

Give some to get some:
Do citizens understand who benefits from higher taxes?

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Abstract

Do voters understand who benefits from higher taxes? We study this fundamental question for democratic accountability using an incentivized economic game. In four experiments, participants from the US or Singapore earned income and voted for high or low taxes in a society of robot voters. Participants decided the tax rate by majority rule and tax revenues were redistributed equally. We find that even in a stylized economy with a simple redistribution policy, participants' political intuitions about taxes influenced their vote and precluded them from voting in their best interest. Specifically, participants were more opposed to redistribution when it was labeled "taxes" compared to when it was labeled "sharing". In a national sample of Americans, we also find that Republicans opposed high taxes when the game included images and language from modern politics, but they supported taxes the same as Democrats when politics were absent. We discuss implications for liberal democracy.

Introduction

“Nobody likes taxes,” remarked Barack Obama during a presidential debate in 2008. “I would prefer that none of us had to pay taxes, including myself.” But why should we dislike taxes? Taxes fund society. Paying taxes is like investing in your community, insuring your future, and donating to charity. Only a miser would say, “Nobody likes giving to charity,” and tax dollars do more good than many charities. Poor citizens should especially like taxes because they pay the least and benefit the most from government spending. But many poor citizens still oppose taxes and they support cuts to government benefits that help them (Bartels, 2005; Campbell, 2009; Caplan, 2011; McCaffery & Baron, 2006).

Scholars have proposed many answers for why poor citizens dislike taxes, including loyalty to groups that oppose taxes (De La O & Rodden, 2008; Roemer, 1998; Shayo, 2009), distrust in government (Hetherington, 1998; Kuziemko et al., 2015; Rudolph, 2009; Scholz & Lubell, 1998), distrust in fellow citizens (Algan et al., 2016; Rothstein & Uslaner, 2005), complex tax policies (Abeler & Jäger, 2015; McCaffery & Baron, 2006; Mettler, 2011, 2018), racial stereotypes (DeSante, 2013; Gilens, 2009; Roemer et al., 2007), and elite deception (Barton & Piston, 2021). These factors are often correlated and intertwined in contemporary politics making them difficult to disentangle. But if they are the main culprits, then poor citizens should support taxes if we could somehow remove them.

Here we use experimental economics to remove and isolate possible causes of people’s dislike for taxes. In a simple game with real money at stake, participants vote for high or low taxes. We manipulate their income so they are rich or poor each round. We also manipulate whether the policies are called “taxes” or “sharing” to distinguish the political meaning of taxes from their economic effects. Finally, we recruit a national sample to examine opposition to taxes among Democrats and Republicans.

Do Voters Understand Taxes?

Poor citizens benefit the most from taxes because they pay the least and receive the most benefits from the government. This idea animates the classic model of taxation from political economy in which poor citizens support higher taxes in order to redistribute wealth to themselves (Meltzer & Richard, 1981). However, poor citizens do not consistently want more taxes and social spending, and the reasons why have become a central problem in political economy (Anderson, 2006; Feldman, 1982; Kuziemko et al., 2015; Lewis-Beck & Paldam, 2000; Margalit, 2013; Roberts et al., 1994; Sears & Funk, 1990; reviewed in Acemoglu et al. 2015).

For example, a survey in 2017 asked Americans whether cutting taxes was a priority. Theoretically, poor citizens should be less supportive of tax cuts. But people’s support didn’t depend on their income (Figure 1). Instead they were divided along party lines and most Republicans with low income favored the tax cuts.

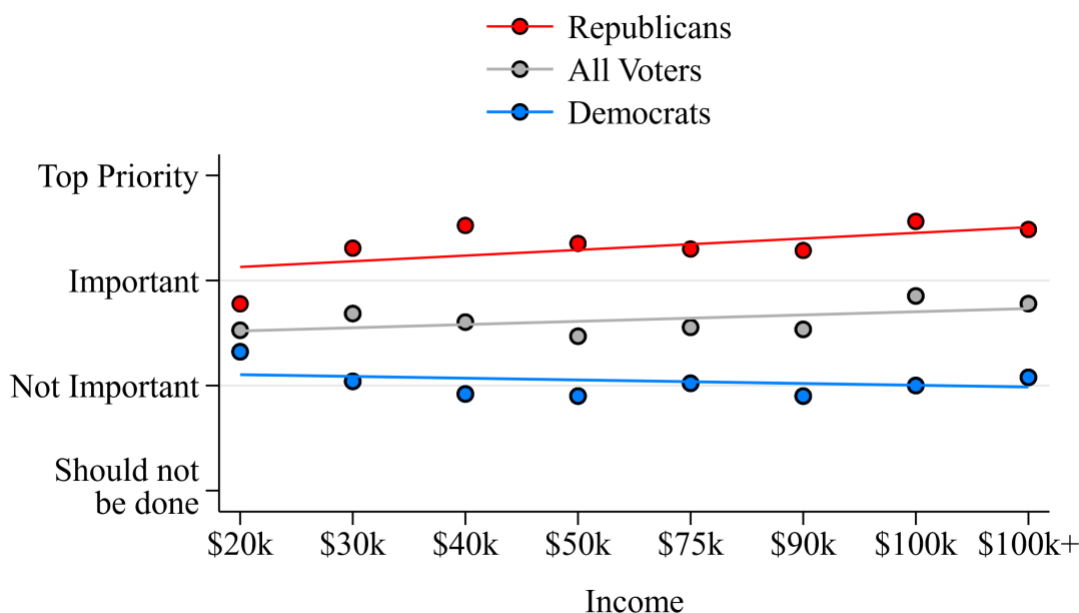


Figure 1. Average support for tax cuts by income and partisanship. Participants answered whether it was a priority to: “Reform the tax code, which may cut taxes for some individuals and corporations.” The data is from a national sample ($N = 1,201$) who completed the Kaiser Family Health Tracking Poll collected November 8–13, 2017, shortly after Congress introduced the Tax Cuts and Jobs Act. The lines are the best fit.

To underscore the puzzle, consider some recent estimates of how much the poor benefit from taxes and social spending. In a Senate hearing about fair taxes, Hodge estimated how much wealth is redistributed by federal taxes and spending in the United States, using 2017 data from the Congressional Budget Office (Hodge 2021). For every dollar they paid in taxes, citizens in the lowest quintile of income received \$68 in direct benefits through programs like Social Security, SNAP, Medicare, and Medicaid. Citizens in the second quintile received \$4.60, the third quintile received \$1.60, the fourth quintile received \$0.71, and the richest quintile received \$0.15 in direct benefits for each dollar they paid in taxes. By these estimates, taxes are clearly a good deal for citizens at the bottom, and they become less beneficial as income rises (counting only direct benefits).

Why then do many poor citizens want less taxes? One explanation is that some citizens compromise with their political party about taxes because they care more about other issues (Groenendyk, 2012). Poor citizens may oppose taxes out of loyalty to their religion (De La O & Rodden, 2008), loyalty to their nation (Shayo, 2009), or because they are otherwise passionate about issues like abortion, gay marriage, gun rights, or immigration (Roemer, 1998; Weeden & Kurzban, 2016). Frank (2007) argued that politicians seeking election often rally support from poor voters by focusing on polarizing social issues. After the election, the same politicians often abandon the social issues and focus instead on cutting taxes and social programs until their next campaign for office.

Poor citizens may also prefer lower taxes if they feel they are being cheated or their money will go to waste. People tend to prefer lower taxes if they suspect their fellow citizens

may cheat the system by not paying taxes or by receiving government benefits they do not need (Algan et al., 2016; Rothstein & Uslaner, 2005). The preference to avoid being cheated is often reinforced by racist stereotypes that paint government beneficiaries as primarily lazy and Black citizens who do not deserve help (DeSante, 2013; Gilens, 2009; Roemer et al., 2007). Similarly, citizens who believe the government is corrupt or wasteful tend to want less taxes (Hetherington, 1998; Kuziemko et al., 2015; Rudolph, 2009; Scholz & Lubell, 1998). Using a case study and a survey experiment, Barton and Piston (2021) show how politicians mislead the poor to dislike taxes on the rich by focusing their rhetoric on the untrustworthiness of government.

Another possibility, however, is that citizens misunderstand who benefits from higher taxes. Citizens may be uncertain about who benefits from taxes because the tax system is complex (McCaffery & Baron, 2006) and because the consequences of many tax policies and social programs are not visible to average citizens (Mettler, 2011, 2018). But beyond policy complexities, it is also possible that citizens misunderstand taxes in more basic ways.

Bartels (2005) argued that people dislike taxes when they focus too much on their own tax burden. Using public opinion data from the 2002 American National Election Studies survey, Bartels examined why most Americans supported the 2001 and 2003 federal tax cuts which mostly benefitted the rich. The author's regression models accounted for people's ideology, partisanship, perceptions about government waste, preferences about government spending, opinions about the tax burdens of the rich and poor, and household income, but found that the strongest predictor of support for cutting taxes was whether people felt their personal tax burden was too high. That is, citizens tended to think myopically about the tax cuts: if they felt their personal tax burden was high, they supported lowering taxes without considering how higher taxes could bring them greater benefits.

If people associate the name "taxes" with their own tax bill, it may explain why they tend to show more support for the same policy by another name (Eckel et al., 2005; Sussman & Olivola, 2011). For instance, participants showed less support for increasing taxes compared to when the same policy was reframed as raising the minimum wage (Lorenz et al. 2017). In another study, Americans, and especially Republicans, showed less support for paying a carbon tax when it was labeled as a "tax" compared to when it was labeled as an "offset" (Hardisty et al. 2010). This finding suggests that Republicans are more hostile toward taxes since the party stresses their burden on citizens.

The Present Experiments

Citizens appear to misunderstand taxes, but questions remain about the sources and depth of this confusion. Observational research is limited by the complexity and confounding of factors such as income, demographics, ideology, and many others. Economic experiments allow us to create a simplified world where we can limit and isolate possible sources of confusion.

We designed a voting game that reduces the problem of taxes to its most basic form. In the game, participants vote for high or low taxes in a virtual society created in an interactive online game with real money on the line. We designed the game to make the effects of the taxes as transparent as possible, deliberately stripping it of any reference to politics. This provides us with a controlled environment to test whether people understand the basic mechanism of redistribution: citizens pay taxes to fund the benefits they receive.

In the game, each participant is a member of a village community with eight other fictional players controlled by the computer (participants know this). This setup allows us to rule out altruistic motives for favoring a policy (Fehr & Fischbacher, 2003; Levine, 1998; Simon, 1993). Each round, players earn high or low income and then see everyone else's income. Then, players vote for lower or higher taxes. After, each participant sees what tax rate will be implemented. Then, they watch while taxes are collected and redistributed equally among the eight players.

If participants with low income oppose higher taxes in this basic game, this points to a deep confusion that does not depend on other complexities. On the other hand, if participants understand taxes, then we can add elements of complexity to see when the confusion arises.

Experiment 1

In this experiment, we test whether people understand who benefits from high taxes. Participants vote for high or low taxes in a virtual society created in the Taxes and Voting game.

In the game, the player starts with 60 health points which deplete due to metabolism by -35 points each round. To improve their health, the player searches for food in a woodland landscape containing five bushes. The player clicks a bush to search for berries, and any berries are added to the player's basket. As a within-subject treatment, participants receive high income (50 berries) or low income (25 berries) each round, which occurs randomly without replacement to yield 5 rounds with each income level.

After searching for food, the player joins the computerized players to vote for lower (20% rate) or higher (60% rate) tax (Figure 2). The computerized players are equally divided between high- and low-income on each round, and they are programmed to vote in their economic interest 100% of the time. Participants read that the other citizens are controlled by the computer to make decisions similar to people. After the votes are tallied, the tax rate that received the most votes is applied to all villagers. Each villager's berries are taxed and collected into a community basket. Then, the berries in the basket are redistributed evenly.\

At the end of each round, players eat the berries in their basket, giving them 1 health point per berry. Afterward, they begin a new round. At the end of 10 rounds, participants completed a short survey. Participants earned a flat payment of 50 cents plus 1 cent per health point at the end of the game. Demonstrations of the game can be played at benjaminjcarter.com/software.

We test the *rational hypothesis*, which predicts that participants with low income will vote for high taxes, against the *myopic hypothesis*, which predicts that participants will oppose high taxes even when they have low income. When people have low income, it might be counterintuitive to favor high taxes because they might not want to give up their earnings. Thus, people may vote for lower taxes because they fail to connect the tax with the personal benefits it would pay for.

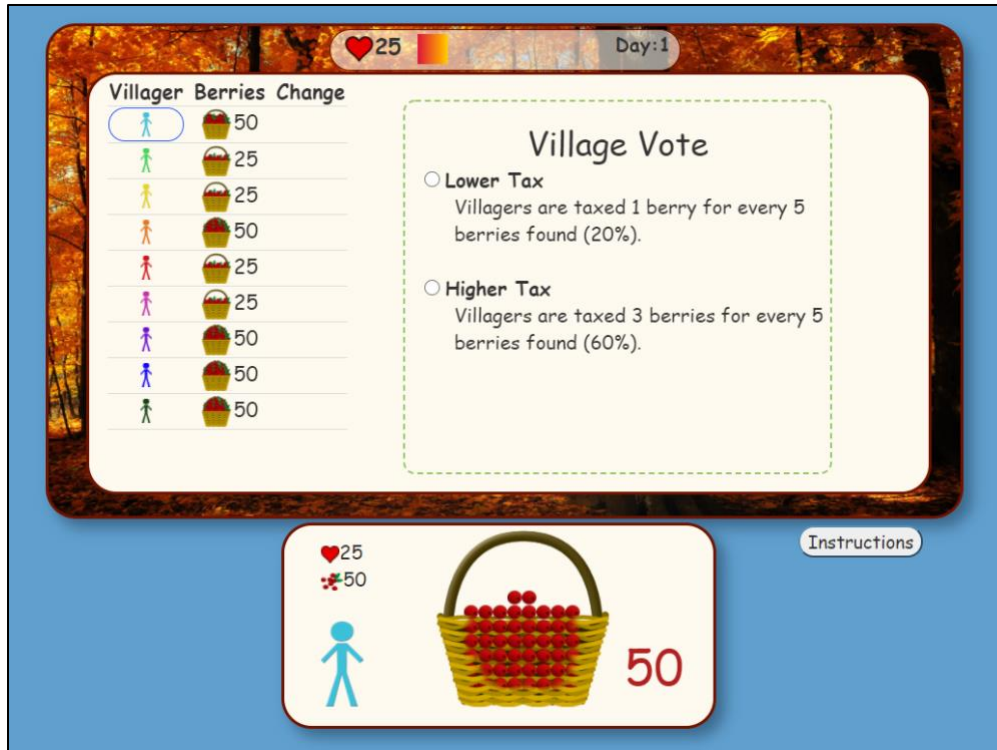


Figure 2. The Taxes and Voting game.

Additionally, as part of the myopic hypothesis, we test whether people support redistribution more when it is labeled as “sharing” instead of “taxes”. Prior research finds that people may dislike the word “taxes” (Hardisty et al., 2010; Lorenz et al., 2017; McCaffery & Baron, 2006). In this study, we test whether people’s dislike for taxes causes them to vote irrationally about redistribution in a simple economy.

Methods. We recruited 160 participants from the United States using Amazon Mechanical Turk (Berinsky et al., 2012) to play the Taxes and Voting game (48% female; age: $M = 35$, $SD = 11$ years). In a between-subject design, we randomly assigned participants to the sharing-label condition or the taxes-label condition. In the sharing-label condition, participants voted for more or less *sharing*. In the taxes-label condition, participants voted for higher or lower *taxes*.

Before playing the game, participants read the instructions (appendix). After the game, participants completed a brief demographic survey. Across conditions, participants earned \$1.44 ($SD = \0.12) on average, including the \$0.50 participation fee.

Results. Figure 3 shows the mean percentage of the time that participants voted for high taxes by the policy label and income. In the sharing condition, participants voted for high taxes more often when they received low income ($M = 77\%$, $SD = 32\%$) than high income ($M = 35\%$, $SD = 37\%$); paired $t(158) = 7.57$, $p < .001$. Likewise, in the taxes condition, participants voted for high taxes more often when they received low income ($M = 51\%$, $SD = 41\%$) than high income ($M = 20\%$, $SD = 27\%$); paired $t(158) = 5.47$, $p < .001$. Thus, participants in both conditions voted for high taxes more often when they had low income, offering some support for the rational hypothesis.

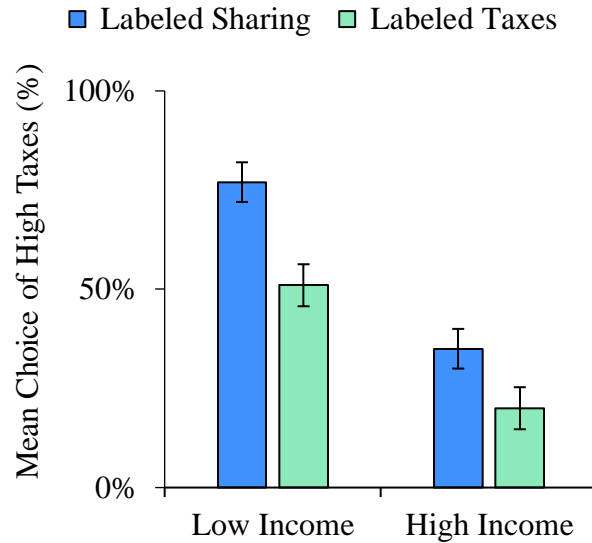


Figure 3. Average vote choice of high taxes by condition and income. Bars are standard errors.

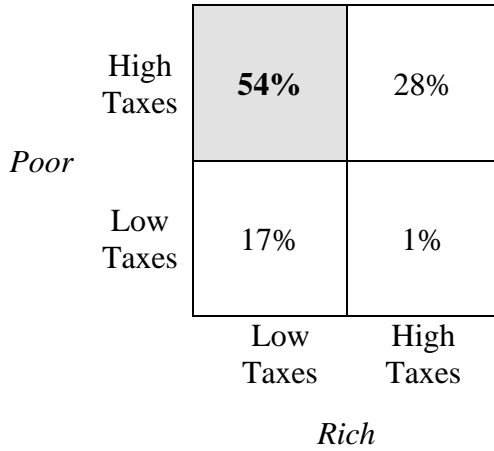
However, if participants were entirely rational, each participant would always vote for high taxes when they have low income and never when they have a high income. Instead, participants with low income voted for high taxes significantly less than 100% of the time in both the sharing condition, $t(79) = 6.34, p < .001$ (one-sample t-test compared to 100%), and the taxes condition, $t(79) = 10.66, p < .001$. This finding indicates that participants voted myopically based on the immediate effects of the taxes rather than the net benefits they would receive.

We also find that participants with high income voted for high taxes significantly more than the rational expectation of 0% in both the sharing condition, $t(79) = 8.49, p < .001$, and the taxes condition, $t(79) = 6.76, p < .001$.

Participants also voted differently depending on how the tax policies were labeled. With low income, participants voted for high taxes more often in the sharing condition (77%) than the taxes condition (51%), $t(158) = 4.44, p < .001$. Likewise, with high income, participants voted for high taxes more often in the sharing condition (35%) than the taxes condition (20%), $t(158) = 2.81, p < .01$. Thus, participants' vote choices depended on whether the tax policy was labeled as “sharing” or “taxes”.

Opportunistic Voting. We look closer at rationality by considering participants' combinations of choices when rich and poor. A rational player would vote opportunistically depending on their income: high taxes with low income and low taxes with high income. Figure 4 shows each participant's votes for high taxes (%) when they had high income (x-axis) and low income (y-axis). Participants who were rational and opportunistic appear in the top-left quadrant of each figure. The moderate percentages (54%, 43%) show that roughly half of the participants voted opportunistically.

A. Labeled Sharing



B. Labeled Taxes

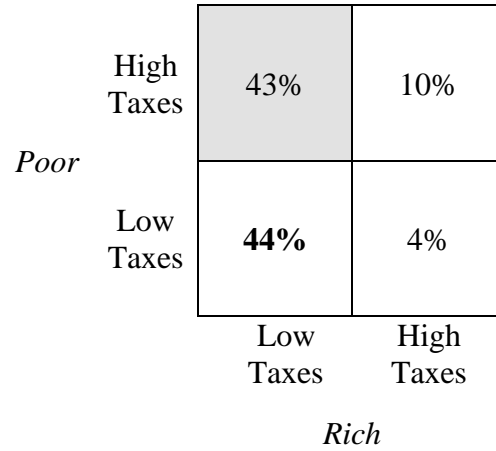
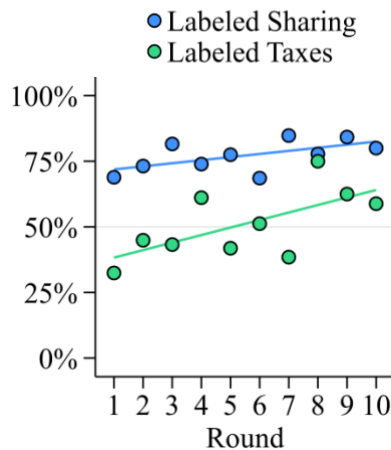


Figure 4. Participants' Votes for High Taxes (%) by income and policy label. The shaded quadrant (top-left) is the percentage of participants who voted rationally and opportunistically.

When the policy was labeled as sharing, the modal strategy was to vote opportunistically. However, when the policy was labeled as taxes, participants were roughly split between the modal strategy of voting for low taxes with both incomes (bottom left quadrant) and voting opportunistically. Thus, labeling the redistribution policy as taxes more than doubled the percentage of participants who voted myopically for low taxes regardless of their incomes, $\chi^2(3, N = 160) = 17.60, p < .01$.

Voting over time. Next, we examine whether participants changed their choices during the game. Figure 5 shows how participants' votes changed over the ten rounds of the game, and Table 1 reports logistic regressions for the effect of time within each condition (by income and the policy label).

A) Low Income



B) High Income

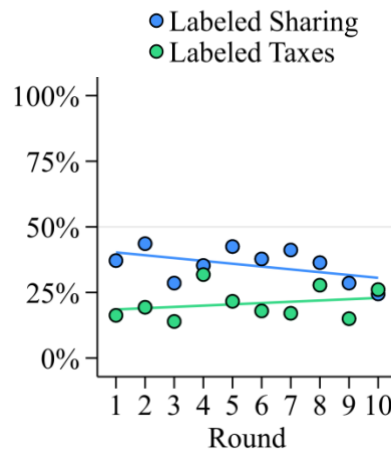


Figure 5. Percentage who voted for high taxes across rounds by income. Lines show the best fit.

Table 1. Logistic regressions for voting for high taxes across rounds

	Labeled Sharing		Labeled Taxes	
	Low Income	High Income	Low Income	High Income
Round	0.14*	-0.17**	0.37**	0.043
	(.063)	(.058)	(.076)	(.053)
Constant	1.80**	-0.26	-1.94**	-2.26**
	(.54)	(.46)	(.62)	(.44)

Note. In all four conditions, there were 80 participants and 400 observations. Each model includes random effects for participants. Standard errors in parentheses. * $p < .05$, ** $p < .01$.

In the sharing condition, participants were more likely to vote rationally as the rounds progressed, meaning they voted for high taxes on low-income days, and vice versa. This finding is consistent with the idea that participants may have learned to vote in their economic interest over time. In the taxes condition, voters with low income were also significantly more likely to vote for high taxes as the rounds progressed. Voters with high income showed no significant trend over time. Their choices were already close to the rational expectation of opposing high taxes.

Discussion. We find that a large minority of participants misunderstood taxes even in a simple environment. Participants were the only human decision-maker and had ten rounds to recognize how to decide in their best interest; the redistribution scheme was presented clearly with simple animations and infographics; there were real financial consequences at stake, since mistakes caused personal financial losses.

Instead, participants' decisions were swayed by an irrelevant factor: how taxes were labeled. The dislike for the label "taxes" was pervasive even in this optimal environment, with support for high tax dropping by 26% between conditions. Overall, roughly half of the participants did not vote opportunistically about taxes as rationality prescribes.

Experiment 2

To examine whether people misunderstand taxes beyond our American sample, we repeated Experiment 1 using a sample of undergraduate students from a university in Singapore. A Singaporean student sample is interesting for several reasons.

Singaporean students consistently top international rankings in education achievements (Deng & Gopinathan, 2016). Thus, they may be better prepared to understand the simple redistribution scheme in the Taxes and Voting game. Also, Singaporean politics is dominated by a single party, so taxes are likely less of a partisan issue compared to in the United States.

However, we could expect that Singaporeans may dislike taxes more than Americans, since Singaporeans enjoy some of the lowest taxes in the developed world (OECD, 2020). Recently, Singaporean officials have argued that Singapore must raise its tax rates to meet

growing demands for public services, to accommodate Singapore’s aging population, and to combat rising inequality (Hsien Loong, 2018; Seow, 2017).

Income inequality is also markedly higher in Singapore than in the United States. In Singapore, the Gini index is 0.76, compared to 0.48 in the U.S. (World Population Review, 2021). Despite the marked income inequality, Singaporeans, like Americans, often oppose new taxes (Bei Yi, 2017). For example, in a 2018 survey conducted by the National University of Singapore’s Institute of Policy Studies, 41% of Singaporeans opposed raising taxes to assist the elderly (compared to 30% who supported more taxes). Instead, participants argued that the Singaporean government should dip into its reserve funds to solve social problems (Gee et al., 2018).

In this experiment, we investigate how students from Singapore vote about taxes using a similar design to Experiment 1, where redistribution was labeled as sharing or taxes. The only difference is that in Experiment 2, participants played the voting task for 6 rounds instead of 10.

Methods. We recruited 185 undergraduate students at a university in Singapore. Participants were recruited from the business school and the general (all majors) subject pools (55% female; age: $M = 21$, $SD = 2$ years).

We paid participants in Singapore Dollars. Participants earned \$5 for participating, as well as 4 cents per health point for their final health in the game. Across conditions, participants earned $M = \$3.32$ ($SD = \$0.29$). The study took about 10 minutes to complete.

Results. Participants in the sharing condition voted for high taxes more often when they received low income ($M = 81\%$, $SD = 32\%$) than high income ($M = 23\%$, $SD = 26\%$); paired $t(178) = 13.43$, $p < .001$, providing support for the rational hypothesis (Figure 6). This was also true for participants in the taxes condition, where participants voted for high taxes more often when they received low income ($M = 67\%$, $SD = 36\%$) than high income ($M = 19\%$, $SD = 26\%$); paired $t(188) = 10.66$, $p < .001$. Thus, participants showed sensitivity to their income which helped them vote rationally about taxes.

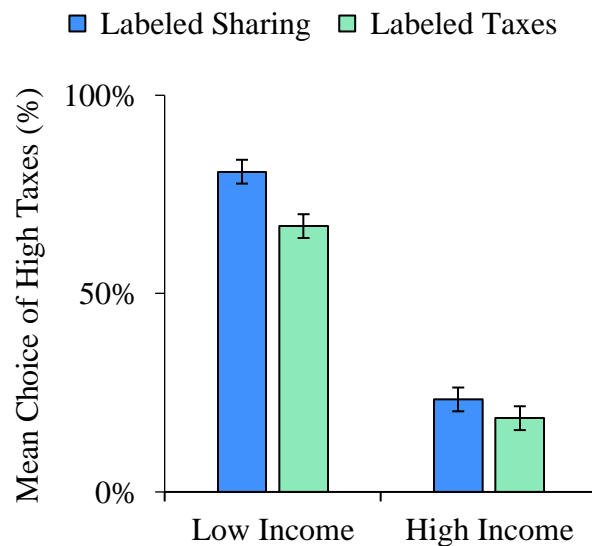


Figure 6. Average vote choice of high taxes by condition and income. Bars are standard errors.

Participants also voted differently depending on how the tax policies were labeled. With low income, participants voted rationally for high taxes more often when the policy was labeled sharing (81%) compared to when it was labeled as taxes (67%), $t(183) = 2.73, p < .01$. This result is similar to the US sample: participants with low income earned less money by voting myopically for lower taxes when the policy was labeled as taxes. With high income, however, participants voted for high taxes about the same in the sharing condition (23%) and the taxes condition (19%), $t(183) = 1.26, p = .21$.

Opportunistic Voting. In our Singapore sample, the modal choice was to vote opportunistically regardless of whether the tax policy was labeled as sharing (48%) or taxes (55%). Similar to in the US sample, roughly half of our Singaporean participants voted opportunistically as predicted by rational models. Unlike in the US sample, however, opportunism did not vary significantly between conditions, $\chi^2(3, N = 185) = 4.87, p = .18$.

Voting over time. Next, we look at voting trends over time (Table 2). We find that on low-income days, participants gradually voted in their best interest over time regardless of how redistribution was labeled (first and third columns of Table 2). On high-income days, participants in the sharing condition voted for low taxes more as rounds went on, whereas we see no change in the taxes condition.

On high-income rounds, we see the opposite pattern. In the sharing condition, in the first period participants chose more sharing 44% of the time, but this rate steeply declined over time, reaching 5% (almost perfect rationality) in the final period. In the taxes condition, however, participants chose high taxes at approximately the same rate, which hovered around 20% for the entire duration of the task.

Table 2. Logistic regressions for voting for high taxes across rounds

	Labeled Sharing		Labeled Taxes	
	Low Income	High Income	Low Income	High Income
Round	0.31*	-0.06**	0.47**	0.03
	(.15)	(.01)	(.11)	(.10)
Constant	2.27**	-0.44**	-0.34	-1.84**
	(.77)	(.06)	(.47)	(.44)

Note. Logistic regression with random effect for participant. Standard errors in parentheses. There were 90 participants in the sharing condition and 95 participants in the taxes condition. Each participant had 3 low-income and 3 high-income days. ** $p < .01$, * $p < .05$.

Discussion. We find that roughly half of our sample of Singaporean university students voted for taxes rationally and opportunistically, similar to our American sample. Participants also showed a dislike for the label “taxes” on rounds when they had low income. However, they partly overcame their dislike for taxes over the course of six rounds, and the labels did not cause them to vote differently on high-income rounds. Thus, we conclude that misunderstanding taxes

is not exclusive to American MTurkers, though Singaporean students may be affected less by the label “taxes”.

Experiment 3

In Experiment 3, we examine a scenario where voters earn low income all 10 rounds of the game. In the previous experiments, participants had equal chances of earning a high income or low income each round. However, most citizens' incomes change gradually over time, so participants may have been unaccustomed to judging taxes based on fluctuating incomes.

In this experiment, we make the problem simpler: Participants received low income every round. Thus, participants always earned the most money by voting for high taxes. Also, participants had more rounds with low income to appreciate the benefits of high taxes. In this simpler game, we provide another test of whether participants understand the benefits of taxes and whether labeling the policy as “taxes” makes it more difficult to understand.

Methods. We recruited participants ($n = 160$; 47% female; age: $M = 36$; $SD = 10$ years) to complete a short study on Amazon’s Mechanical Turk (<20 min). Participants played the taxes game with the same procedures as before. Participants’ earnings from the game were $M = \$1.10$; $SD = \$0.11$ in addition to 50 cents for completing the study, for a total of ~ \$1.60 on average.

We assigned participants to the taxes label or the sharing label in a between-subject design. In both conditions, participants received low income (25 cents) all ten rounds of the game. Also, since participants always receive the same income, we added randomness to the other villagers’ decisions to ensure that participants would see both policies enacted across rounds. Specifically, the computerized villagers voted in their own interest 90% of the time, which means that the participant’s choice was decisive roughly half the time. This way, even if a participant votes for low taxes every round, they would still sometimes see the effects of high taxes, giving them opportunities to discern what tax policy is in their best economic interest.

Results. The rational prediction is that participants should vote for high taxes 100% of the time because they always receive low income. However, Figure 8 shows that participants voted for high taxes significantly less than 100% both when labeled as taxes ($M = 58\%$, $SD = 34.5\%$), $t(79) = 6.84$, $p < .001$, and when labeled as sharing ($M = 80\%$; $SD = 26.3\%$), $t(79) = 12.05$, $p < .001$. We also find participants voted for high taxes less when they were labeled taxes compared to sharing, $t(158) = 4.46$, $p < .001$.

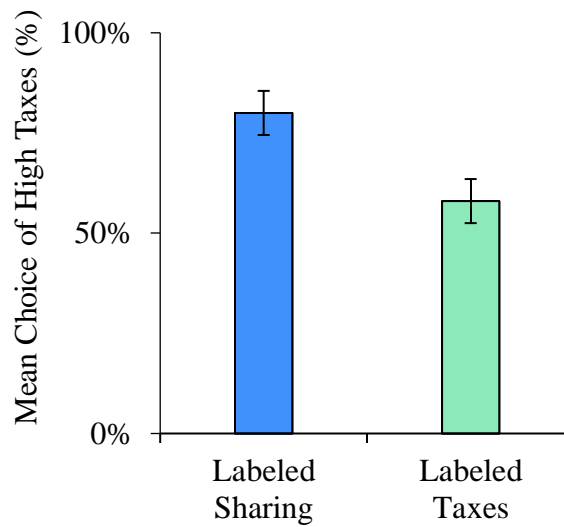


Figure 8. Average percentage of votes for high taxes by policy label when participants’ incomes are low for all ten rounds. Bars are standard errors.

Voting over time. In both conditions, participants voted for higher taxes as the game progressed (Table 3). One possibility is that the label “taxes” makes the policy less intuitive for participants in earlier rounds compared to “sharing”. We test this possibility in the third column in Table 3 and find that participants improved more as the game progressed when the policy was labeled taxes.

Table 3. Logistic regressions of voting for higher taxes.

	Sharing Label	Taxes Label	Combined
Day	0.22 ** (0.04)	0.40 ** (0.06)	0.23 ** (0.04)
Taxes Label			-2.89 ** (0.54)
Taxes Label * Day			0.17** (0.06)
Constant	1.18 ** (0.35)	-1.64 ** (0.40)	1.30** (0.37)

Note. The sharing label and taxes label contain 80 participants and 800 observations each. The combined model combines both conditions. Each model includes a random effect for participant. Standard errors are in parentheses. ** $p < .01$, * $p < .05$

Discussion. We find that Americans still misunderstand taxes when their income is held constant across ten rounds. Participants with constant incomes voted rationally for high taxes at similar rates to earlier experiments where the incomes were mixed. And, labeling the policy “taxes” still reduced support for high taxes by 22% relative to when the policy was labeled “sharing”.

Experiment 4

People’s partisanship might help them vote in their best interest or it may lead them astray. In this experiment, we test whether people’s partisanship hampers their understanding of how taxes can benefit them (e.g., Bartels, 2005). To examine how people vote about partisan tax policies, we designed a voting game identical to Experiment 1 except the tax policies are associated with political parties (Figure 9).

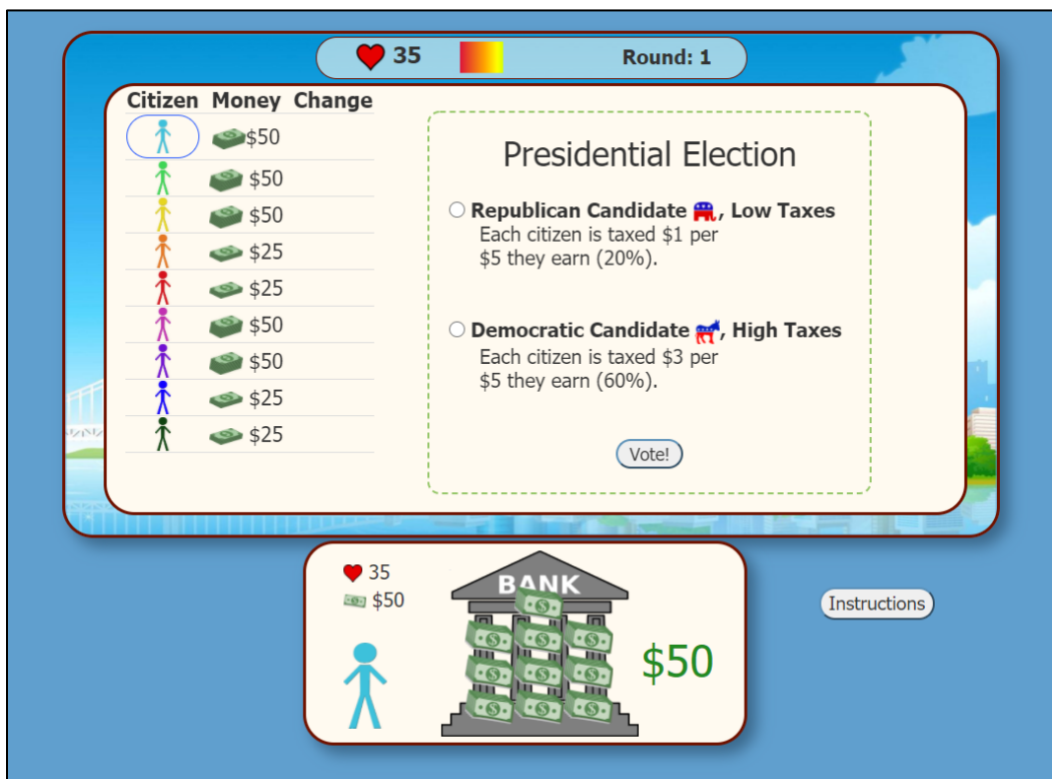


Figure 9. The Political Taxes and Voting game.

In the experiment, participants played either the political game or the neutral game used in earlier studies. We test whether partisans vote differently about taxes when the policy is political. Specifically, we hypothesize that Democrats should choose high taxes more often than Republicans when the theme is American politics. Although participants in both games could earn the same amount of cash by voting rationally, the partisanship hypothesis predicts that Democrats with high income will vote less rationally than Republicans, and Republicans with low income will vote less rationally than Democrats.

Methods. We recruited a national sample of American Democrats ($n = 429$) and Republicans ($n = 478$; 47% female; $M = 48$ years, $SD = 36$) between October and December

2020 using the survey firm Qualtrics. Before playing the 10-round game, participants identified as Democrats or Republicans (87 pure independents were dismissed). After the game, participants indicated who they planned to vote (or who they voted for) in the presidential election. Otherwise, the procedures were the same as in the previous experiments.

In this experiment, participants were randomly assigned to the neutral condition as villagers in a forest or the political condition as American citizens. The neutral condition was the same as the sharing condition in Experiment 1.

In the political condition, the players are citizens of the United States who look for jobs to earn income in an American city. Players earn income and receive benefits in cash, which they spend to increase their health. Each round, players vote for presidential candidates who propose different tax rates. The Republican candidate proposes low taxes, where players pay \$1 for every \$5 in income (20%), and the Democratic candidate proposes high taxes, where players pay \$3 for every \$5 in income (60%). After collecting taxes, the government distributes the money equally among the citizens.

Results. *Were Republicans more opposed to taxes than Democrats?* Figure 10 shows the mean percentage of participants that voted for high taxes.

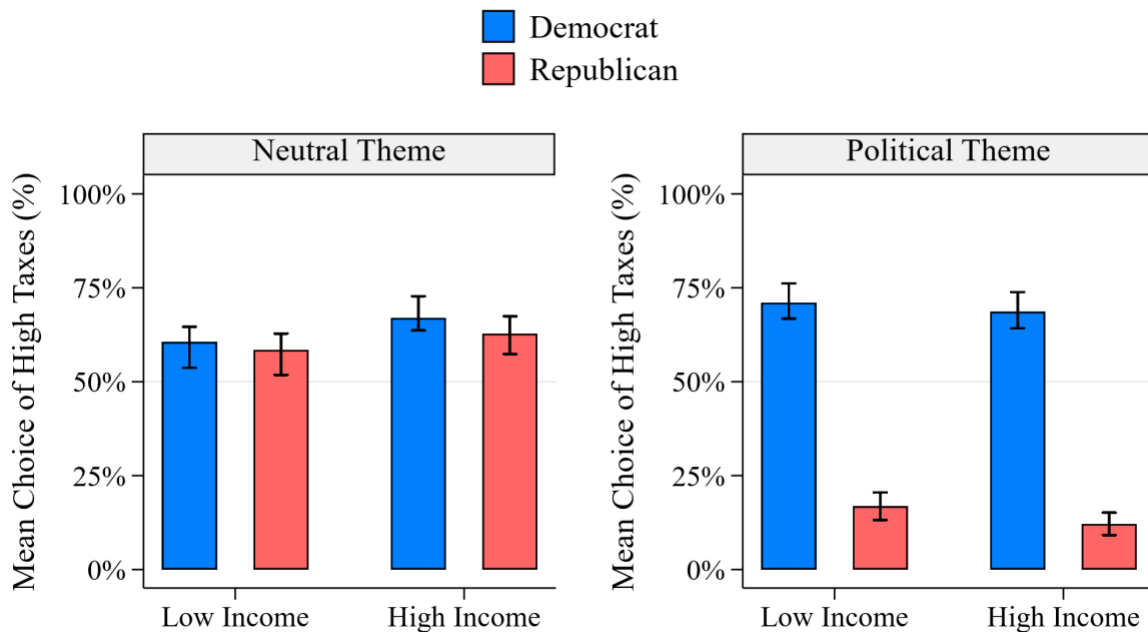


Figure 10. Mean percentage of votes for high taxes by partisanship, theme, and income. The error bars indicate standard errors.

In the neutral game, Republicans and Democrats voted for high taxes with similar frequencies on average both with low income $t(409) = 0.57, p = .56$, and with high income $t(409) = 1.29, p = .20$. However, when the same policy was political, Republicans were less likely to vote for high taxes than Democrats, both with low income, $t(464) = 17.87, p < .001$, and with high income, $t(464) = 19.60, p < .001$. These results support the partisanship hypothesis.

Democrats and Republicans voted similarly for high taxes without politics, but when the same policy was political, Democrats voted for high taxes much more than Republicans, whose support dropped considerably.

Were Democrats rational? With low income, Democrats voted for high taxes less often than the rational expectation of 100% in the neutral game and the political game (one-sample t-tests compared to 100%, all $ps < .001$). Thus, even Democrats voted for high taxes less often than a rational player would, and they earned less money as a result. With high income, Democrats voted for high taxes much more often than the rational expectation of 0%, voting against their interests two-thirds of the time in both conditions (one-sample t-tests compared to 0%, all $ps < .001$). These Democrats seem to have voted generously to help others, even though they knew the other players were not real people.

Comparing across themes, with low income, Democrats voted for high taxes more in the political game than the neutral game, $t(446) = 3.03, p < .01$. With high income, Democrats' votes didn't differ between the neutral and political game, $t(446) = 0.51, p = .61$.

Were Republicans rational? With low income, Republicans voted for high taxes less often than the rational expectation of 100% in the neutral game and the political game (all $ps < .001$). They voted rationally 58% of the time in the neutral game and only 17% of the time in the political game. With high income, even Republicans voted for high taxes more often than the rational expectation of 0% in both the neutral and political game (all $ps < .001$). In the neutral game, they chose high taxes most of the time, appearing to show the same misplaced generosity as Democrats. In the political game, Republicans became considerably more rational with only 17% voting for high taxes against their interests, though still greater than 0%.

Comparing across themes, Republicans voted for high taxes less in the political game than the neutral game, both when they had low income $t(427) = 13.20, p < .001$ and high income $t(427) = 18.30, p < .001$.

Altogether, Democrats and Republicans both strayed far from rational voting. With low income, Republicans in the political game were the least rational: They voted against high taxes, which meant less money for themselves, nearly 90% of the time. With high income, the majority from both parties voted for high taxes against their interests, except Republicans in the political game whose support for high taxes dropped to 17%. Thus, both groups appear to deeply misunderstand who benefits from high taxes even in a simplified game.

Opportunistic Voting. We look closer at rationality by considering participants' combinations of choices when rich and poor. A rational player would vote opportunistically depending on their income: high taxes with low income and low taxes with high income.

Figure 11 shows each participant's votes for high taxes (%) when they had high income (x-axis) and low income (y-axis). Participants who were rational and opportunistic appear in the top left quadrant of each figure. The small percentages (~10%) show that few participants voted opportunistically.

A. Neutral Theme

B. Political Theme

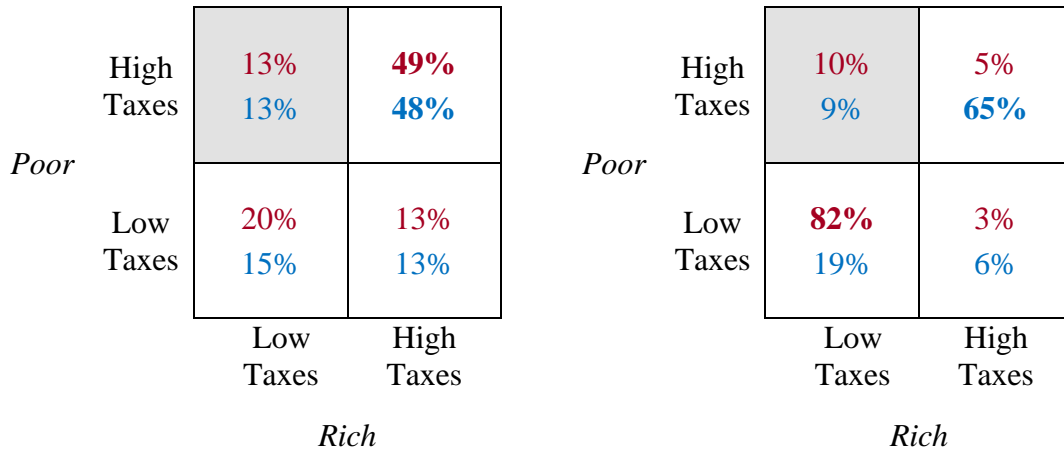


Figure 11. Participants’ Votes for high taxes (%) by income, theme, and partisanship (Republicans in red, Democrats in blue). The shaded quadrant (top-left) is the percentage of participants who voted rationally and opportunistically.

In the neutral game, the modal choice in both parties was to vote for high taxes with high income and low income (top right quadrant). In the political game, Democrats and Republicans diverge. Most Democrats voted for high taxes with both incomes as before but more so, $\chi^2(3, N = 448) = 31.24, p < .01$. But 82% of Republicans voted for low taxes with both incomes (bottom left quadrant), opposite their mode in the neutral game, and opposite from Democrats.

Voting over time. We also examine whether participants voted differently as they gained experience. Table 4 shows logistic regressions of voting for high taxes for each group and condition across the ten rounds of the game. Figure 12 shows these trends graphically.

Table 4. Logistic regressions of votes for high taxes across rounds

	Low Income		High Income	
	Neutral	Political	Neutral	Political
<i>Democrat</i>				
Round	0.02 (.031)	-0.02 (.035)	-.050 (.029)	-0.02 (.035)
Constant	0.70** (.252)	2.30** (.347)	1.35** (.225)	2.08** (.346)
<i>Republican</i>				
Round	-0.04 (.031)	0.10* (.041)	-0.13** (.032)	0.07 (.042)
Constant	0.83** (.256)	-4.04** (.456)	1.60** (.261)	-3.87** (.421)

Note. Models include random effects for participants. Standard errors in parentheses. ** $p < .01$, * $p < .05$

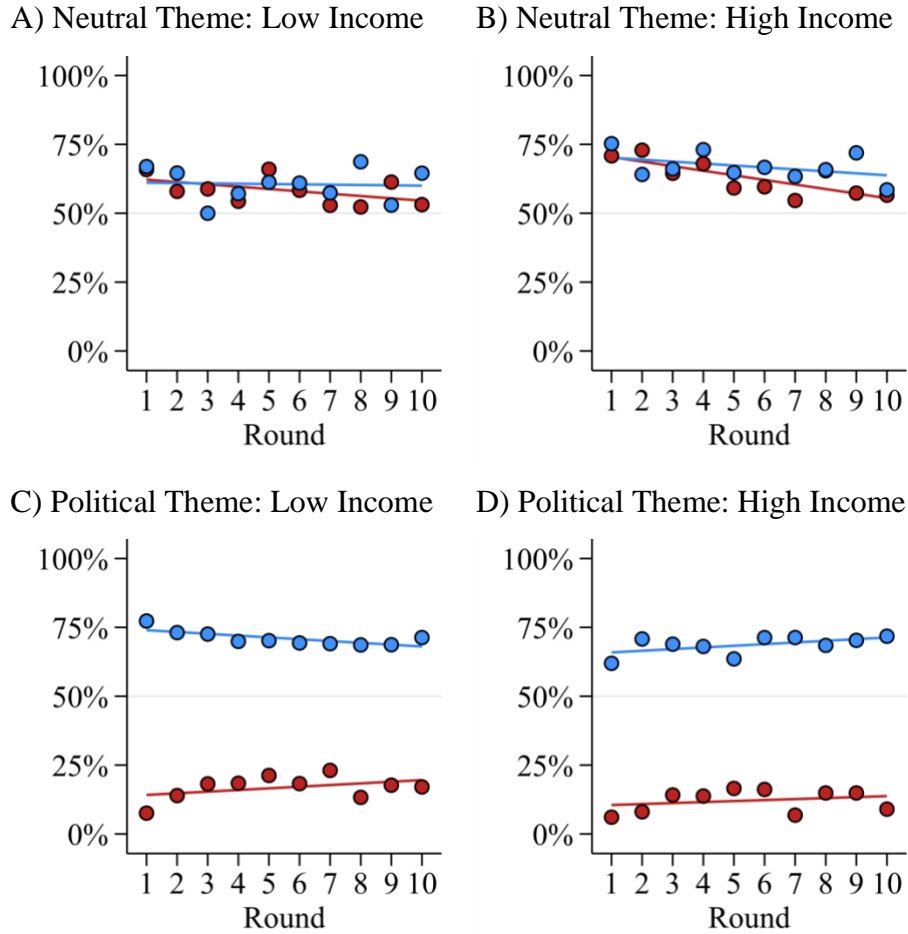


Figure 12. Percentage of participants who voted for high taxes (y-axis) across rounds by income and condition. Republicans are in red and Democrats are in blue. The lines are the line of best fit.

Among Democrats, we find no evidence of an improvement over time. Among Republicans, participants in the neutral game progressively voted less often for high taxes when they had high income, becoming slightly more rational. Republicans in the political game gradually voted more often for low taxes when they had low income, as rationality prescribes. Even so, improvements in rationality were small, and most participants did not vote in their own interest even after playing more rounds of the game

Discussion. Using a national sample of Democrats and Republicans, we find that political language polarized participants' votes. Republicans preferred lower taxes than Democrats when the tax policy was couched in partisan imagery and political language. However, when the same policy was stripped of political content, we find that Democrats and Republicans supported high taxes at similar rates.

General Discussion

In four experiments with participants from the United States (including a national sample) and Singapore, we find that participants often failed to discern that high taxes can benefit them in a simple game where they were the only human in a fictional economy. Two

seemingly irrelevant factors underlie participants' systematic error: how taxes were labeled and whether resources were redistributed in a political context.

In Experiment 1, participants earned high income half of the time and low income the rest of the time. We find that when they had low income, U.S. participants voted rationally for high taxes 26% less when the policy was labeled as "taxes" compared to when it was labeled as "sharing". Moreover, only about half of the participants changed their vote opportunistically based on their income as prescribed by rationality. We find similar results in Experiment 2 with undergraduates from a university in Singapore, supporting the idea that people outside of the United States may also fail to recognize the benefits of taxes.

In Experiment 3, participants from the U.S. earned a low income for all ten rounds of the game. We find that 42% of participants failed to vote for high taxes when the policy was labeled as "taxes" compared to 20% of participants when the same policy was labeled as "sharing". These results indicate that participants can be swayed by tax labels even after removing income fluctuations.

In Experiment 4, we find that in a nationally representative sample of Americans, partisanship hampered participants' understanding of when they benefit from higher taxes. Democrats and Republicans voted the same as one another about redistribution when politics was absent. Yet, they voted very differently when the taxes were politicized: Republicans' support for high taxes dropped dramatically when the Democratic party backed the tax proposal.

Taken together, these findings indicate that many people may fail to understand which tax policy advances their best interest. These results contradict rational models of voting on redistribution (Meltzer & Richard, 1981) and echo prior research that warns about the dark side of heuristics in public policy (Dancey & Sheagley, 2013). In particular, the present experiments highlight two heuristics through which Americans get sidetracked from supporting tax policies that work in their own interest. One is their intuitive dislike for the label "taxes" (a sentiment that they share with Singaporeans); the other one is partisan cues.

The finding that the label "taxes" affected participants' voting raises worries about citizens' ability to vote for representatives that pursue their best interest. Compared to previous research (Hardisty et al., 2010; Lorenz et al., 2017; Sussman & Olivola, 2011), taxes in the present experiments were strikingly simple. A single tax rate, a single source of income, intuitive infographics, clear monetary stakes, and repetition provided for an ideal environment to vote rationally. Even so, contrary to previous findings (Paetzel et al., 2018), participants still allowed their aversion to the label "taxes" to stand in the way of benefiting from redistribution.

These worries are magnified when we consider how partisanship affected participants' vote. Contrary to the conventional wisdom that political cues can help voters make better decisions (Downs, 1957; Hinich & Munger, 1996; Lau & Redlawsk, 2001, 2006; Popkin, 1991; Sniderman et al., 1991), participants voted against their own interest when a political cue was available. Associating higher taxes with the Democratic party was sufficient to reduce low-income Republicans' support to vote for high taxes compared to when the tax was not politicized. Thus, the present research points to the potency of expressive partisanship (Huddy et al., 2015b, 2018): participants used a partisan cue even in a context where the cue did not add any relevant information about the tax policy and instead misled them.

Participants' vote choices on taxes were not only easily swayed by seemingly irrelevant factors. Most worrying, participants' choices did not become consistently more rational as they gained more experience with the game. Irrational voting persisted especially in the national sample of Americans, whereas students from Singapore were better at learning from previous mistakes despite playing a shorter game.

Overall, these results raise troubling questions about democratic accountability. If people could not discern what benefits them in a highly simplified environment, how can we expect them to navigate complex policies and choose the politicians that will best advance their interests? This question evokes longstanding discussion in political science about voter discernment (A. Campbell et al., 1960; Converse, 1964) and the role of political parties (Aldrich, 1995; Schattschneider, 1960). The present experiments paint a worrisome picture: Voters in America -and, perhaps, beyond- can be vulnerable to their own biases that prevent them from voting in their best interest as well as to potential manipulation by political rhetoric.

At the same time, the present research may offer a tool to ameliorate people's difficulties in understanding taxes and what they gain from them. By using virtual environments with real money on the line such as the Taxes and Voting game, researchers can uncover the psychological obstacles that preclude low-income Americans from voting for greater redistribution. Future research can use virtual environments to study ways to de-bias participants and help them choose the tax policies that benefit them. Low-income voters who can connect taxes with the benefits they fund can be a potent force for reducing inequality in democratic societies.

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