

Are We in the Same Boat or Not? The Opposite
Effects of Absolute and Relative Income Shifts on
Redistributive Preferences

SUPPORTING INFORMATION

A.1 Descriptive Statistics

There was considerable variation in the tax rates chosen by subjects across the twenty sessions. The median tax rate chosen was 35%, with the lower and upper quartile marks at 15% and 62%, respectively. Table A shows the sample size for each treatment condition, along with the median tax rate chosen. As can be seen, the median tax rate chosen differed considerably between treatments, ranging from a low of 25% in the *POUM* condition, to a high of 50% in both the *PODM* and *Upturn* conditions.

Table A: Treatment Conditions

Treatment	Subjects	Rounds	Observations	Median Tax (%)
Control	70	10	700	35
Static	30	10	300	33
Upturn	30	10	300	50
POUM	20	10	200	25
Downturn	30	10	300	30
PODM	20	10	200	50

Table B presents definitions and descriptive statistics for all variables used in the main analysis.

Table B: Detailed Descriptive Statistics

Variable	Operationalization	N	Min	Max	Mean	Median	SD	NAs
Observation-level								
Tax	Tax voted for (%)	2000	0.0	100.0	41.05	35.0	28.9	0
Ranking	Ranking from 1st task (Ordinal)	2000	1.0	5.0	3.00	3.0	1.4	0
Subject-level								
Average Tax	Average Tax Voted for Across 10 Rounds (%)	200	4.5	87.4	41.05	40.6	17.0	0
Average Ranking	Average Ranking Across 10 Rounds (%)	200	1.3	5.0	3.00	3.0	0.9	0
Female	Female? (Yes/No)	200	0.0	1.0	0.47	0.0	0.5	0
Family Income	Survey question: What is your family's annual income? (Ordinal)	200	1.0	9.0	7.27	8.0	2.3	11
Republican	Survey Question: Generally speaking, do you usually think of yourself as a Republican, a Democrat, an Independent, or what? (Ordinal)	200	-3.0	3.0	0.04	0.0	2.0	0
Conservatism	Survey question: Here is a 7-point scale on which the political views that people might hold are arranged from extremely liberal to extremely conservative. Where would you place yourself on this scale? (Ordinal)	200	-3.0	3.0	-0.23	-1.0	1.8	0

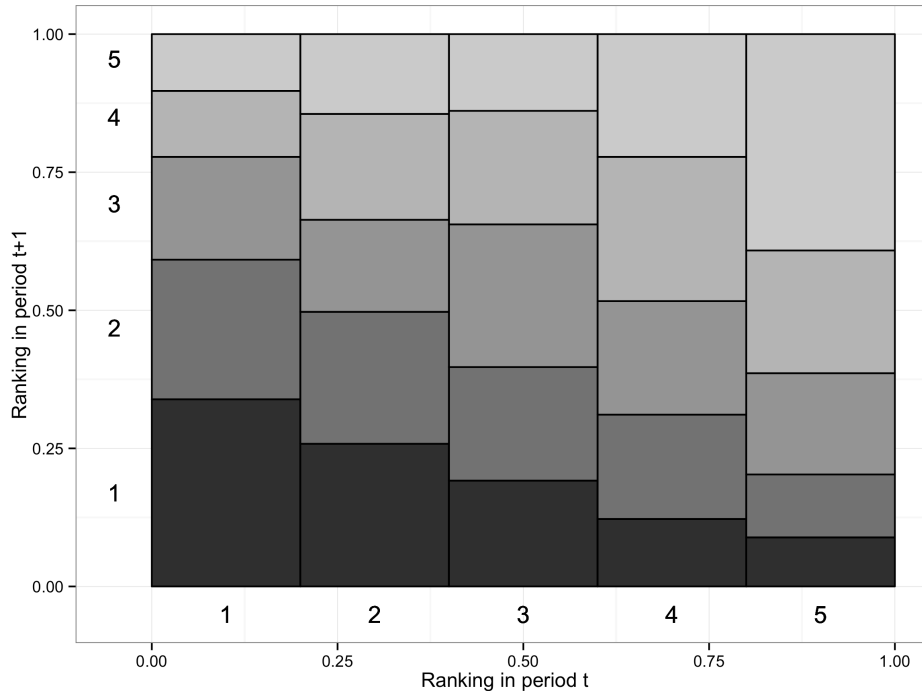
A.1.1 Within Subject Variation

Since each session consists of 10 rounds of the game, each subject contributes 10 observations to the analysis. Given this nested design, a salient concern is the extent to which idiosyncratic individual-level factors affect the behavior of subjects in the experiment. Even though we take care to account for the nested design of the experiment in our analysis, it is useful to decompose the results of the experiment and examine to what extent individuals are responsive to the incentives of the game.

An important component of the experimental design involves introducing uncertainty about future income, such that when subjects vote on their preferred tax rate, they do not have full information on where they will fall in the final income distribution. At the same time, it is important that income is earned and not randomly determined. We use the two-period “slider task” to accomplish these goals.

To get a sense of whether the game works as intended, we analyze the rankings of subjects across the ten rounds and to what extent performance in one round is predictive of performance in another round. To illustrate the persistence of rankings across rounds, figure A shows how rankings change from one period to another. The x-axis shows subject ranks in any given period t , while the y-axis shows how the same subject ranks in the next period. If the rankings across rounds was random, we would expect that each subject would shift with equal probability to the five possible rankings at $t+1$, while if rankings across rounds were completely determined, we would expect subjects to always achieve the same ranking in any two periods.

Figure A: Rank Persistence

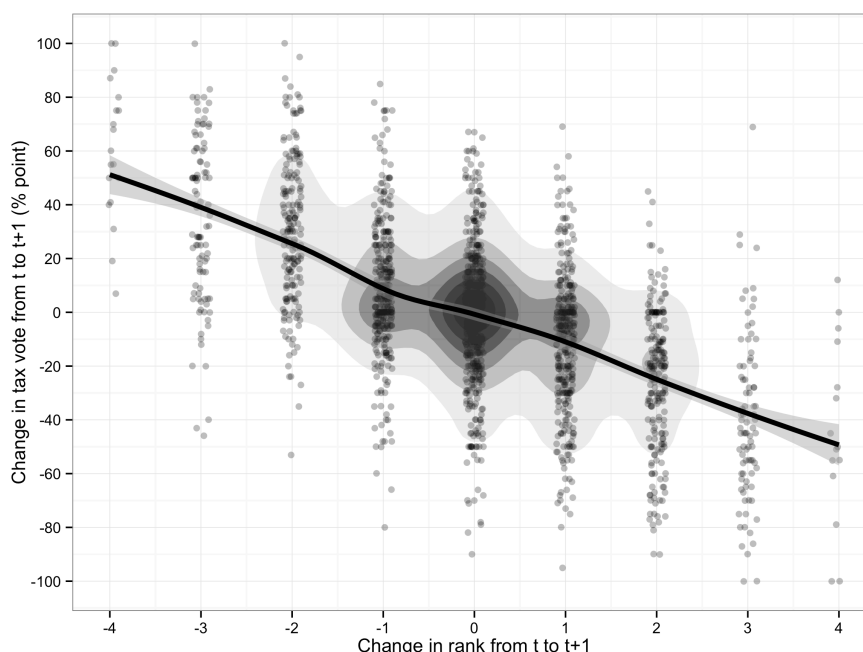


The figure suggests that there is some persistence across rounds, but that there is considerable variation in rankings. For example, subjects who attain the highest rank in period t , have a 34% probability of maintaining that rank at $t+1$, a 60% probability of staying in the top two ranks, and a 20% probability of ending up in the bottom two ranks.

There is, thus, considerable variation across any two periods, suggesting that subjects should not learn their place in the income distribution with any certainty as the game progresses and that there is a nontrivial probability of ending up on the other end of the income distribution across any two periods.

Another factor that might play a role are predetermined ideas about the proper level of taxation in society. As such, some individuals might not be responsive to the monetary incentives of the game and vote in consistent fashion across the rounds of the game. To gauge whether this is the case, figure B shows how tax choice changes from one period to another as rank changes. The x -axis shows changes in rank from period t to $t+1$ for all subjects and all time periods (excluding the 10th period, since there is no round 11), while the y -axis shows corresponding changes in tax vote choice. If subjects always voted in the same fashion, there should be no relationship between the two variables.

Figure B: Changes in Rank and Tax Choice Across Periods



Note: Points are slightly jittered for clarity. The line is a superimposed loess curve, while the polygons show the density of the data points.

The figure clearly suggests that there is a robust relationship between the two variables, with subjects who achieve a lower rank in a given period tending to vote for a higher tax rate than in the previous period (and vice versa). The superimposed density plot suggests that a plurality of subjects did not change ranks across any given two periods and that, on average, they did not change their tax vote during the same two periods. This is to be expected, since the monetary incentives remained constant. However, as the outer points on the figure show, subjects responded strongly to changes in rankings across rounds. For example, all of the subjects who dropped by 4 ranks (from 1st to 5th) voted for a higher tax rate in the subsequent round. Likewise, nearly all of the subjects who rose by 4 ranks (From 5th to 1st) voted for a lower tax rate in the subsequent round. This suggests that the results of the experiment are not driven by idiosyncratic individual level factors, but that the monetary incentives of the game worked as expected.

A.2 Handout from Experiment for Two Period Treatments

Thank you all for coming and agreeing to participate in our study. This study entails two parts: a small game and a short survey. Together, your participation should take no longer than 15-20 minutes. In return for your participation, beyond receiving extra credit, you will also all be provided with a \$5 show up fee, and you will keep your monetary payoff from one of the rounds of the game, which will on average add up to an extra \$5 reward. The extra reward will be no lower than \$1 and no higher than \$15, so if you follow the instructions carefully and make good decisions you may earn considerably more than the average reward.

In front of you, on the computer screen, you should see the welcome screen to the game. Let me know if that is not up on your screen right now. Each one of you has been assigned a number. This is your identification for this game, created in order to facilitate our processing of the data and provide you with your correct payoff. While there are 10 of you here, you will be playing in games of 5 participants. However, each round of the game, we are going to randomly select the two groups, and you will not be told with whom you are playing. This means that for each round, you may be playing with a different set of 4 players. But as far as each of you is concerned, the game will proceed in the same fashion, only that the people you are playing with might change in each new round – though there is no way for you to know that, since you will not know exactly who you are playing with. Is that part understood?

When playing the game, I also ask that you please refrain from talking to each other, as this game is supposed to be played alone. A failure to do may result in your monetary payment for the session being reduced.

The game will proceed as follows. There are 10 rounds in the game itself. You will perform a task (twice) in each round for 30 seconds (each).¹ After you perform it (once), you will find out what your score was and what your payoff in dollars is for that task. Now, the payoffs are fixed. So the best performer of the task will receive the highest payoff, and the 2nd best performer will receive the 2nd highest payoff, and so forth. You are essentially competing for a higher position. This will become clear as you play the game. The reverse side of this handout has a screenshot of the task that you play – the so called “slider task”.² The purpose is to move as many of these sliders to the middle of the line, to the 50 mark, to gain points for that task. The points get added up for each task and then determine your monetary payoff for that task.

After you performed the task (once, and before you perform it again), you will be asked to vote for the share of payoffs that should be put in a group fund and allocated equally to all five participants, irrespective of their performance in the task. The chosen group contribution rate will be applied to each one’s payoffs in (both of) the task(s) for that round – meaning that you vote for the contribution rate after knowing your payoff from the task (, but before knowing it for the second task). All the money that is collected by this method will then be allocated equally among the 5 players in the group. When you vote on the contribution, you will select your preferred contribution rate. When you

¹Because the *Static* condition only involves one task per round, the handout was slightly modified for that treatment. All text shown in parentheses in the handout was not included for the *Static* condition, but was included for all other treatment conditions.

²The screenshot shown was identical to figure C in section A.5 of the supporting information.

do, you will see what the distribution of payoffs (meaning what everyone in the group will make) if that rate is selected for the entire group (meaning if it “wins”). So you can play around with different proposals, and then when you find one that you like, you press continue, in the bottom right of the screen, and you wait for everyone else to finish before proceeding (to perform that task a second time). The contribution rate that is ultimately selected is the median contribution rate for the group for that group – meaning that the rate that falls in the middle, where 2 proposals are higher and 2 lower.

Any questions so far?

Once you have voted (and performed the task a second time), a new round will start. You do this 10 times, basically. It’s important to point out that you will not find out the results of the vote (or of the second task performance) until the end of the experiment. We do this in order to ensure that each round of the game is independent of the other rounds, since reporting the outcomes might affect how you play the subsequent rounds. And your payoff for this experiment, beyond the \$5 and the extra credit that each of you will receive, will be based on your payoff, after the group share has been imposed and allocated equally, from 1 randomly selected task from 1 randomly selected round from the entire game. This means that from the tasks that you end up performing, only one of them will determine part of your payoff for participating in this game. Since you do not know beforehand which task will be the important one, we advise you to do your best in each task, and pay attention to vote in each round, since one of those votes will matter for how much money you leave here with.

One final word, as well, about what happens after you finish the 10 rounds. You will then be asked to answer a short survey, with some questions about your background and some of your views. This is just so we have a sense of who participated in the survey, though, don’t worry, we never take down your name or anything, so your answers and your participation in the game is perfectly anonymous. We only take down your name in the beginning, with the consent form you signed when you came in, in order to notify your professors so that you get your course credit as well. When you finish the questionnaire, make sure to click continue all the way to the end — since the last screen tells you how much your final payment will be and what your ID number is, which you’ll need to give to me so that I know how much money to give you before you leave.

That’s it. Does anyone have any questions before we get started?

A.3 Experimental Treatments

The following are the text prompts subjects receive after the first effort-task, but before the voting stage in each round. This is the only manipulation that differs across the treatments.

Static (No 2nd task, thus no text displayed)

Control

For the 2nd task, you will continue to earn 1 point for each correct movement of the slider, and your possible payoffs will remain the same at \$10, \$6, \$4, \$3, and \$2.

Upturn

For the 2nd task, you will continue to earn 1 point for each correct movement of the slider but your possible payoffs will now possibly change.

There is now a 70% probability that the possible payoffs for this task will be \$15, \$8, \$6, \$4.5, and \$3, and a 30% probability that the possible payoffs for this task will remain the same as before.

Downturn

For the 2nd task, you will continue to earn 1 point for each correct movement of the slider but your possible payoffs will now possibly change.

There is now a 70% probability that the possible payoffs for this task will be \$5, \$3, \$2, \$1.5, and \$1, and a 30% probability that the possible payoffs for this task will remain the same as before.

POUM (Half of group, other half get Control)

For the 2nd task, your possible payoffs will remain the same at \$10, \$6, \$4, \$3, and \$2, but your earnings for each correct movement of the slider will now change.

One half of the players today, including yourself, have been randomly selected to earn 2 points for each correct movement of the slider in the 2nd task. Thus, you will now earn 2 points for each correct movement. The other half of the players today will continue to earn 1 point for each correct movement of the slider.

PODM (Half of group, other half get Control)

For the 2nd task, your possible payoffs will remain the same at \$10, \$6, \$4, \$3, and \$2, but your earnings for each correct movement of the slider will now change.

One half of the players today, including yourself, have been randomly selected to earn 0.5 points for each correct movement of the slider in the 2nd task. Thus, you will now earn 0.5 points for each correct movement. The other half of the players today will continue to earn 1 point for each correct movement of the slider.

A.4 Survey Questions

The following questions were included in the post-experiment questionnaire. Participants were informed that they did not need to answer any question they did not wish to answer. Titles in brackets were not included in the survey and are only shown for clarification.

Screen 1 [Basic Information]

- What is your family’s annual income? (9 ordered choices)
- When you think about your ethnic background, which category do you fall into? (7 nominal choices)
- What is your sex? (2 nominal choices)
- What is your major? (free text)
- Thinking back on the game you just played for 10 rounds, how would you say that it made you feel? (7 point scale)
- Would you say that playing the game made you feel upset? (4 point scale)
- Have you participated in a research experiment at UNIVERSITY before? (Yes/No)

Screen 2 [Politics]

- Generally speaking, do you usually think of yourself as a Republican, a Democrat, an Independent, or what? (7 point scale)
- Here is a 7-point scale on which the political views that people might hold are arranged from extremely liberal to extremely conservative. Where would you place yourself on this scale? (7 point scale)

Screen 3 [Risk]

- Suppose in a lottery game, the possibility of winning \$1,000 is 10%. How much would you pay at most to buy a lottery ticket? (free text)
- Imagine the conditions change. Suppose you are offered \$100 in cash. However, you can instead choose a lottery ticket, which has a prize of \$2,000, but the probability of winning is not yet determined. How high should this probability be, at a minimum, for you to take the lottery ticket instead of the \$100 in cash? (free text)
- How do you see yourself: are you generally a person that is fully prepared to take risks, or do you try to avoid taking risks? Please select on the scale below, where the value 1 means “unwilling to take risks” and the value 10 means “fully prepared to take risks” (10 point scale)
- Which of the two alternatives would you chose?
 - To receive \$2,400 with certainty
 - A 25% chance of winning \$10,000
- Which of the two alternatives would you chose?

- To lose \$2,400 with certainty
- A 25% chance of losing \$10,000

Screen 4 [Egalitarian Attitudes]

- Please state how strongly you agree or disagree with the following statements: (7 point scale for each)
 - If incomes were more equal, nothing would motivate people to work hard
 - Under a free market system, people tend to get the outcomes they deserve
 - Making incomes more equal means socialism, and that deprives people of individual freedoms
 - Equal distribution of resources is unnatural
 - The way the free market system operates in the United States is fair

Screen 5 [Role of Government]

- Please state how strongly you agree or disagree that it should be the government's responsibility to: (7 point scale for each)
 - Provide for the elderly
 - Provide jobs
 - Reduce income differences
 - Provide health care
 - Provide education

Screen 6 [Manipulation Checks]

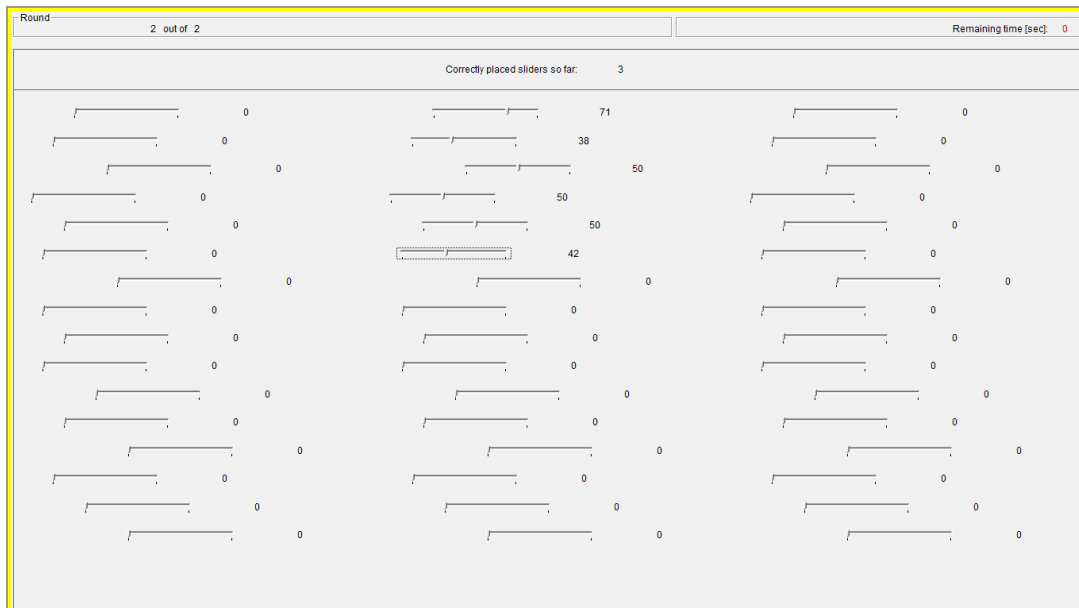
- In your opinion, how fair was the game you just played for 10 rounds? (5 point scale)
- How much do you agree with the following statement: "If players focused and tried really hard to do well on the slider task, they were able to end up with a higher monetary reward in the game." (7 point scale)
- How much do you agree with the following statement: "The slider task was based on luck more than effort." (7 point scale)
- In each round, your position after the second task was never reported. If you had to guess, how would you say that your position compared between the first task and the second task, in general over the 10 rounds you played? (5 ordered choices)
- In each round, your payoff after the second task was never reported. If you had to guess, how would you say that your payoff compared between the first task and the second task, in general over the 10 rounds you played? (5 ordered choices)
- Thinking back on the voting phase of each round of the game, would you say that voting for the share rate was confusing and difficult? (5 point scale)

Screen 7 [Thank you]

Information on earnings given.

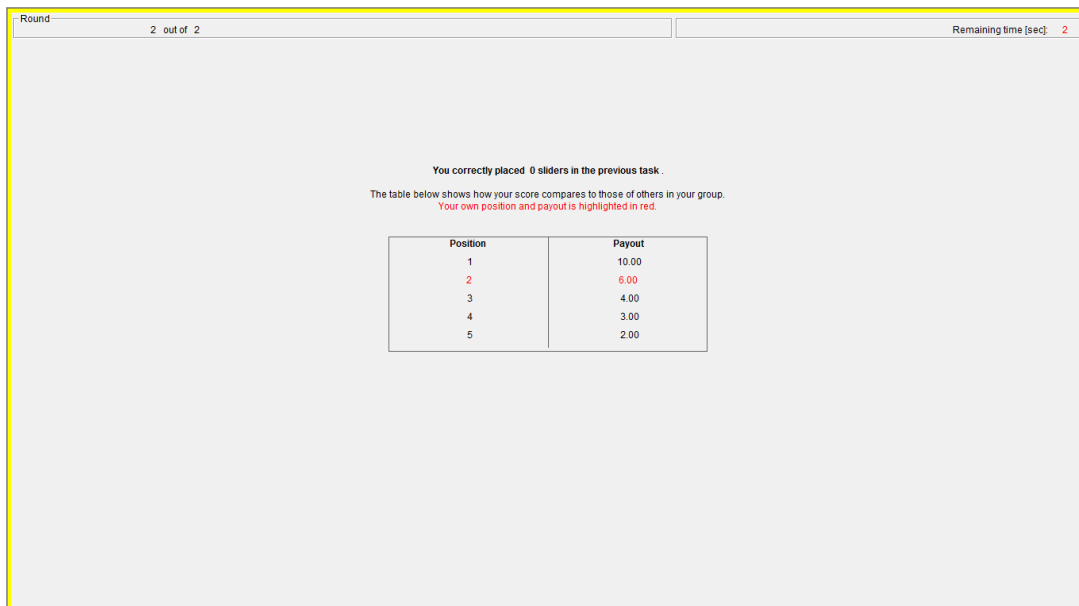
A.5 Screenshots from Program

Figure C: The Effort Task



The effort task involves moving sliders with a range from 0 to 100 exactly to the value 50.

Figure D: Ranking after 1st Task



This is the screen subjects see after completing the first task in each round. Notice that their relative rank is highlighted (in red).

Figure E: The Voting Stage

Round 2 out of 2 Remaining time [sec] 1

The table below shows how contributions and returns for each players change if your proposal is accepted.
 Your own contribution and return, based on your performance in the first task, is highlighted in red.

Rank	\$ from task	Contributed to the group account	Received from the group account	\$ after voting
1	10.00	3.40	1.70	8.30
2	6.00	2.04	1.70	5.66
3	4.00	1.36	1.70	4.34
4	3.00	1.02	1.70	3.68
5	2.00	0.68	1.70	3.02
Total	25.00	8.50	8.50	25.00

Remember, you are voting for a share rate toward a group fund that would apply equally to the payoffs of both the task you just completed and the one you are about to perform.

As mentioned before, the possible payoffs for the upcoming task are the same as the previous task, which means that the final payoffs illustrated above will apply to the earnings of both tasks for this round.

Select your proposed group contribution rate

Your desired contribution rate: 0% 100%

Contribution to the group: 34

This is the voting stage. Subjects select the tax rate using the slider near the bottom of the screen. When they move the slider the values in the table update to reflect how the chosen tax rate affects the payout of every player.

A.6 Robustness Checks

The regression models reported in the main analysis include a subject level random effect to account for idiosyncratic differences between individuals. However, the models do not include session level random effects to account for idiosyncratic differences between different sessions of the experiment. We do not include such effects in the main analysis, since the experiment is designed to minimize the effects of potential session level effects, such as certain subjects developing a reputation and/or learning about the behavior of other subjects in the session. Below we report the results of all of the regression models included in the main analysis with session level random effects included. The effects on the results are minimal.

Table C: Mixed Effects Models with Session Effects Included

	Model 1	Model 2	Model 3
Constant	40.47 (1.89)*	44.39 (1.83)*	52.80 (3.80)*
Static	0.16 (3.45)	0.40 (2.90)	-1.29 (2.99)
Upturn	9.55 (3.45)*	9.79 (2.90)*	8.88 (3.01)*
POUM	-11.38 (4.01)*	-10.30 (3.37)*	-10.58 (3.37)*
Downturn	-5.99 (3.45)	-5.75 (2.90)	-6.19 (2.93)*
PODM	11.55 (4.01)*	11.81 (3.37)*	10.10 (3.51)*
Rank 1		-27.76 (1.48)*	-26.79 (1.53)*
Rank 2		-20.39 (1.44)*	-19.67 (1.47)*
Rank 4		7.47 (1.44)*	7.85 (1.46)*
Rank 5		19.85 (1.52)*	20.15 (1.54)*
Female			-3.01 (1.95)
Family Income			-0.90 (0.43)*
Republican			-1.76 (1.02)
Conservatism			0.69 (1.12)
BIC	18816.49	17915.55	16928.98
Observations	2000	2000	1890
Subjects	200	200	189
Sessions	20	20	20
Subject Variance	189.30	138.97	131.30
Session Variance	0.00	0.00	0.00
Residual Variance	607.62	378.76	375.42

* $p < 0.05$. Standard errors in parentheses. [Kenward and Roger \(1997\)](#) approximation for degrees of freedom used for hypothesis tests.

Table D: Mixed Effects Models, by Rank, with Session Effects Included

	Rank 1 and 2	Rank 3	Rank 4 and 5
Constant	20.73 (1.73)*	44.71 (2.25)*	55.88 (2.34)*
Static	-10.21 (3.02)*	-6.64 (4.13)	15.66 (4.13)*
Upturn	16.30 (3.13)*	17.66 (4.15)*	1.79 (4.28)
POUM	-9.08 (3.73)*	-11.07 (4.89)*	-10.56 (5.05)*
Downturn	-4.96 (3.07)	-6.60 (4.16)	-1.74 (4.27)
PODM	18.92 (3.67)*	14.98 (4.72)*	4.76 (4.89)
BIC	6751.06	3628.55	7384.89
Observations	800	400	800
Subjects	181	172	179
Sessions	20	20	20
Subject Variance	126.97	129.42	211.69
Session Variance	0.00	0.00	0.00
Residual Variance	195.29	378.58	455.87

* $p < 0.05$. Standard errors in parentheses. [Kenward and Roger \(1997\)](#) approximation for degrees of freedom used for hypothesis tests.

As discussed in the main text, half of the subjects in the *POUM* and *PODM* conditions (those not experiencing *POUM* or *PODM*, respectively) received the same prompt as the subjects in the *Control* condition for the entire game. Because they were not informed that the other half of the subjects were experiencing *POUM* or *PODM*, we classify them with the subjects from the *Control* condition in our primary analysis. As pointed out by an anonymous reviewer, it might be the case that these *Control* subjects did not behave as the “true” *Control*, since they interacted with subjects which were experiencing *POUM* or *PODM*. For robustness, we ran the mixed effects models from the main paper with these potentially “impure” subjects excluded. As shown in the two tables below, the results are substantively unchanged, although due to the smaller sample size they become more uncertain.

Table E: Mixed Effects Models with “Impure” Controls Exluded

	Model 1	Model 2	Model 3
Constant	40.32 (2.87)*	44.26 (2.81)*	52.79 (5.01)*
Static	0.31 (4.05)	0.31 (3.69)	-2.29 (3.81)
Upturn	9.69 (4.05)*	9.69 (3.69)*	8.04 (3.83)*
POUM	-11.23 (4.53)*	-10.38 (4.13)*	-11.40 (4.18)*
Downturn	-5.84 (4.05)	-5.84 (3.69)	-7.27 (3.76)
PODM	11.70 (4.53)*	11.73 (4.13)*	8.86 (4.27)*
Rank 1		-28.13 (1.67)*	-26.83 (1.73)*
Rank 2		-20.50 (1.61)*	-19.49 (1.66)*
Rank 4		7.62 (1.61)*	8.05 (1.64)*
Rank 5		21.33 (1.69)*	21.72 (1.73)*
Female			-2.93 (2.32)
Family Income			-0.84 (0.53)
Republican			-2.38 (1.18)*
Conservatism			0.67 (1.34)
BIC	15115.32	14358.01	13367.98
Observations	1600	1600	1490
Subjects	160	160	149
Subject Variance	182.64	166.74	155.64
Residual Variance	636.54	379.68	375.71

* $p < 0.05$. Standard errors in parentheses. The *Control* condition is omitted from the model, meaning the coefficients for each treatment can be interpreted with respect to the *Control* condition. Kenward and Roger (1997) approximation for degrees of freedom used for hypothesis tests.

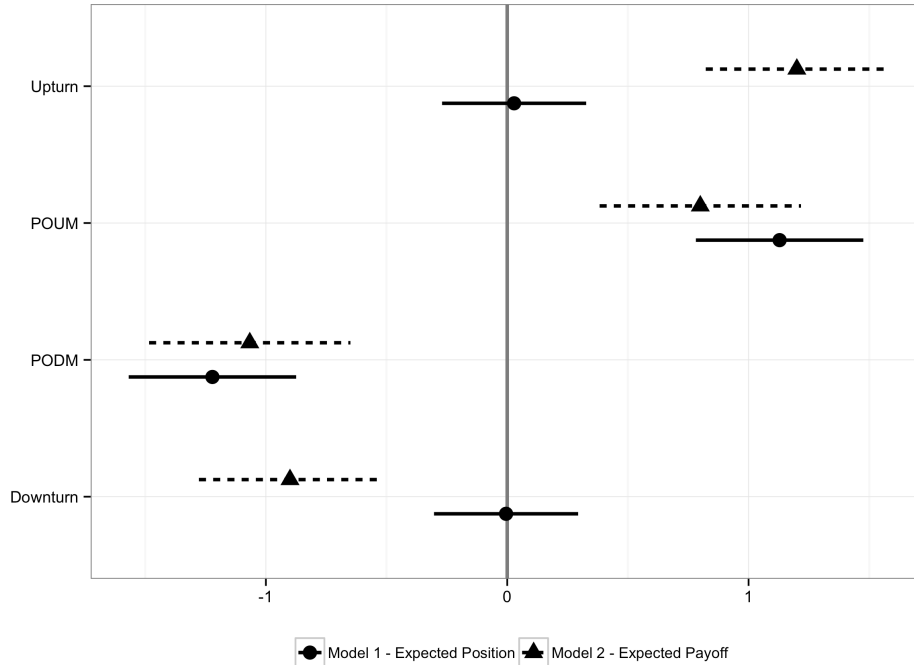
Table F: Mixed Effects Models, by Rank, with “Impure” Controls Excluded

	Rank 1 and 2	Rank 3	Rank 4 and 5
Constant	21.38 (2.70)*	45.09 (3.58)*	56.35 (3.54)*
Static	-10.83 (3.76)*	-7.04 (5.09)	15.18 (4.93)*
Upturn	15.65 (3.86)*	17.30 (5.11)*	1.32 (5.07)
POUM	-9.76 (4.41)*	-11.73 (5.79)*	-11.03 (5.74)
Downturn	-5.52 (3.80)	-6.85 (5.11)	-2.22 (5.05)
PODM	18.26 (4.36)*	14.67 (5.62)*	4.28 (5.60)
BIC	5443.50	2881.43	5896.73
Observations	644	318	638
Subjects	148	138	145
Subject Variance	146.82	164.61	217.05
Residual Variance	193.95	358.83	462.05

* $p < 0.05$. Standard errors in parentheses. The *Control* condition is omitted from the model, meaning the coefficients for each treatment can be interpreted with respect to the *Control* condition. [Kenward and Roger \(1997\)](#) approximation for degrees of freedom used for hypothesis tests.

A.7 Manipulation Checks

Figure F: Manipulations Checks



Note: Point estimate and 95% confidence intervals shown.

Notes: The dependent variable in model 1 are answers (on a five point scale) to the question “In each round, your position after the second task was never reported. If you had to guess, how would you say that your position compared between the first task and the second task, in general over the 10 rounds you played?”.

The dependent variable in model 2 are answers (on a five point scale) to the question “In each round, your payoff after the second task was never reported. If you had to guess, how would you say that your payoff compared between the first task and the second task, in general over the 10 rounds you played?”

Indicator variables for the four forward looking treatment conditions were the only independent variables in both models — the *Control* condition was the omitted category. As a consequence, the coefficients should be interpreted as the difference between each treatment condition and the *Control*.

The results show that the manipulations worked as expected, compared to the *Control* condition. The results for model 1 show that the *POUM* and *PODM* conditions affected the expected rank of subjects, while the *Upturn* and *Downturn* conditions did not. The results for model 2 show that all conditions affected the expected payout of subjects in the correct direction. Thus, subjects in the *PODM* and *Downturn* conditions expected to receive a lower payout than those in the *Control* condition, while the opposite held true for the *POUM* and *Upturn* conditions.