001)	(0.0001)
diff × Government Tax	-0.0000	-0.0000
	(0.0001)	(0.0001)
diff × Redistributive Tax	0.0001	0.0001
	(0.0001)	(0.0001)
N	4217	4217
R-sq	0.001	0.172
Controls	No	Yes
P-value joint significance	0.221	0.616

Note: The table shows the specification from Section 4.1.4 of PAP 1 (pages 9–10).
* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses.

Table A.5: Political differences

	(1)
equal_inc1_mean	
Republicans	-1.91***
	(0.08)
equal_inc2_mean	
Republicans	-1.91***
	(0.08)
N	4217
P-value equality of Republican indicator	0.421

Note: The table shows the second specification ("Political differences") from Section 4.1.4 of PAP 1 (pages 9–10).

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses.

Table A.6: Exploratory analysis of heterogeneity in beliefs

	(1) Gender	(2) Age	(3) College	(4) White	(5) Income	(6) Work
Interactant	2.6	85.5	-451.1***	-185.4**	-111.3*	-15.2
	(61.0)	(64.2)	(121.4)	(77.2)	(62.9)	(63.5)
Government Tax × Interactant	77.5	-144.3	56.9	-22.8	38.7	47.6
	(93.2)	(93.6)	(169.2)	(113.2)	(94.1)	(93.4)
Redistributive Tax × Interactant	-36.2	-78.4	-29.6	101.6	36.7	-68.1
	(95.3)	(95.0)	(183.7)	(116.1)	(95.7)	(95.3)
N	4217	4217	4217	4217	4217	4217

Note: The table shows the specification from Section 4.1.5 of PAP 1 (pages 10–11).

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses.

Table A.7: Do taxes affect worker effort?

	(1)	(2)	(3)
Low Pay	-293.30***	-291.24***	-261.92**
	(85.66)	(85.25)	(125.59)
Government Tax	-317.59***	-330.90***	-352.63***
	(85.01)	(83.78)	(131.57)
Redistributive tax	-234.00***	-243.13***	-253.35**
	(83.09)	(82.78)	(126.46)
Republicans		94.63	-57.51
		(80.45)	(148.35)
Low Pay × Republicans			156.05
			(222.60)
Government Tax × Republicans			275.98
			(213.52)
Redistributive tax × Republicans			188.73
			(212.11)
Low Pay × Independents			-205.28
			(192.77)
Government Tax × Independents			-131.58
			(192.96)
Redistributive tax × Independents			-107.93
			(188.22)
Constant	3031.91***	2728.16***	2737.68***
	(57.04)	(171.91)	(183.27)
N	1616	1616	1616
R-sq	0.010	0.042	0.044
Controls	No	Yes	Yes
P-value joint significance	0.0004	0.0002	0.04
P-value coefficients equal	0.000414	0.000231	0.0354
P-value Republican interactions			0.622
P-value standard model (Democrats)			0.730
P-value standard model (Republicans)			0.974

Note: The table shows the specification from Section 4.2.1. and 4.2.2. of PAP 1 (pages 12–13).
* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses.

Table A.8: Worker beliefs

	(1)	(2)
Low Pay	-203.38**	-198.59**
	(79.33)	(78.48)
Government Tax	-195.99**	-205.47***
	(79.29)	(78.17)
Redistributive tax	-197.73**	-203.70***
	(77.50)	(76.57)
Constant	2825.84***	2619.23***
	(52.40)	(165.29)
N	1616	1616
R-sq	0.006	0.051
Controls	No	Yes
P-value joint significance	0.017	0.013
P-value coefficients equal	1.00	1.00

Note: The table shows the specification from Section 4.2.3. of PAP 1 (page 13).
* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses.

Table A.9: Do the treatments polarize beliefs?

	(1)	(2)	(3)
Motivated Beliefs	164.36***	169.09***	189.31***
	(50.00)	(49.40)	(71.20)
Group identity	11.62	19.27	36.86
	(50.67)	(49.93)	(71.16)
Republicans		137.62***	161.87**
		(41.28)	(69.41)
Motivated Beliefs × Republicans			-39.80
			(99.02)
Group identity × Republicans			-34.20
			(100.22)
Constant	1099.04***	1711.43***	1699.78***
	(34.70)	(106.49)	(110.34)
N	4641	4641	4641
R-sq	0.003	0.032	0.032
Controls	No	Yes	Yes

Note: The table shows the specification from Section 4.1.1. of PAP 1 (pages 3–4).
* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses.

Table A.10: Views on redistribution

	(1) Equalize income	(2) Higher taxes
Beliefs	0.00	-0.00
	(0.00)	(0.00)
Amount redistributed	0.61***	0.39***
	(0.08)	(0.08)
Motivated Beliefs	-0.27*	-0.14
	(0.15)	(0.16)
Group identity	-0.05	-0.03
	(0.15)	(0.16)
Motivated Beliefs × Amount redistributed	0.08	0.07
	(0.11)	(0.11)
Group identity × Amount redistributed	0.00	0.02
	(0.11)	(0.11)
Motivated Beliefs × Beliefs	0.00	0.00
	(0.00)	(0.00)
Group identity × Beliefs	-0.00	0.00
	(0.00)	(0.00)
Republicans	-1.96***	-2.26***
	(0.08)	(0.09)
Constant	7.71***	6.17***
	(0.22)	(0.24)
N	4641	4641
R-sq	0.222	0.189
Controls	Yes	Yes

Note: The table shows the specification from Section 4.1.2. of PAP 2 (pages 4–5).
* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses.

Table A.11: Second-order beliefs

	(1) Difference	(2) Second-order beliefs about Republicans
Second-order belifes about Democrats		0.73***
		(0.03)
Constant	-91.48***	319.37***
	(28.52)	(42.97)
N	1338	1338
R-sq	0.000	0.587

Note: The table shows the specification from Section 4.2.1. of PAP 2 (page 5).

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses.

E. Instructions: Experiment 1

E.1. Background questions

1. What is your age? [18–24; 25–34; 35–44; 45–54; 55–64; 65 or older]
2. What is your gender? [Male; Female]
3. What was your family's gross household income in 2016 in US dollars? [Less than $15,000; $15,000 to $24,999; $25,000 to $49,999; $50,000 to $74,999; $75,000 to $99,999; $100,000 to $149,999; $150,000 to $200,000; More than $200,000; Prefer not to answer]
4. Which of the following best describes your race or ethnicity? [African American/Black; Asian/Asian American; Caucasian/White; Native American, Inuit or Aleut; Native Hawaiian/Pacific Islander; Other; Prefer not to answer]
5. Are you of Hispanic, Latino, or Spanish origin? [Yes, No, Prefer not to answer]
6. In which state do you currently reside?

E.2. Introduction to task

Introduction

In this study, we will ask you about how well you think others performed on a task. To make you familiar with the task, we will let you test the task for up to two minutes before you answer the question. **If your answer is sufficiently close to how others actually performed on the task, you may earn a bonus of $10 in panel currency.**

Test of task

A matrix with numbers between 1 and 100 will appear on the next page. You gain 1 point for each even number that you check off in the matrix. You lose 1 point if you check off an odd number, but you do not lose any points for failing to check off an even number. After two minutes, the page will auto-advance to a new page that shows you how many points you have produced on this test, but you can choose to advance faster by submitting the page before the two minutes are up.

E.3. Feedback on test of task

You produced **{score}** points on this test of the task.

E.4. Treatment 1: Government Tax

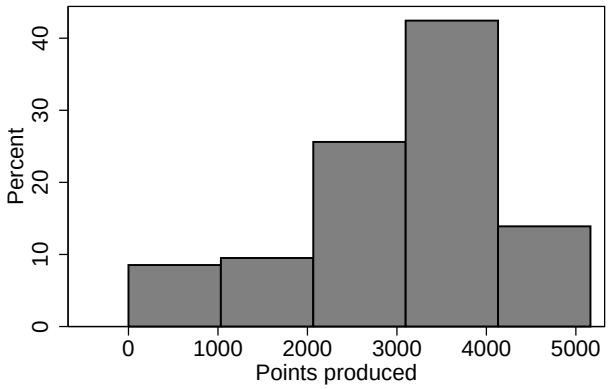
How well did others perform on the task?

A few days ago, we recruited 800 Americans from an online labor market to do the task you just tested. The task consisted of 30 matrices and the individuals could work for up to two minutes on each matrix (i.e., for up to 60 minutes in total). After each matrix, they were shown how many points they had produced.

Each individual was paid a flat fee of $2. In addition, each individual could earn a bonus. We randomly varied which bonus scheme an individual was offered. The individuals were only informed about their own bonus scheme.

- **Bonus A**: An individual would earn a bonus of **20 cents** for every **100 points** he produced.
- **Bonus B**: An individual would earn a bonus of **20 cents** for every **100 points** he produced, but had to pay a **tax of 50%** on the bonus. The individual was informed that the tax would be passed on to the US federal government for general use.

The figure below shows the variation in points produced for individuals offered **Bonus A**.



Note: The vertical axis indicates the percentage of people who produced points within the range indicated on the horizontal axis.

The individuals offered **Bonus A** produced 3032 points on average. What do you believe individuals offered **Bonus B** produced on average?

Individuals offered **Bonus B** produced [ ] points on average.

You will be rewarded a $10 bonus if your answer is within +/- 5% of actual production for individuals offered Bonus B.

E.5. Treatment 2: Low Pay (bonus description)

- **Bonus A**: An individual would earn a bonus of **20 cents** for every **100 points** he produced.
- **Bonus B**: An individual would earn a bonus of **10 cents** for every **100 points** he produced.

E.6. Treatment 3: Redistributive Tax (bonus description)

- **Bonus A**: An individual would earn a bonus of **20 cents** for every **100 points** he produced.
- **Bonus B**: An individual would earn a bonus of **20 cents** for every **100 points** he produced, but had to pay a **tax of 50%** on the bonus. The individual was informed that the tax revenues from all 400 individuals offered **Bonus B** would be split equally among them.

E.7. Equality–efficiency trade-off

We now want you to consider a new situation, involving different individuals from the previous task. A few days ago, we recruited two individuals—let us call them Person A and Person B—from an online labor market to answer an opinion survey. After answering all questions in the survey, we told them that their earnings from completing the survey would be determined by a lottery. The individual winning the lottery would earn $7 and the individual losing the lottery would earn $1.

We did not inform the two individuals about the outcome of the lottery. However, they were told that a third person would be informed about the situation, and given the opportunity to redistribute the earnings and thus determine how much they were paid for the completing the survey.

You are this third person and we now want you to choose whether to redistribute earnings from the individual who won the lottery to the individual who lost the lottery. Your decision is completely anonymous and will be implemented with a one in ten chance. If your decision is implemented, Person A and Person B will receive the payments that you choose within a few days. They will not receive any further information.

Person A won the lottery and earned $7 from completing the survey. Person B thus earned $1 from completing the survey. There is a redistribution cost. If you choose to redistribute, increasing Person B's payment by $1 will decrease Person A's payment by $2.

Please state which of the following alternatives you choose:

- *I do not redistribute*: Person A is paid $7 and Person B is paid $1.
- *I do redistribute*: Person A is paid $5 and Person B is paid $2.
- *I do redistribute*: Person A is paid $3 and Person B is paid $3.
- *I do redistribute*: Person A is paid $1 and Person B is paid $4.

E.8. Additional background questions

- 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)]
- 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 (e.g., retired or full-time parent)]
- **Including** yourself, how many people are currently living in your household?
- Where would you rate yourself on a scale from 1 to 10, where 1 means: "I think a society should aim to equalize incomes" and 10 means: "I think a society should **not** aim to equalize incomes" [1, . . . , 10]

F. Instructions: Experiment 2

F.1. Control group: Government Tax

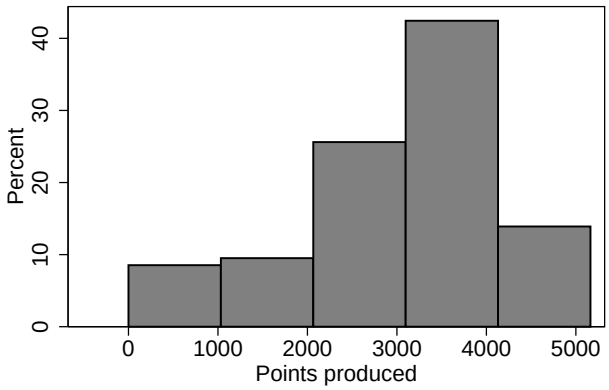
Background

We recruited 810 Americans from an online labor market to do the task you just tested. The task consisted of 30 matrices and the individuals could work for up to two minutes on each matrix (i.e., for up to 60 minutes in total). After each matrix, they were shown how many points they had produced.

Each individual was paid a flat fee of $2. In addition, each individual could earn a bonus. We randomly varied which bonus scheme an individual was offered. The individuals were only informed about their own bonus scheme.

- **Bonus A**: An individual would earn a bonus of **20 cents** for every **100 points** he produced.
- **Bonus B**: An individual would earn a bonus of **20 cents** for every **100 points** he produced, but had to pay a **tax of 50%** on the bonus. The individual was informed that the tax would be transferred to the US federal government for general use.

The figure below shows the variation in points produced for individuals offered **Bonus A**.



Note: The vertical axis indicates the percentage of people who produced points within the range indicated on the horizontal axis.

The individuals offered **Bonus A** produced 3032 points on average.

How did individuals offered Bonus B perform on the task?

What do you believe individuals offered **Bonus B** produced on average?

Individuals offered **Bonus B** produced ☐ points on average.

You will be rewarded a $10 bonus if your answer is within +/- 5% of the actual average production of individuals offered Bonus B.

F.2. Treatment 1: Motivated beliefs (description of prime)

Background

People disagree about the right level of taxes in the US: some favor higher taxes, while others favor lower taxes. A key issue in this debate is how taxes affect people's willingness to work hard.

In this study, we are interested in what Americans believe is the effect of taxes on people's willingness to work hard.[1]

F.3. Treatment 2: Group identification (description of prime)

Background

Political parties disagree about how taxes affect people's willingness to work hard: the Republican Party more often than the Democratic Party claims that taxes discourage people from working hard.

In this study, we are interested in what Americans believe is the effect of taxes on people's willingness to work hard.

F.4. Second-order beliefs

Background

We recruited 810 Americans from an online labor market to do the task you just tested. The task consisted of 30 matrices and the individuals could work for up to two

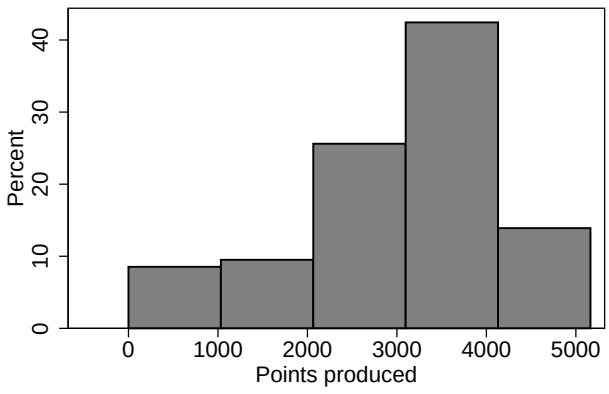
[1] Treatment 1 and Treatment 2 also differed from the control group in that we asked "How did taxes affect performance on the task?" rather than "How did individuals offered Bonus B perform on the task?" when eliciting the beliefs.

minutes on each matrix (i.e., for up to 60 minutes in total). After each matrix, they were shown how many points they had produced.

Each individual was paid a flat fee of $2. In addition, each individual could earn a bonus. We randomly varied which bonus scheme an individual was offered. The individuals were only informed about their own bonus scheme.

- **Bonus A**: An individual would earn a bonus of **20 cents** for every **100 points** he produced.
- **Bonus B**: An individual would earn a bonus of **20 cents** for every **100 points** he produced, but had to pay a **tax of 50%** on the bonus. The individual was informed that the tax would be transferred to the US federal government for general use.

The figure below shows the variation in points produced for individuals offered **Bonus A**.



Note: The vertical axis indicates the percentage of people who produced points within the range indicated on the horizontal axis.

The individuals offered **Bonus A** produced 3032 points on average.

How did Republicans and Democrats believe people performed on the task?

To investigate what Americans believe is the effect of taxes on how people performed on the task, we asked a large sample of Americans to guess how much those offered **Bonus B** produced on average.

These individuals had, like you, tested the assignment for 2 minutes, and were promised a $10 bonus if they guessed correctly how much those offered **Bonus B** produced on average.

Some of these individuals were Republicans and others were Democrats. We now want to ask you whether you think Republicans and Democrats on average had different beliefs about how taxes affect performance on the task.

What did the **Republicans** believe individuals offered **Bonus B** produced?

The Republicans believed individuals offered **Bonus B** produced ☐ points.

What did the **Democrats** believe individuals offered **Bonus B** produced?

The Democrats believed individuals offered **Bonus B** produced ☐ points.

You will be rewarded a $5 bonus for each answer that is within +/- 5% of the actual average response of the Republicans and Democrats, respectively.

F.5. Additional questions

In addition to all the questions from the first experiment, we added the following question to the survey:

- Where would you rate yourself on a scale from 1 to 10, where 1 means "I think the US should increase income taxes to reduce inequality" and 10 means: "I think the US should **not** increase income taxes to reduce inequality"

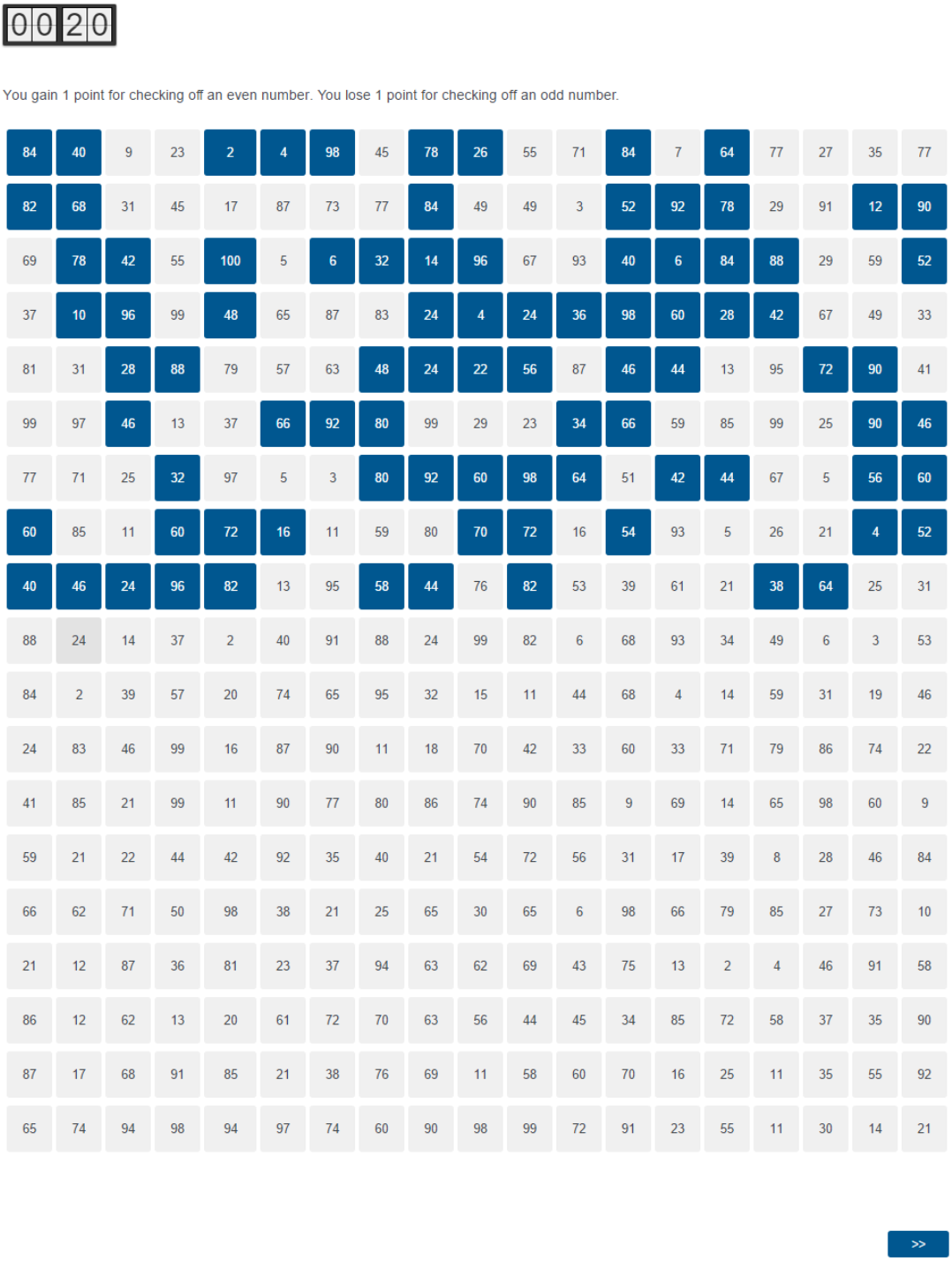


Figure A.7: Example of a matrix from the task