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SUPPLEMENTARY INFORMATION

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Corrupting cooperation and how anti-corruption strategies may backfire

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Supplementary Methods

Experimental Design

Random Assignment to Treatments

Each group of players was randomly assigned to:

1. Version A or B, which determined whether demographics and background questions were administered before or after game play.
2. Low or High economic potential, which was the public goods game marginal per capita return (MPCR).
    - High Economic Potential: 0.6 MPCR
    - Low Economic Potential: 0.3 MPCR
3. Weak or Strong leader power, which was the punishment multiplier for institutional punishment.
    - Weak Leader Power: 1 x punishment multiplier
    - Strong Leader Power: 3 x punishment multiplier
4. Four of the five versions of the public goods game (institutional punishment public goods game; control, bribery game, bribery game with partial transparency, bribery game with full transparency, bribery game with leader investment) to be played in a random order. Four rather than five treatments were administered due to time constraints. Economic potential and leader power did not change between games.

Random assignment was performed using the Random functions in Excel or Google Sheets. Since the experimenter selected the treatments in the software, they were not blind to the treatment.

In the partial transparency treatment, players could see the leaders contribution to the public pool. This offered leaders an opportunity to reveal a norm through their own actions.

In the full transparency treatment, players could see all leader actions (though anonymized)—the size of contributions, the size of bribes, and the leaders decision in each case. This level of transparency in leader behaviors would be the ultimate goal of many campaigns and can be explored in an experimental setting.

In the leader investment treatment, leaders are forced to maximally contribute to the public pool tying their own payoff to its success. This treatment was inspired by the Singaporean model. In the Singaporean model, a leaders' salary is determined by (a) the highest paid professionals in the country and (b) the GDP of the country. The goal here is to incentivize leaders to increase average and top-end growth in society. Although it could be that higher salaries rather than the direct incentives reduce corruption in Singapore, recent evidence from Ghana and neighboring countries suggests that increasing police officer salaries actually *increases* bribe behavior[1]. Ideally, to fully capture the Singaporean model, we would have included some kind of extra bonus based on the size of the public pool and perhaps the payoff to the highest earning player, but we didn't want this treatment to be too far out of line with the other treatments. That is, we wanted to test leader investment with minimal changes to the overall game structure. Nevertheless, in its current form, the effect of this treatment has alternative explanations. Most concerning, forcing leaders to maximally contribute, leads to them having large stake in the public goof, a particular problem in smaller groups. For this reason, without further investigation, we should be especially cautious about the degree to which these results will translate to larger populations and we only report the results in the Supplementary Information.

In order to remove reputational effects, for each round, the leader was also randomly selected by the software, with replacement, such that leaders could be leaders for consecutive rounds.

Procedure

Participants entered the room and were asked to sit down at a computer. Computers were separated by a barrier so that participants could not see other players' screens. A consent form, pen and headphones were laid out on each keyboard. Participants were told to put on the headphones and click play on the video. All further instructions were provided via the software and via video to ensure all participants received the same information. Sample screenshots for each treatment are shown in the next section (Screenshots from Experiment) and full scripts with screenshots from the video are shown in the final section (Experimental Protocol). After the instructions for each treatment, participants were administered a quiz via the experimental software. The quiz ensured

that participants understood the instructions. Participants had to answer questions correctly to begin the treatment. The quiz questions are also provided in the final section (Experimental Protocol).

Measures Collected

In addition to player and leader behavior in the game, we collected the following measures. This is a complete list of all measures collected. No additional measures were collected.

1. Prestige and Dominance Scale [Self-report version][2]
2. Right Wing Authoritarianism (RWA) scale[3]
3. How old are you in age?
4. What is your gender?
5. If you are student, what degree are you studying for (e.g. B Arts, B Sc)? If you are working, what is your occupation (e.g. Pharmacist)?
6. Major (if degree) What is your major (e.g. Chemistry) or industry (e.g. Health)?
7. Have you lived your entire life in Canada?
8. If no, where else have you lived (please list)? [Note: these countries were used to calculate the Exposure Corruption Score]
9. What suburb do/did you live in for most of your time in Canada?
10. Please specify the ethnic (cultural) group you primarily identify with (e.g. Punjabi,Cantonese Chinese, Mandarin Chinese, Japanese, European, etc.) [Note: these identities were used to calculate the Heritage Corruption Score. Cantonese Chinese were assumed to be from Hong Kong and Mandarin Chinese were assumed to be from China. Ambiguous country of origin, such as Armenian, were not included]
11. What is the native language of your ethnic group?
12. How well do you speak the native language of your ethnic group?
13. Inclusion of Other in the Self Scale[4] for ethnic group
14. Inclusion of Other in the Self Scale[4] for other Canadians
15. What is your religious background?
16. How important is religion in your daily life?
17. Vancouver Index of Accultaration[5]

The last 39 groups (194 participants) were also asked the following questions about their preferences for the game:

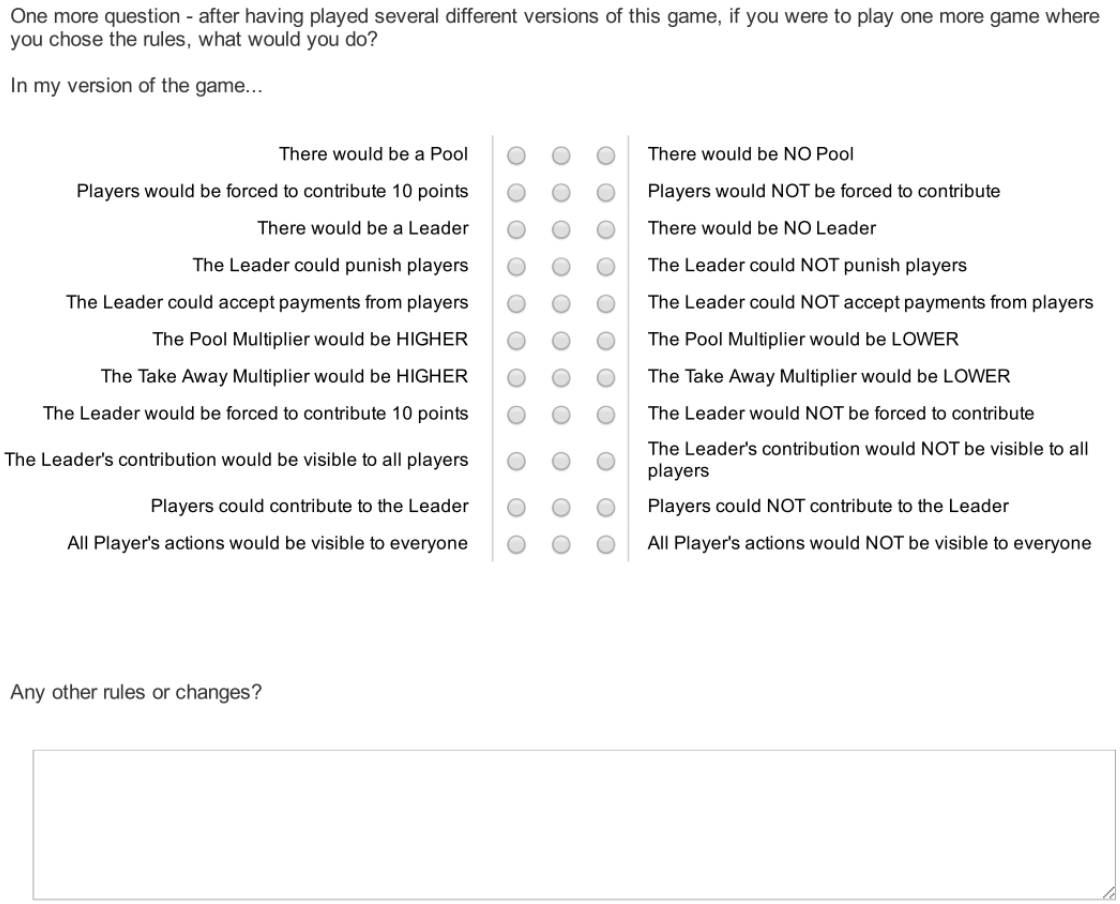


Figure S1. After the experiment had concluded, participants were asked for their preferred game paramters.

Corruption Perception Scores

Below are histograms for distributions of heritage corruption score (the mean of the Corruption Perception Index[6] values of players' countries of ethnic heritage) and a exposure corruption score (the mean of the Corruption Perception Index values of the countries in which they had lived). As discussed in the main text, the heritage corruption score represents the potential influence of vertically transmitted corruption norms (parent to child), whereas the exposure corruption score represents corruption norms to which the participant was directly exposed (i.e., potentially personal experience as well as vertical, horizontal, and oblique transmission).

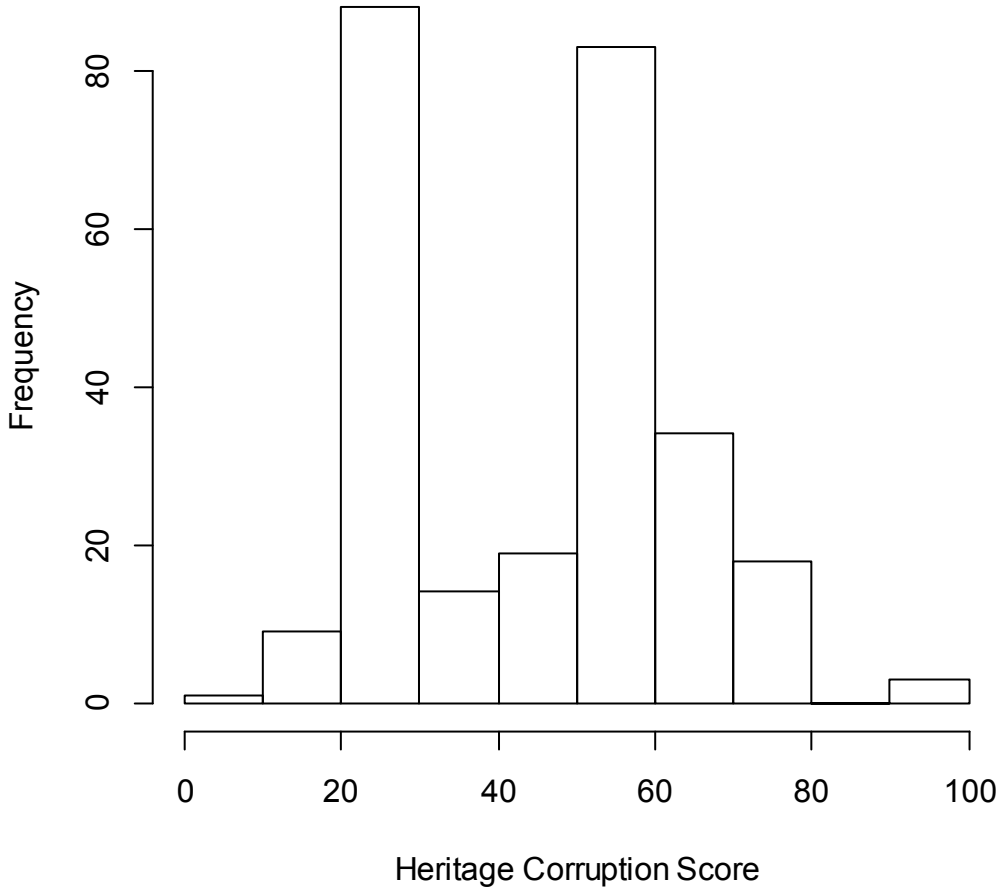


Figure S2. Histogram of Heritage Corruption Scores.

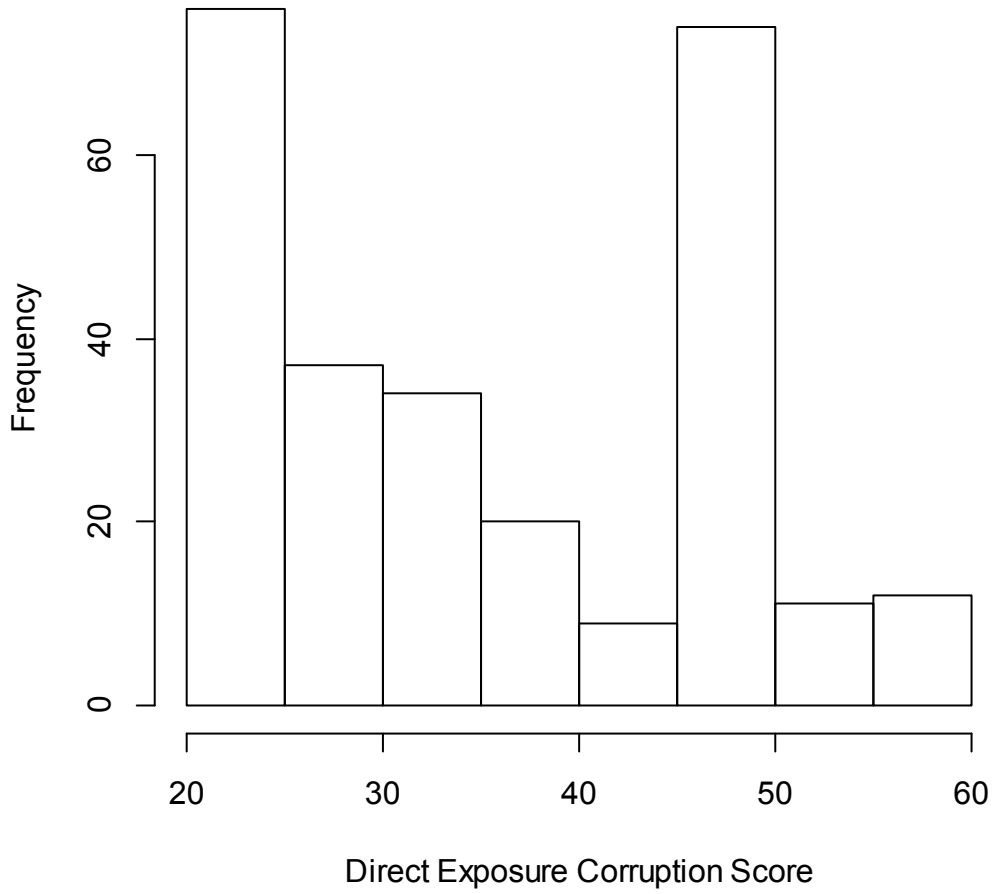


Figure S3. Histogram of Exposure Corruption Score.

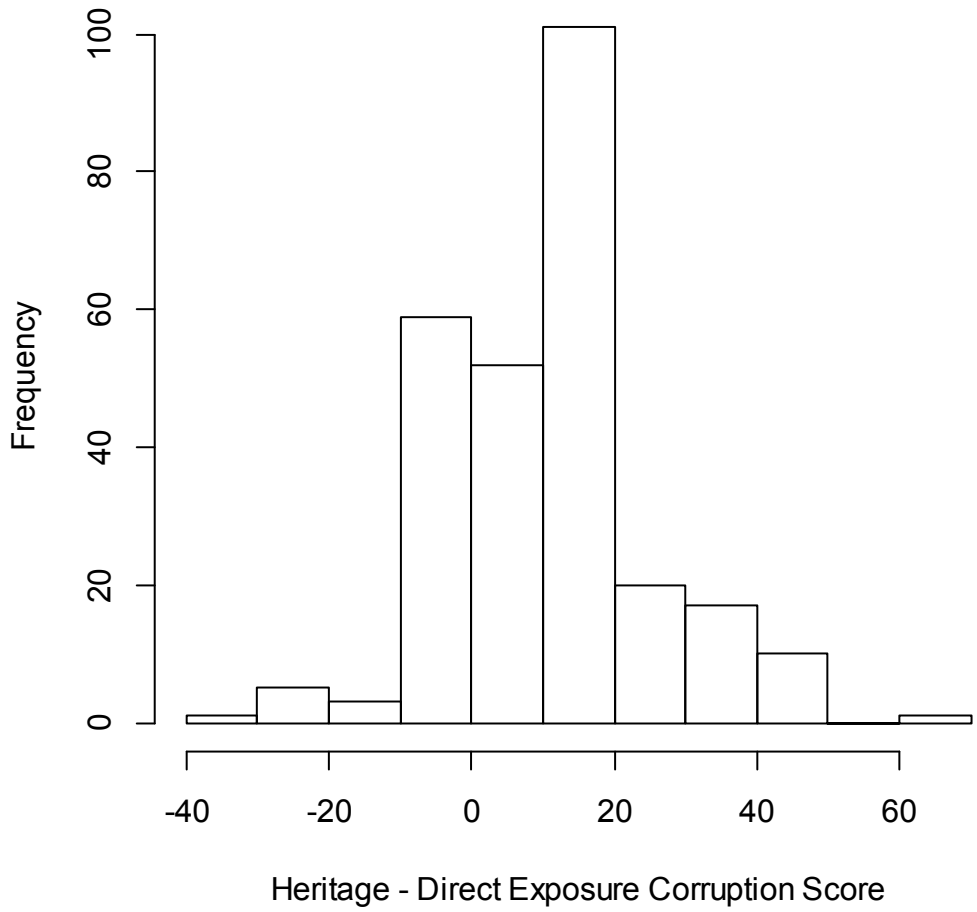


Figure S4. Histogram of Exposure Corruption Score subtracted from Heritage Corruption Score. This plot illustrates that these scores are not identical and in some cases, have very different values.

Sampling

Based on a pilot of 50 participants, we expected a fairly large effect size and aimed to have at least 250 participants. All data was included, unless the software crashed (resulting in data loss or less than 10 rounds for that treatment). This happened for 5 of the 224 treatment groups. Incomplete data (and obviously lost data) was discarded prior to any analyses.

Block Randomization

We used block randomization so that we could both avoid end game effects where participants played differently in the final periods knowing that the game would end, but also have player data from 10 periods within each treatment. To explain this procedure, here is the description provided to participants via the instructional video:

> Interactions with your group will be divided into a series of rounds. Each round has differences from other rounds. The instructions for each round will be provided by video before the round begins. Each round is made up of several periods. The probability of a round ending is 10% for each period. What this means is that on average you will play 10 periods, but you may play many more or many fewer. If a round ends before 10 periods, you will still play through to the 10^{th} period, but only the periods before the ending period will be counted for your payment. You will be informed which period was the last period at the end of the round.

The full script and screenshots from the video are shown in the final section (Experimental Protocol). Sample screenshots for each treatment are shown in the next section (Screenshots from Experiment).

Screenshots from Experiment

Below are screenshots for each version of the game illustrating the Player view, Leader view when playing, and Leader view when making decisions regarding other players. All instructions were provided through pre-recorded videos. The script for these videos along with all screenshots can be found in the Experimental Protocol section.

Institutional Punishment Public Goods Game

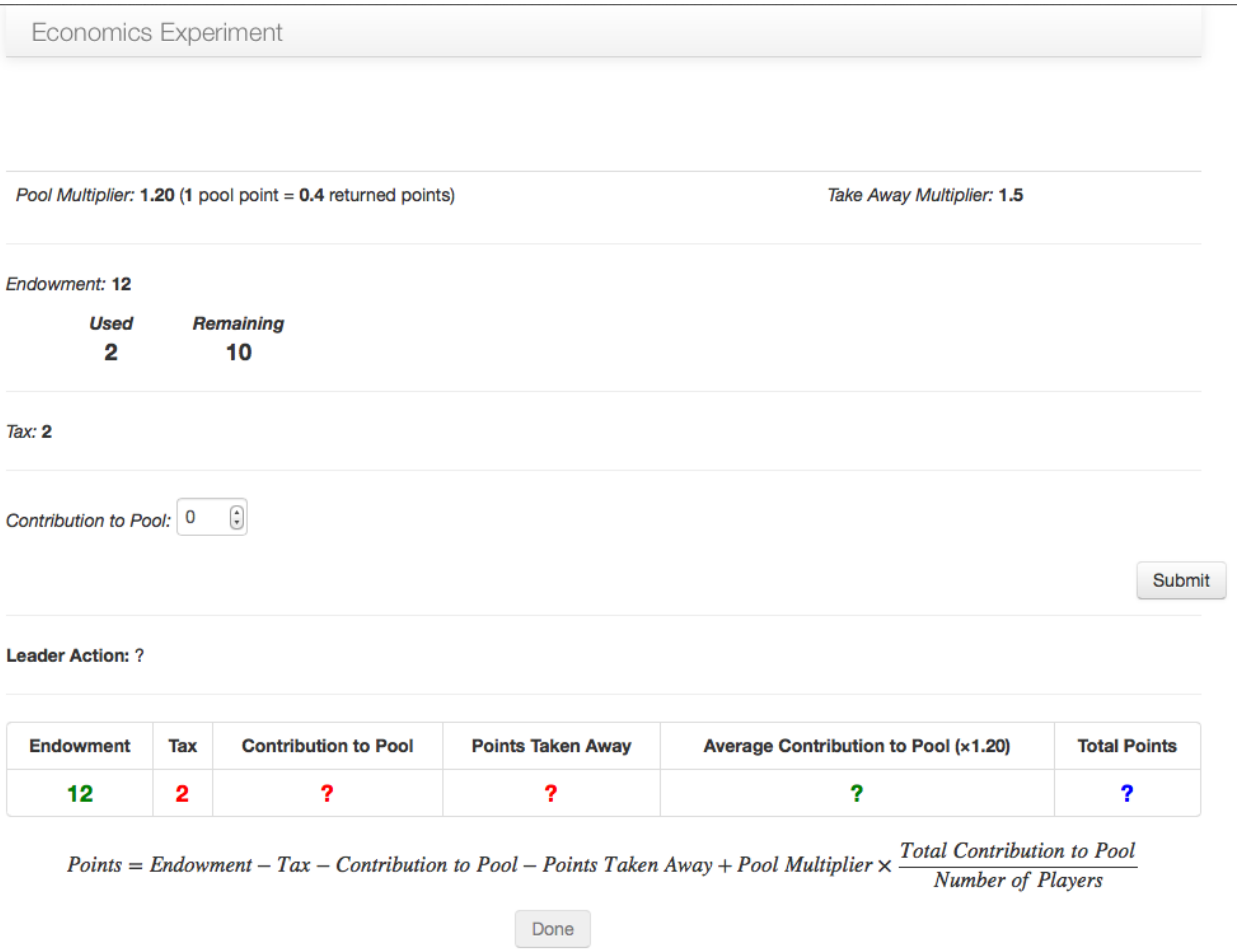


Figure S5. Player screen. The leader's decision (Do Nothing or Take Away Points) is displayed after "Leader Action". It is displayed after the leader has made their choice.

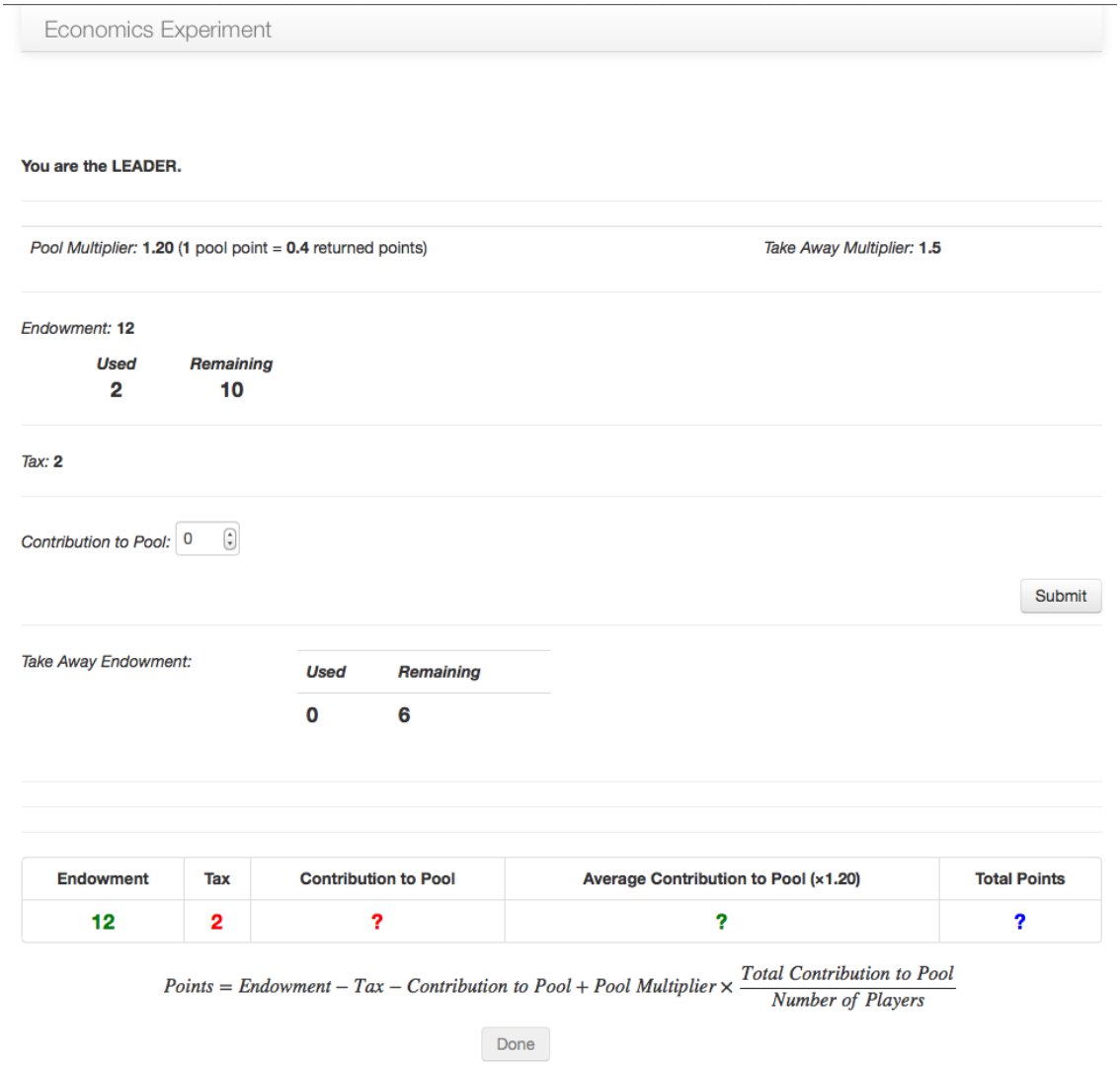


Figure S6. Leader screen for play. After all players have made their decision, leaders can choose how to react to player choices.

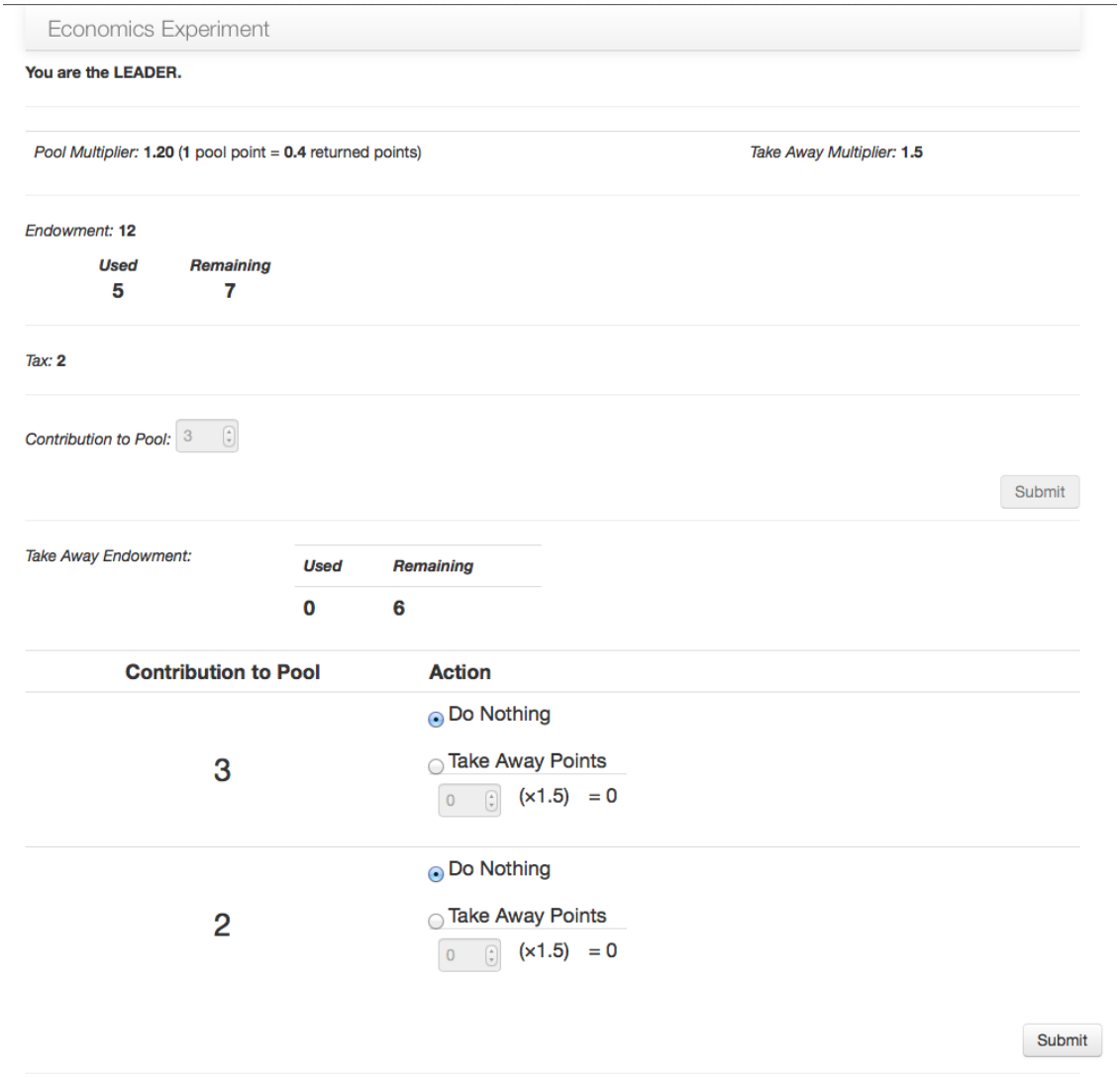


Figure S7. Leader screen for decision regarding players. Leaders are shown anonymized player choices and can choose to Take Points Away or Do Nothing.

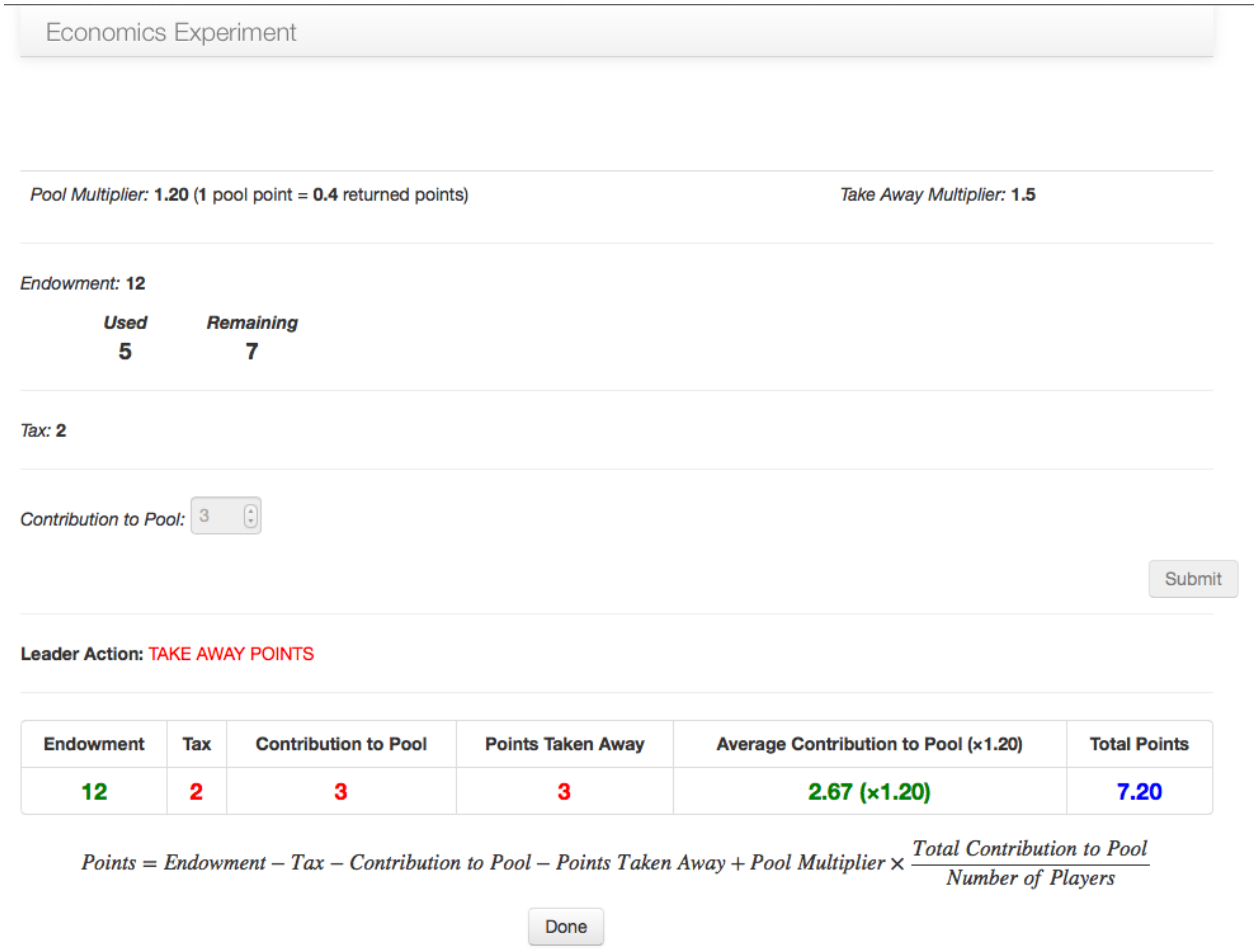


Figure S8. Example of player screen after leader decision. Here the leader has chosen to Take Away Points.

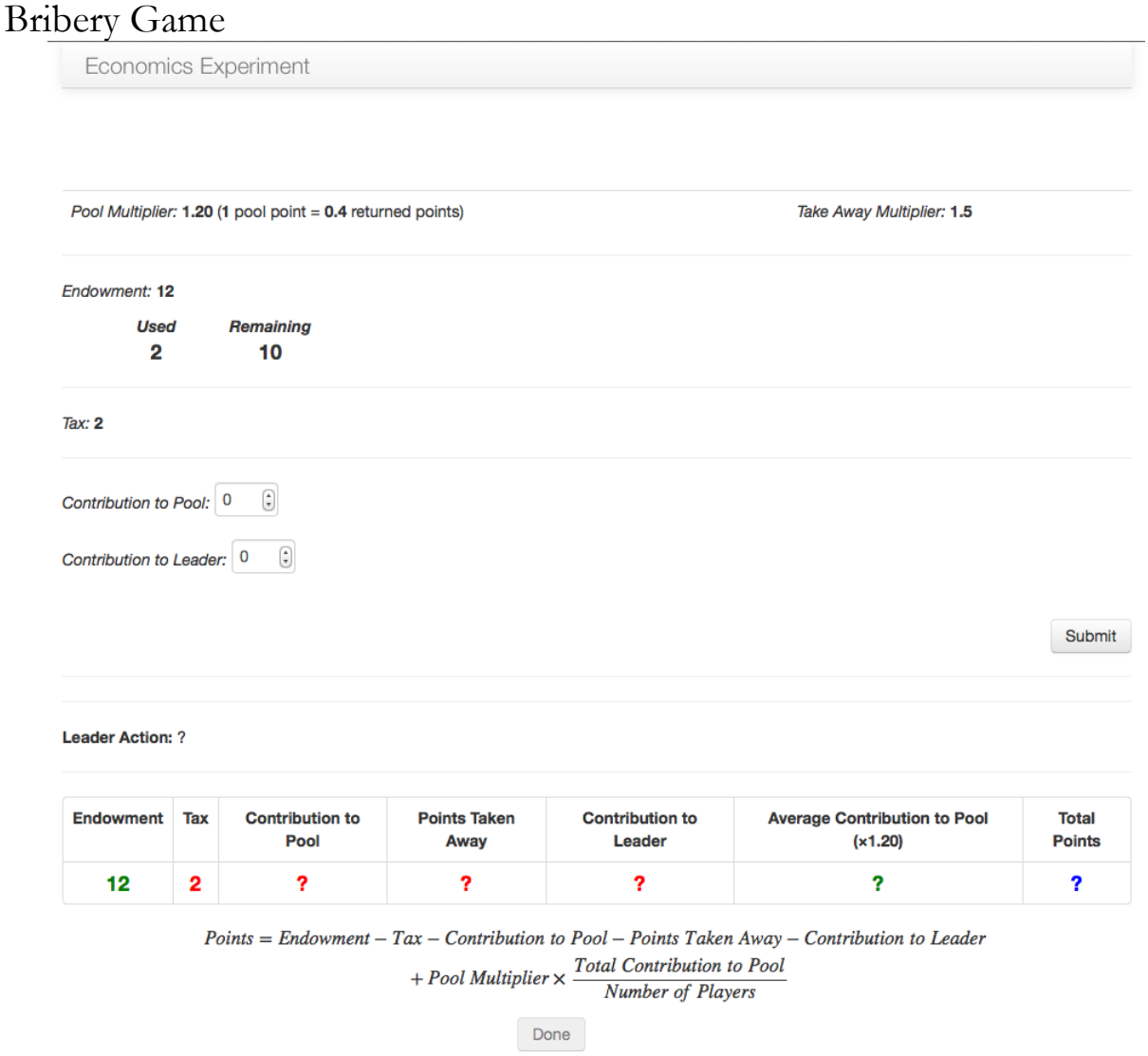


Figure S9. Player screen. Leader action (Do Nothing or Take Away Points) is displayed after the leader has made their decision. The key difference in the Bribery Game is the additional player choice to Contribute to Leader.

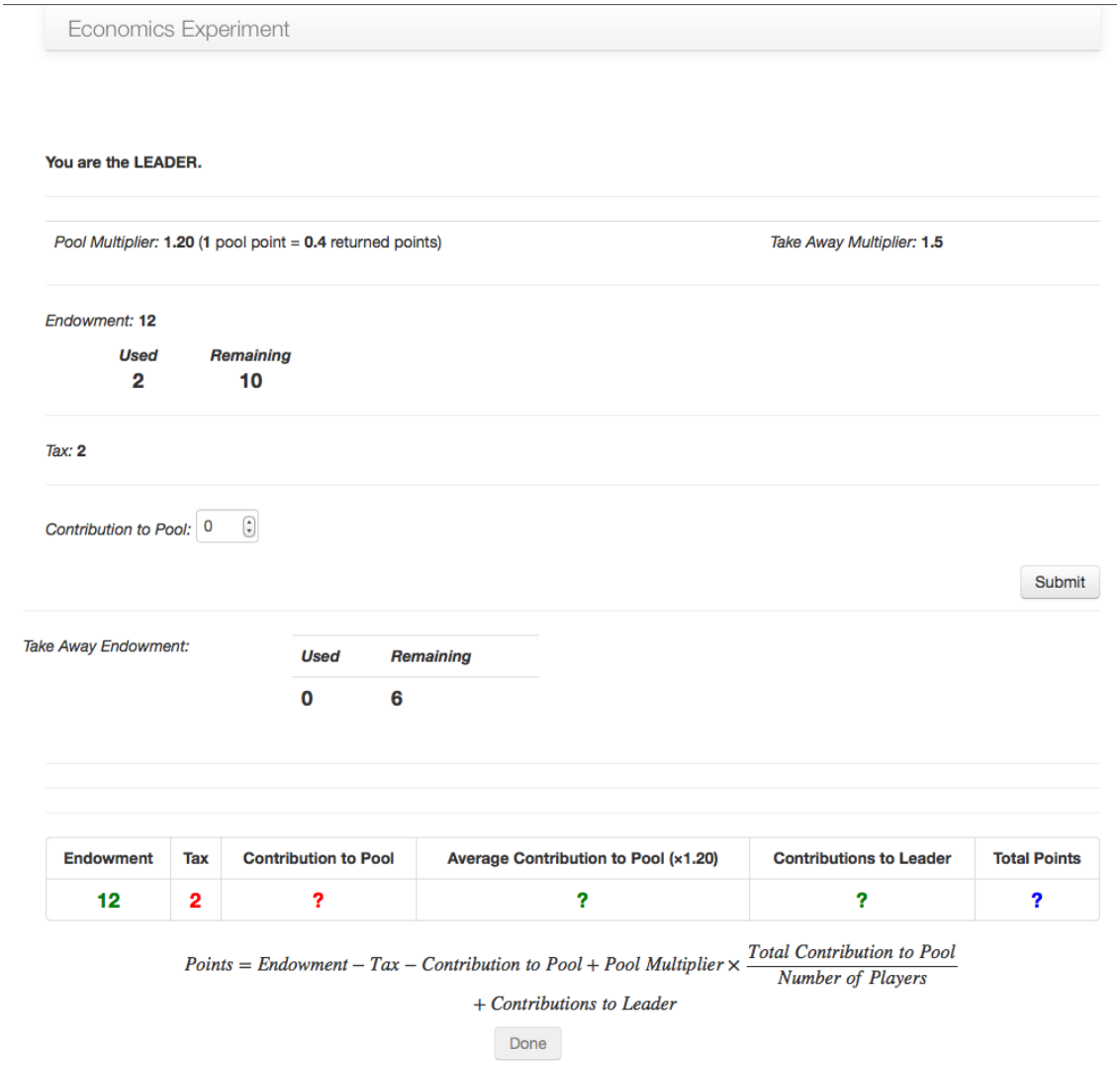


Figure S10. Leader screen for play. Note that leaders cannot contribute to themselves. After all players have made their decision, leaders can choose how to react to player choices.

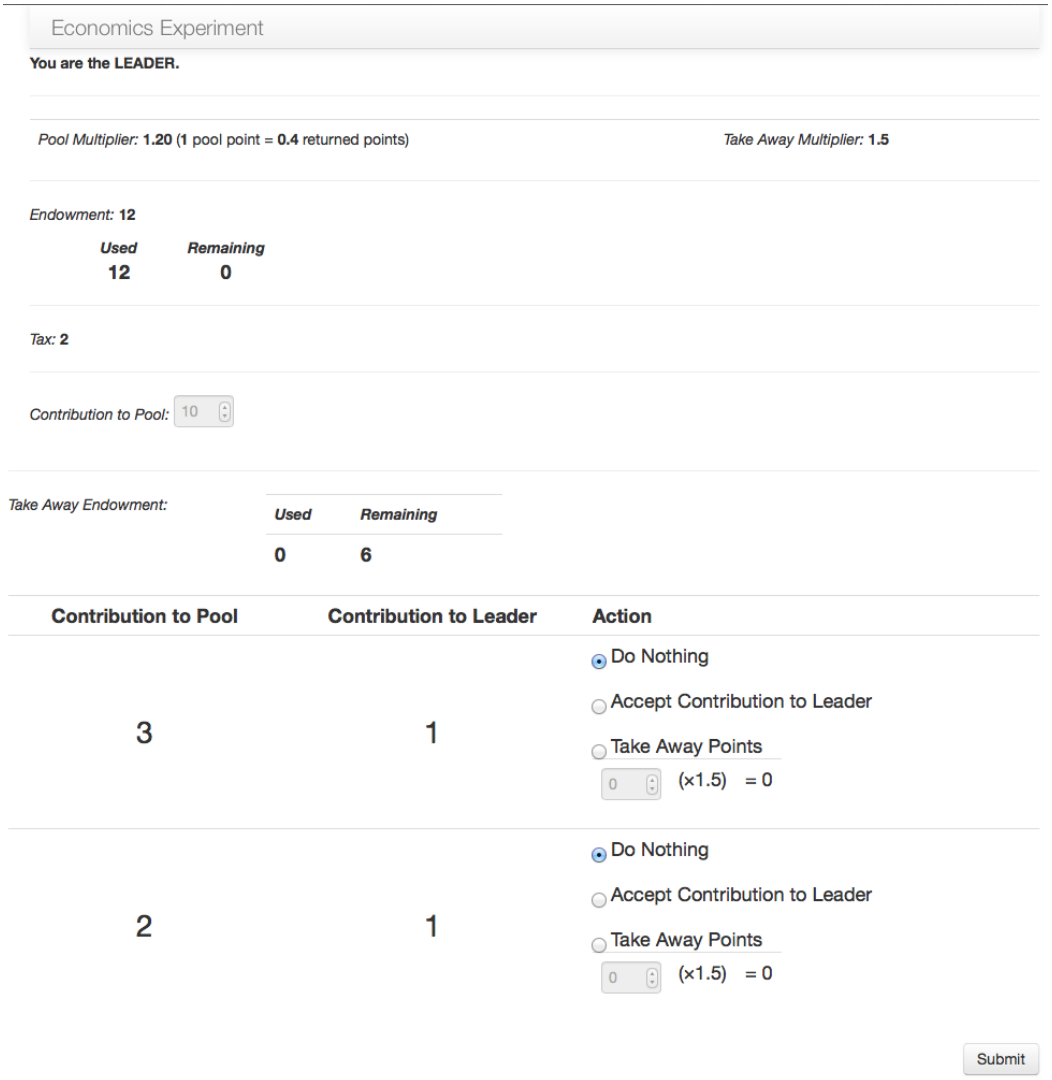


Figure S11. Leader screen for decision regarding players. Leaders are shown anonymized player choices and can choose to Take Points Away, Accept Contribution to Leader, or Do Nothing.

Bribery Game with Partial Transparency

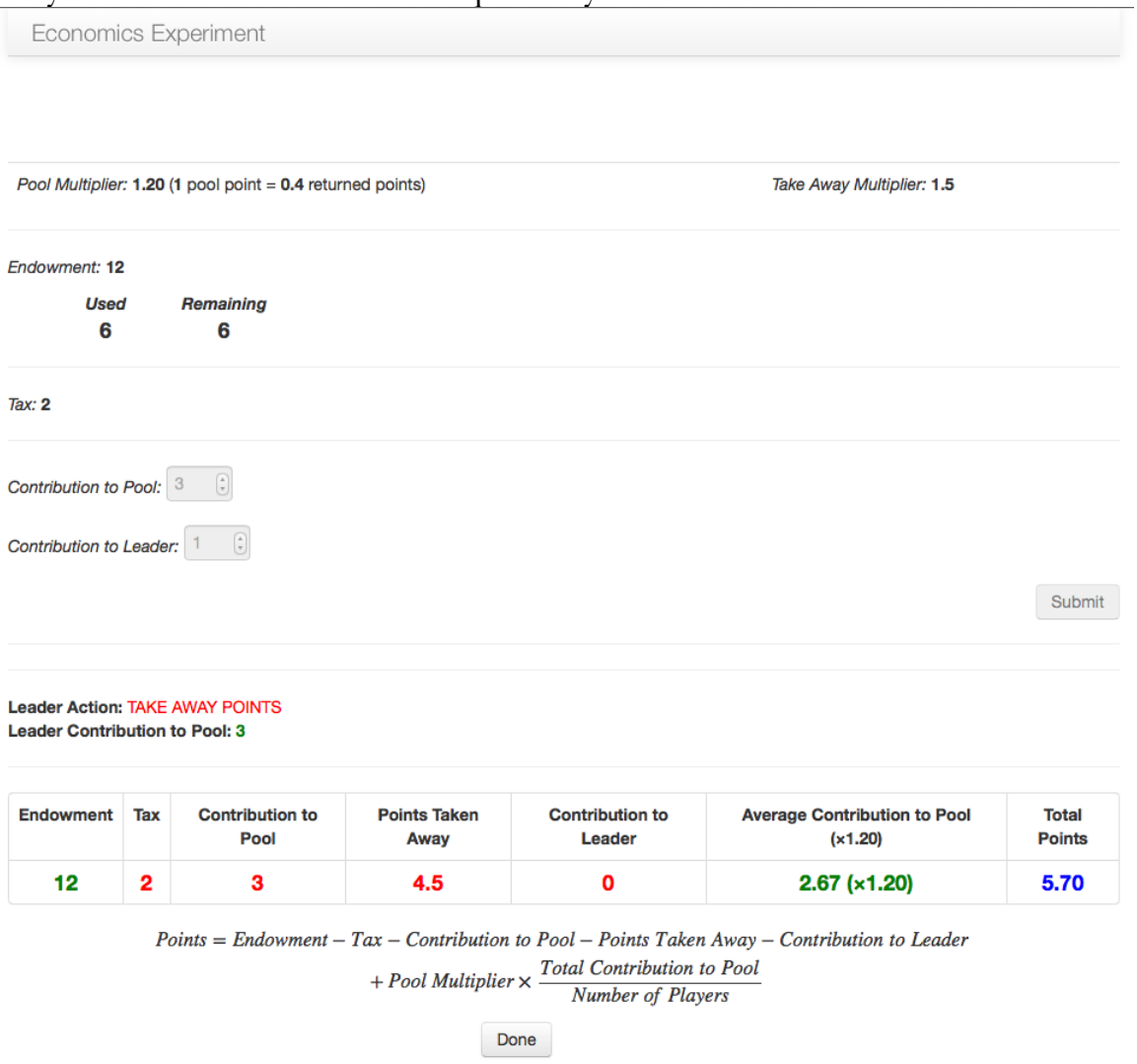


Figure S12. Player screen after Leader decision. Note that below Leader Action (Do Nothing, Take Away Points, or Accept Contribution to Leader) is the Leader's Contribution to the Pool. All other screens are identical to Bribery Game. Here the Leader has contributed 3 points to the public pool and has chosen to take away points from this player.

Bribery Game with Full Transparency

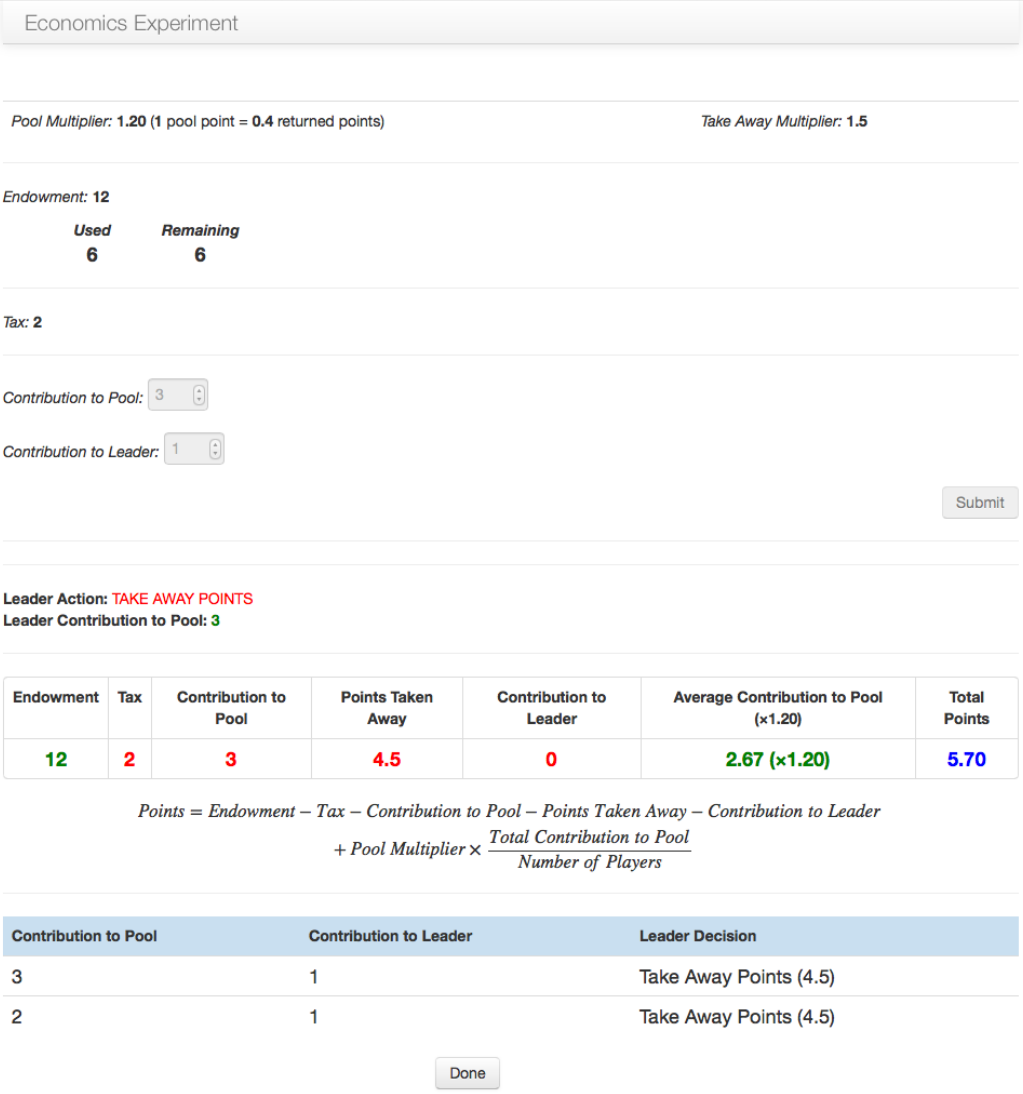


Figure S13. Player screen after Leader decision. Note that below Leader Action (Do Nothing, Take Away Points, or Accept Contribution to Leader) is the Leader's Contribution to the Pool, as in Bribery Game with Partial Transparency. However, now all Leader and Player Actions are displayed in a table. All other screens are identical to Bribery Game.

Bribery Game with Forced Leader Contribution

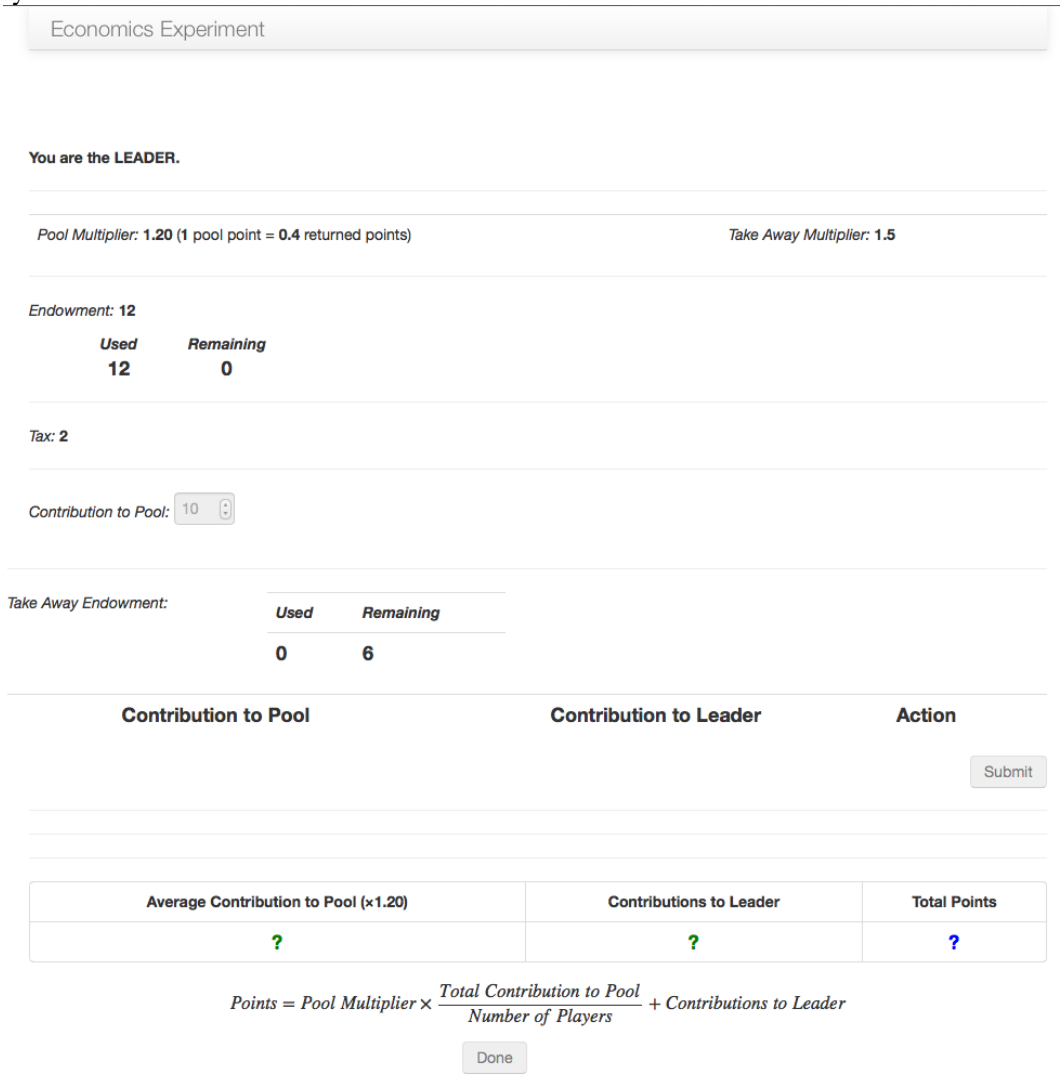


Figure S14. Leader screen for play. Note that all leader points are automatically contributed to the pool. All other screens are identical to Bribery Game.

Experimental Protocol

The videos were created using Microsoft Powerpoint and exported as a video. For sections of the instructions that were shared between treatments, the same slide and recording were used to ensure there were not even minor differences in aspects as such intonation. The following is a transcript of the experimental video with screenshots. All participants first heard the General Description. They then heard the First Round version of the treatment they received first. All subsequent treatments had the Subquent Round version of the treatment instructions, which highlighted the difference with other treatments. Also included are the quiz questions administered to all participants. These quizzes were used to ensure participants understood the instructions and the differences between treatments. Participants had to answer all questions correctly before they could proceed.

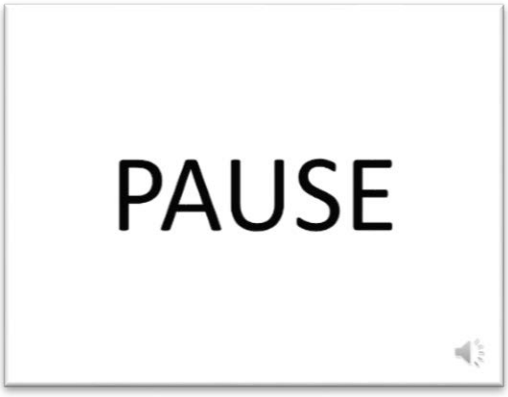
The instructional videos infomed participants that they would receive 10c per point and be paid for 8 random rounds. However, early pilots testing the software suggested that this would not result in adequate conpensation for participants as per <Institution Subject Pools> policies. Rather than record all instructional videos, we instead informed participants that they would actually be paid 15c per point for 10 random rounds rather than 10c per point for 8 random rounds, but that all other aspects of the instructions were correct and unchanged. No participants had questions or complained about this change.

General Description

Welcome to the experiment. All instructions will be provided through videos. It is prohibited to communicate with other participants during this experiment, however, please feel free to ask the experimenter any questions.

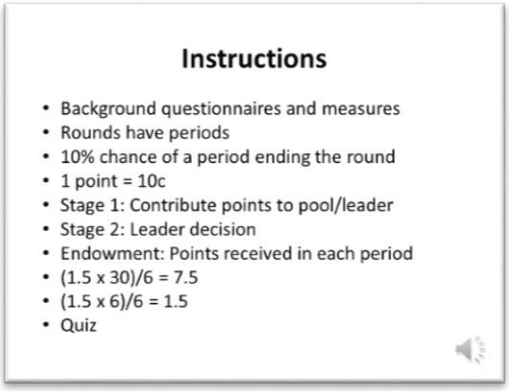
You are invited to participate in this experiment. When you are ready, please pause the video to read and sign the consent form.

<PAUSE>

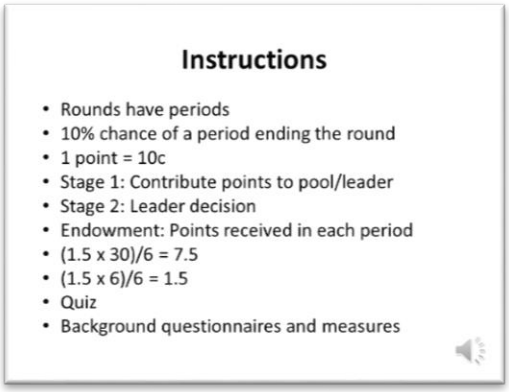


If you are happy to continue, we may now begin the study. First, please turn off your mobile phone or other electronic devices.

There is no deception in this experiment: all other group members are real people and all monetary amounts are paid precisely as described. If you need further clarification about any aspect of this experiment, please let the experimenter know before we begin.



[VERSION A: You will begin by completing some background questionnaires and measures. You will then engage in a series of interactions with a group of other people via the computer and will be asked to make some decisions.]



[VERSION B: You will engage in a series of interactions with a group of other people via the computer and will be asked to make some decisions.]

Interactions with your group will be divided into a series of rounds. Each round has differences from other rounds. The instructions for each round will be provided by video before the round begins. Each round is made up of several periods. The probability of a round ending is 10% for each period. What this means is that on average you will play 10 periods, but you may play many more or many fewer. If a round ends before 10 periods, you will still play through to the 10^{th} period, but only the periods before the ending period will be counted for your payment. You will be informed which period was the last period at the end of the round.

During this experiment, we will refer to points. Every point is worth 10 cents in today's experiment. You will be paid for 8 periods randomly selected from across all rounds. Together with your $10

show up fee, you could earn over $35 today, but the precise amount depends on your actions and the actions of other group members.

In each period the experiment consists of two stages. At the first stage you have to decide how many points you would like to contribute to a project, refered to as a pool, and to a group member designated as a leader. In the second stage, the group member designated as a leader will make a decision whether to accept points from group members or whether or how much to reduce the earnings of group members from the first stage. The leader is also a group member in the first stage, but does not make a decision about themselves.

At the beginning of each period each participant receives an endowment of points. We call this his or her endowment. Your task is to decide how to use your endowment. You have to decide how many of the points you want to contribute to the pool, how many you want to contribute to the leader, and how many of them to keep for yourself. All your decisions are anonymous.

The income of each group member from the pool is calculated in the same way, this means that each group member receives the same income from the pool, regardless of how much they contributed. Suppose the pool multiplier is 1.5 and the sum of the contributions of all group members is 30 points. In this case each member of the group receives an income from the project of: 1.5 times 30 = 45 divided by the number of group members. So if there are 6 group members, each group member would receive 45 divided by 6, or 7.5 points. If the total contribution to the project is 6 points, then each member of the group receives an income of 1.5 times 6 = 9 divided by the number of group members. So for 6 group members, each group member would receive 9 divided by 6, or 1.5 points.

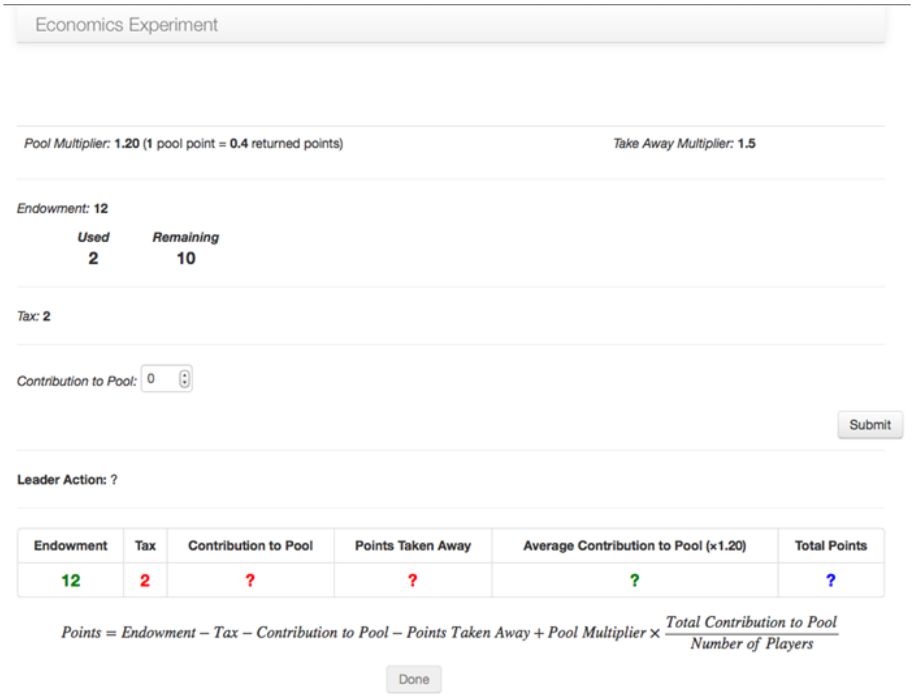
Each point you keep for yourself remains as 1 point. Any points given to the leader, if accepted are kept by the leader. If not accepted by the leader, these points are returned to you. You will be informed of the number of group members after these instructions.

The instructions for each round will be provided before the round begins. You will be given a quiz after the video, which you must answer correctly to continue, so please pay attention. When you are ready, you may watch the first video. When everyone has watched the video and passed the quiz and there are no further questions, the experiment will begin.

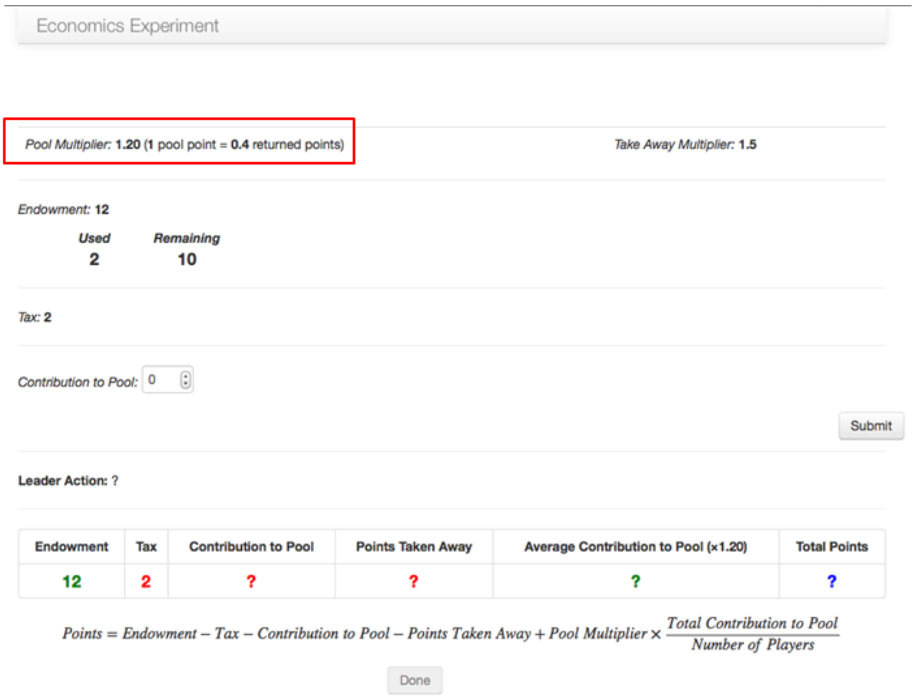
[VERSION B: After all games are completed, you will complete some background questionnaires and measures.]

Control Treatment

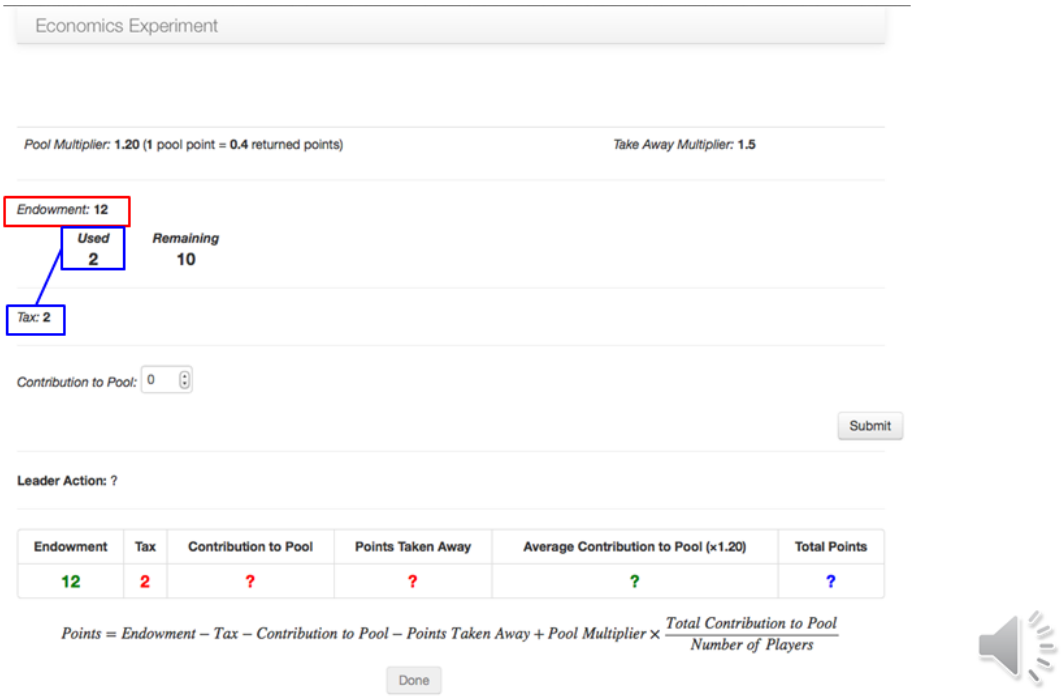
First Round



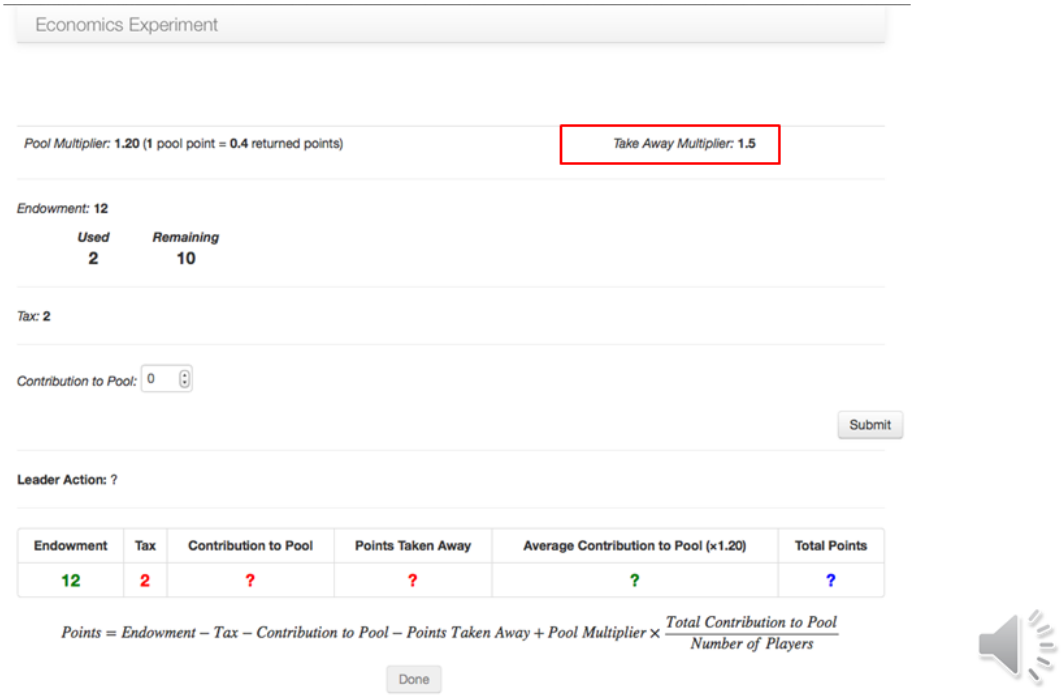
Welcome to the first round. The screen you see in front of you is the normal screen for play. In each period, one person from the group will be selected at random to play the role of a leader. The leader will have a slightly different screen. Please pay attention to all screens presented in these instructions as the instructions for other other rounds will only highlight the differences between that round and this one.



The first thing we'd like to draw your attention to is the pool multiplier. When group members allocate points to the group pool, the total allocated by the group is multipled by this number, the pool multiplier. In this case, it's 1.2. The new total is then distributed equally among everyone in the group, including the leader. This means that if every group member allocated all their points, all group members would increase their earnings by 20%. If no one allocates to the group pool, there's nothing to multiply by 1.2, and nothing to divide up. Another way to think about this is to consider how much each point in the pool is worth to each player. This is shown within parantheses to the right of the pool multiplier. In this case, with 3 players, each player gets 0.4 points for every point in the pool, no matter who contributes it. For example, if each player contributed 1 point pool, there would be 3 points in the pool and each player would get back 3 times 0.4 or 1.2 points.



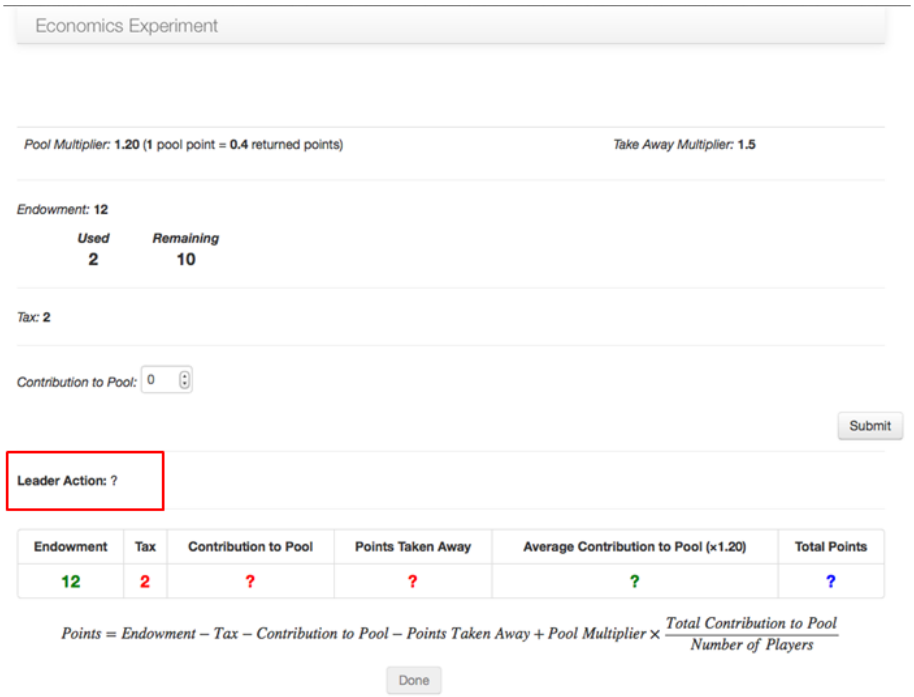
Below this, we see your initial endowment of 12 points. 2 points are taxed each period, which can be used by the leader to take points away from group members. This leaves you 10 points to allocate.



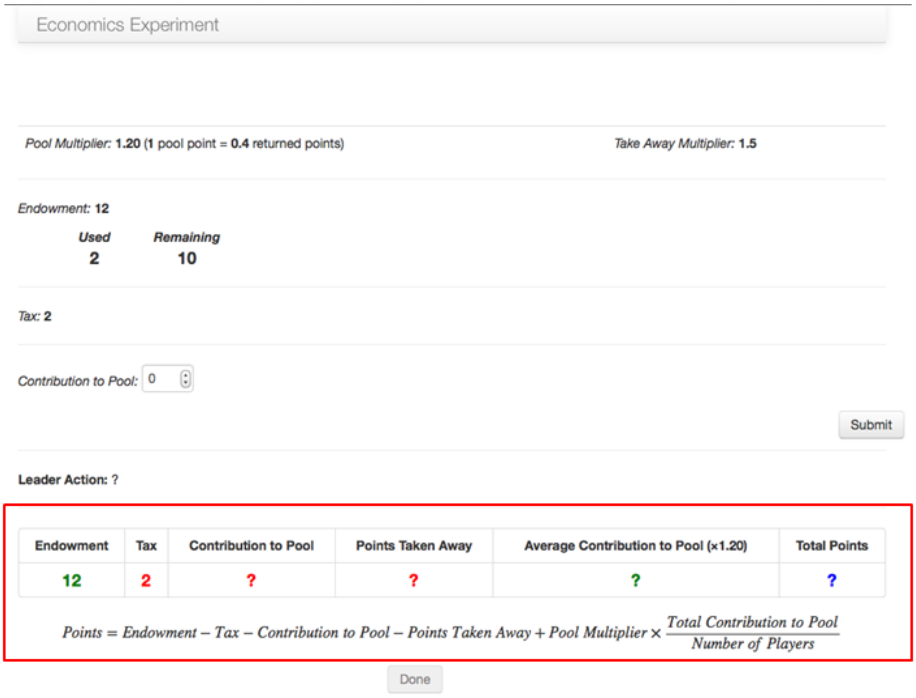
Here you see the Take Away multiplier. This is how much each tax point is multiplied by when the leader takes points away from a group member. For example, here, if the leader spent 1 tax point to take points away, 1.5 points would be taken from the targeted group member.

Here we see the boxes that are used to allocate your remaining 10 points to the group pool. Any points you do not allocate will be kept for yourself. When you hover your mouse over these boxes you will see an arrow to increase or decrease the amount in 1 point intervals or you may type in a value.

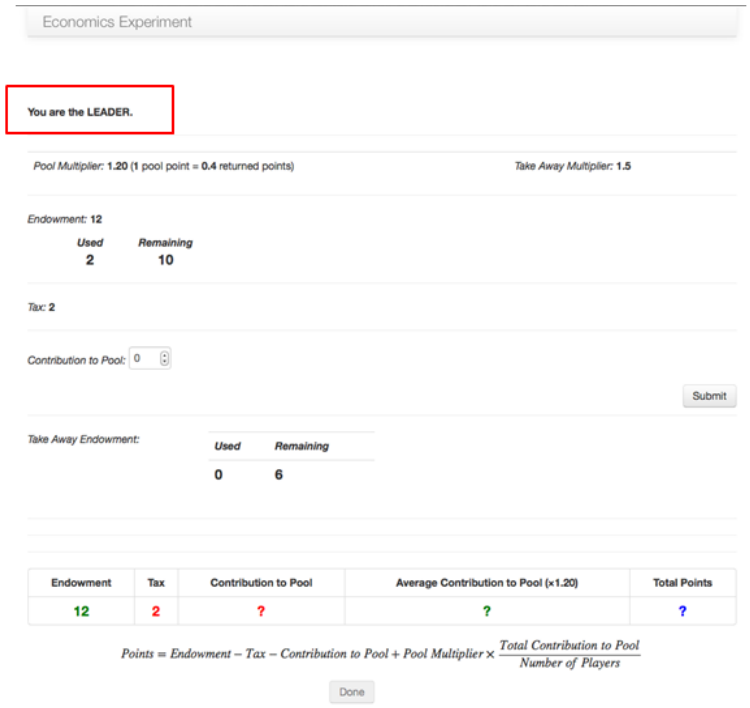
When you have made your decision, click "Submit". After clicking "Submit", you will not be able to change your decision.



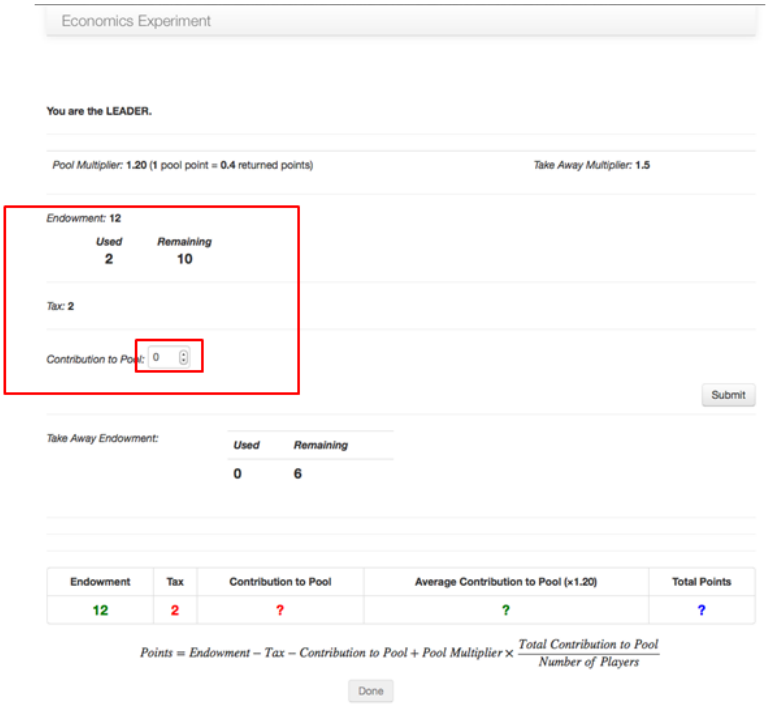
This section will show you the leader's action. The leader has 2 choices – to take points from you or do nothing. They may only choose one of these options.



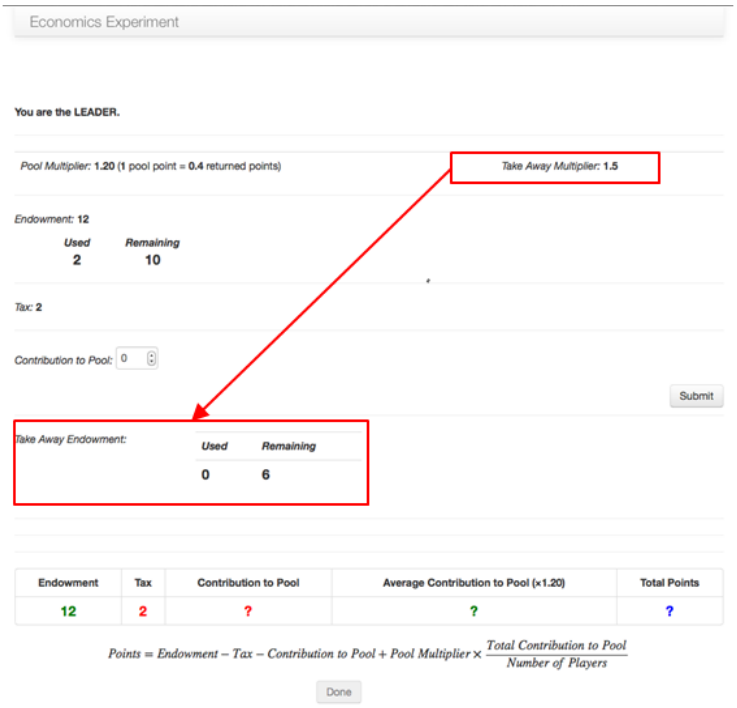
Here you see how your points for this period are calculated. Everything in green is added, everything in red is subtracted, and your total points for the period is shown in blue on the right. We will return to this after explaining the leader's screen.



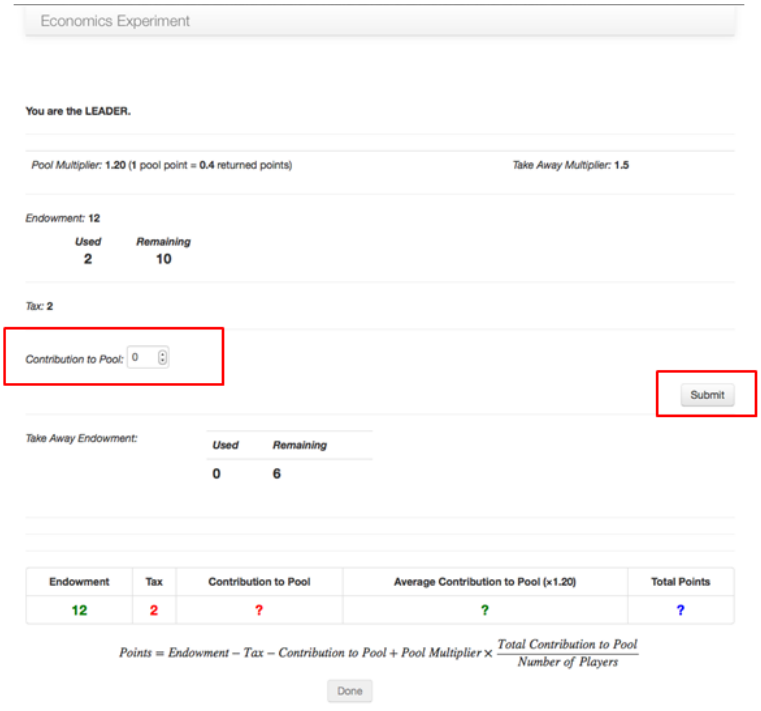
If you are the leader for a period, you will be identified at the top of the screen. Note that all group members, including the leader are anonymous to other group members. Your screen looks very similar to other group members, with a few differences.



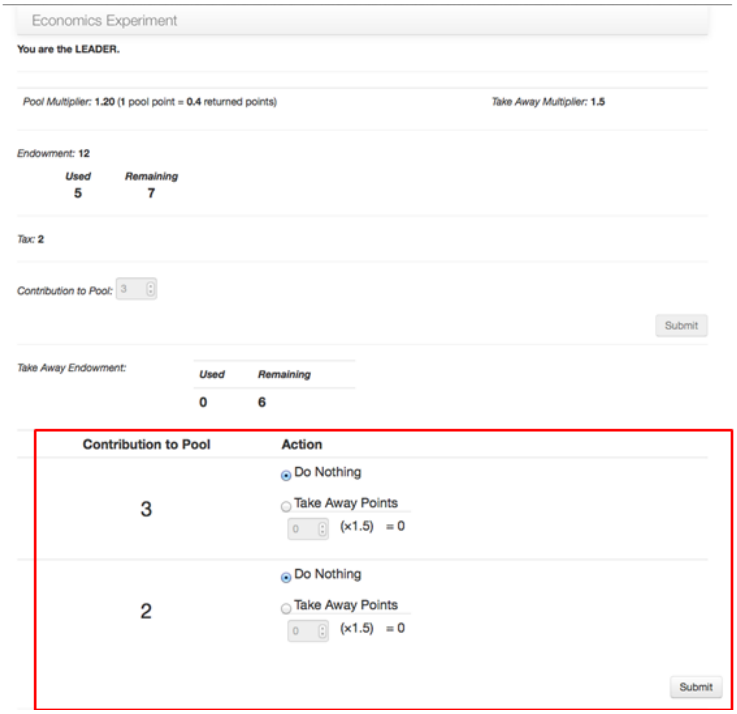
Like other group members you pay a tax and choose how much you wish to allocate to the group pool and how much to keep for yourself



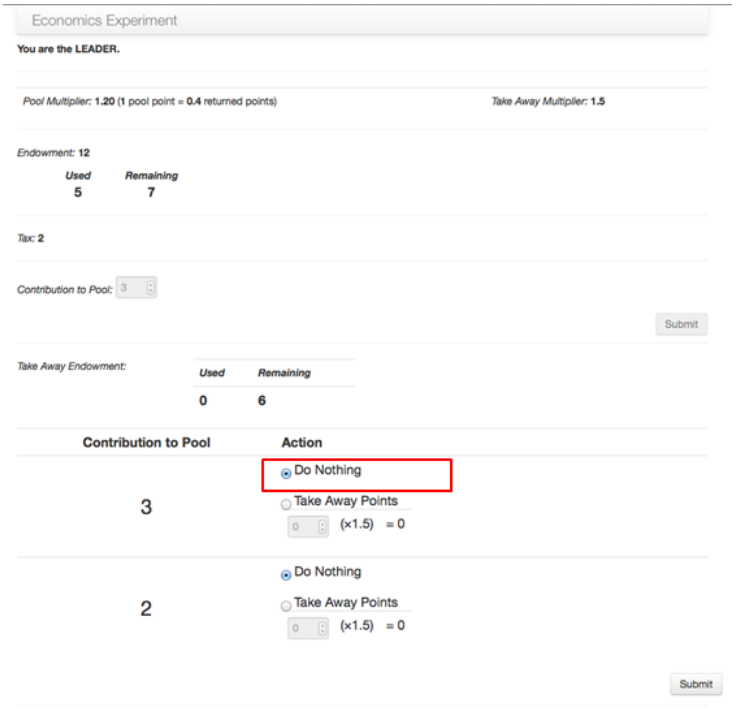
You also have access to tax points that you may use for taking away points from group members based on the Take Away multiplier.



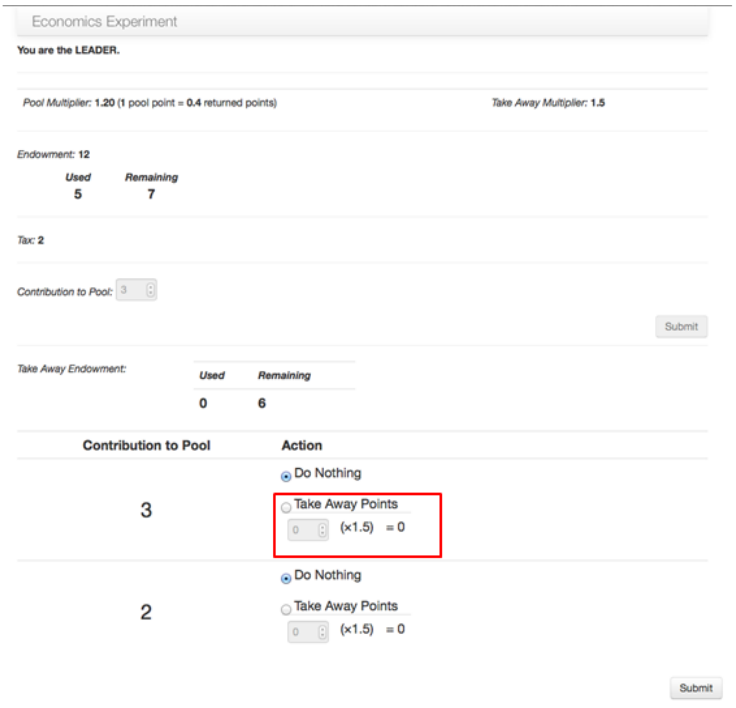
The actions of group members will appear below this after they make their decision. The Contribution column are the contributions to the group pool.



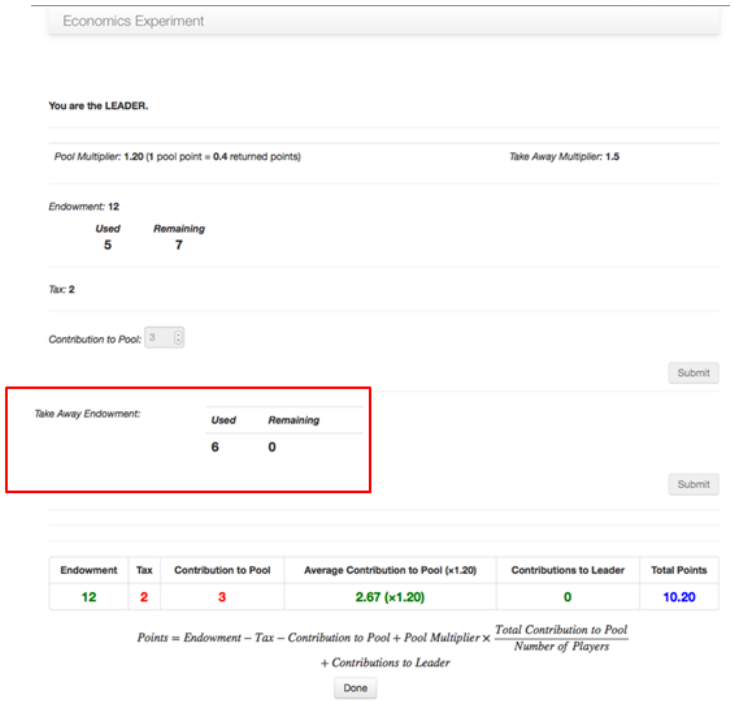
You may…



do nothing…

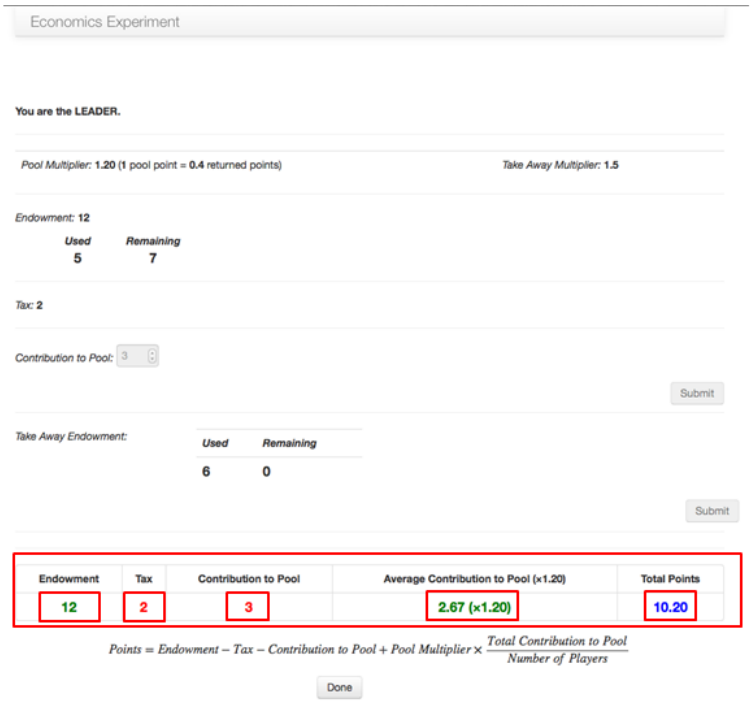


or take points away from any group member. If you take away points, you decide how much to take by allocating tax points to the group member. The total points taken away is calculated for you next to this box.

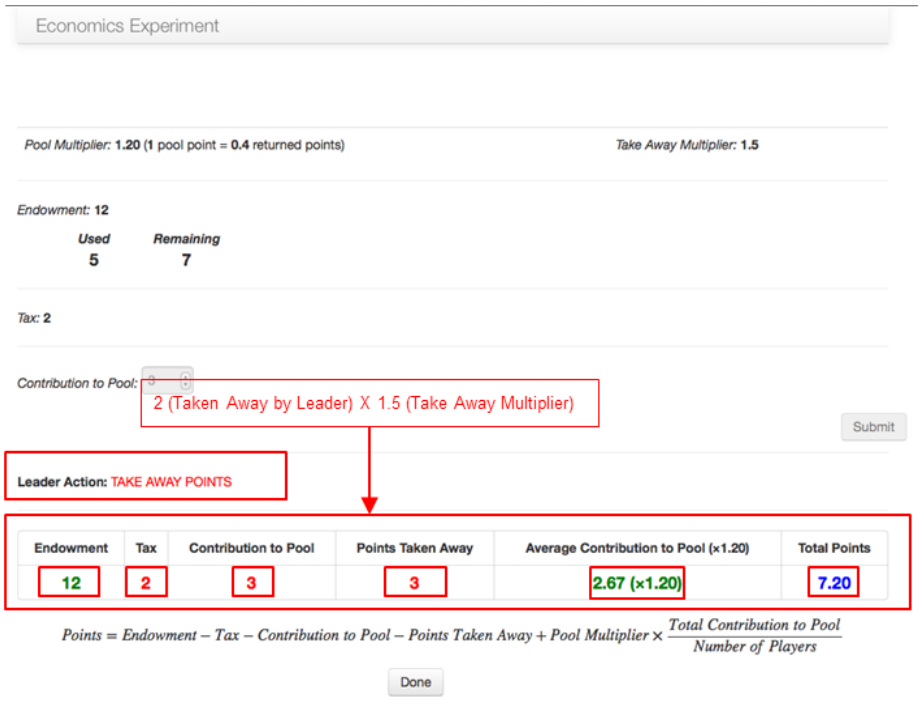


Any tax points not used for taking away points from group members will be returned to the experimenter. Similarly any points taken away from group members will also be returned to the experimenter.

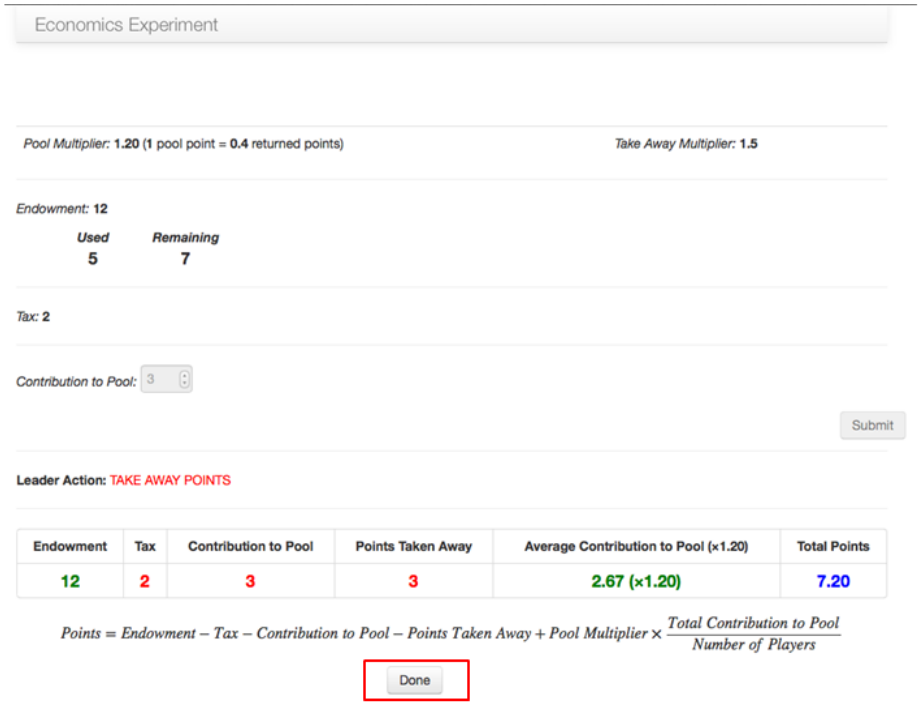
As a leader your earnings for this period are determined by how much you receive from your share of the group pool.



This is your endowment minus your taxes minus your contribution to the pool. The average contribution of group members is shown here – 2.67 points. This is multiplied by the pool multiplier to give the total points for this period – 10.20.



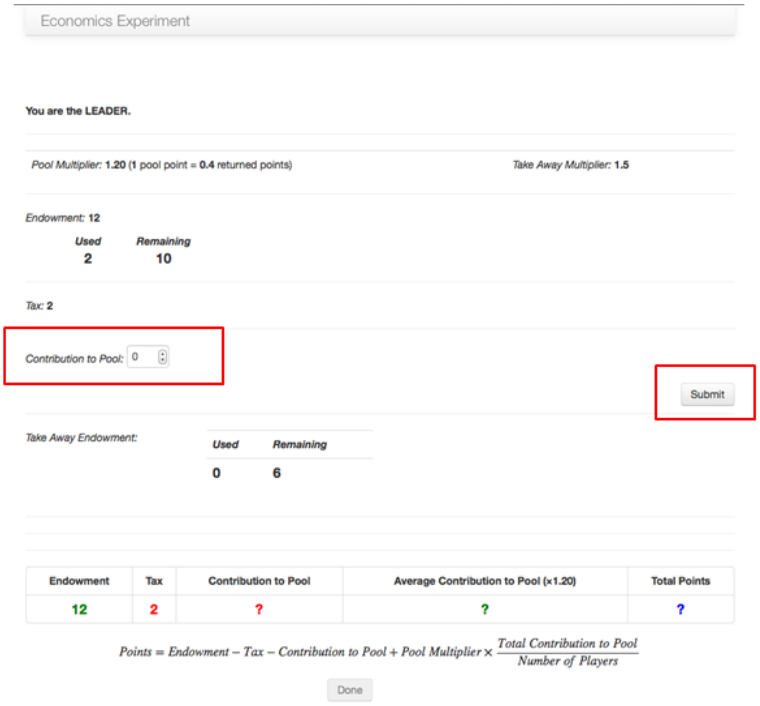
After the leader clicks submit, group members will be informed of the leader's action. The earnings of group members for this period will be calculated from their initial endowment minus their taxes, minus their contribution. Then minus the points taken away by the leader, if any. In the example here, the leader chose to take points away from the group member. Finally, the group members share of the group pool will be added to this amount to calculate the total points for this period. Here the average contribution is shown – 2.67 points. This is multiplied by the pool multiplier and then added to give total points – 7.20 for this group member.



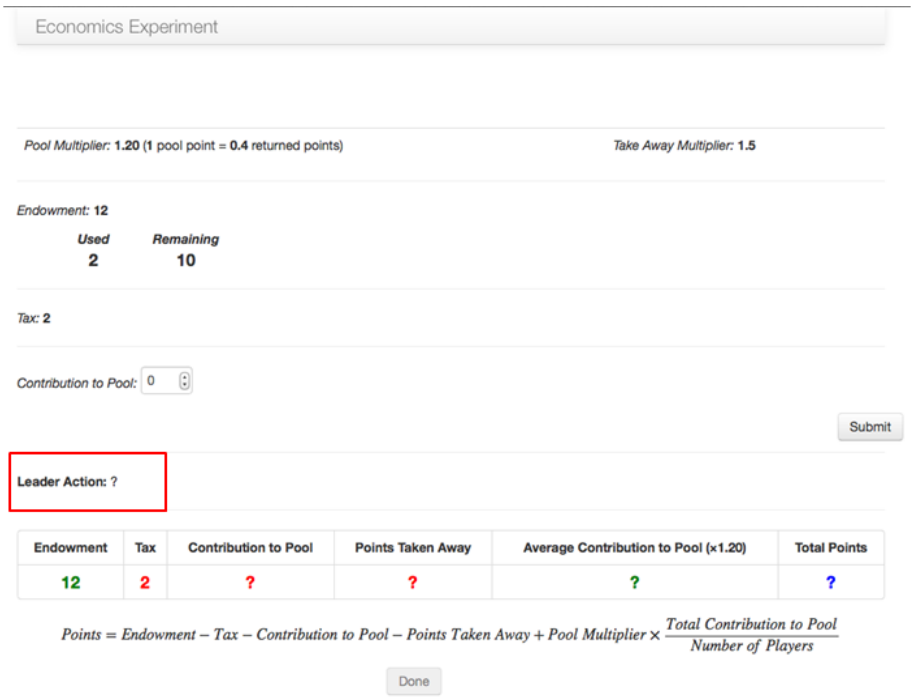
Please click "Done" at the bottom of the screen to move to the next period.

Please click "Continue" when you are ready to begin.

Subsequent Round



The difference between this round and previous rounds is that in this round, like other group members, the leader must choose how much to contribute to the group pool and can not accept any points.



In addition, group members only see the leader's action towards them. They do not see the actions

of others group members or the leader's actions towards other group members. As in all rounds, all participants are completely anonymous.

Please click "Continue" when you are ready to begin.

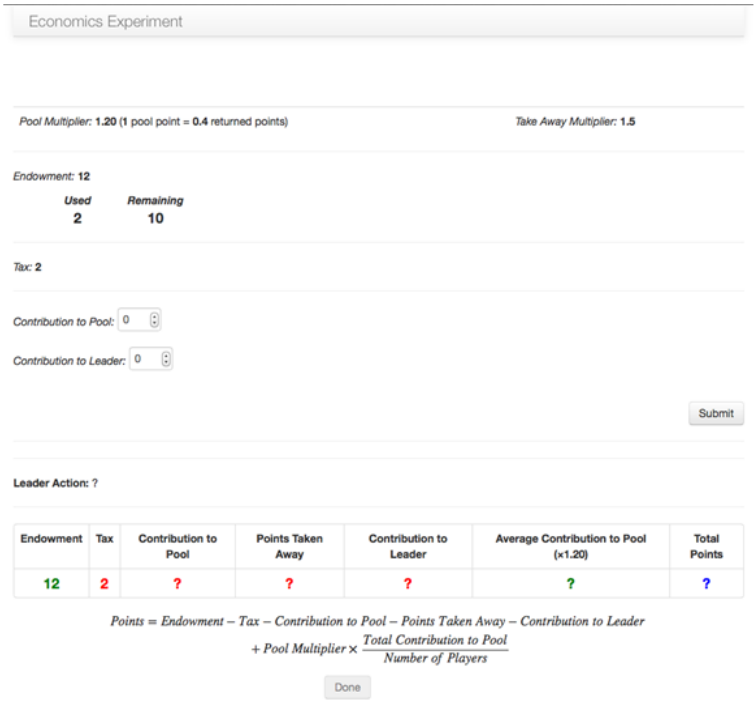
Quiz Questions

(The correct answer is underlined)

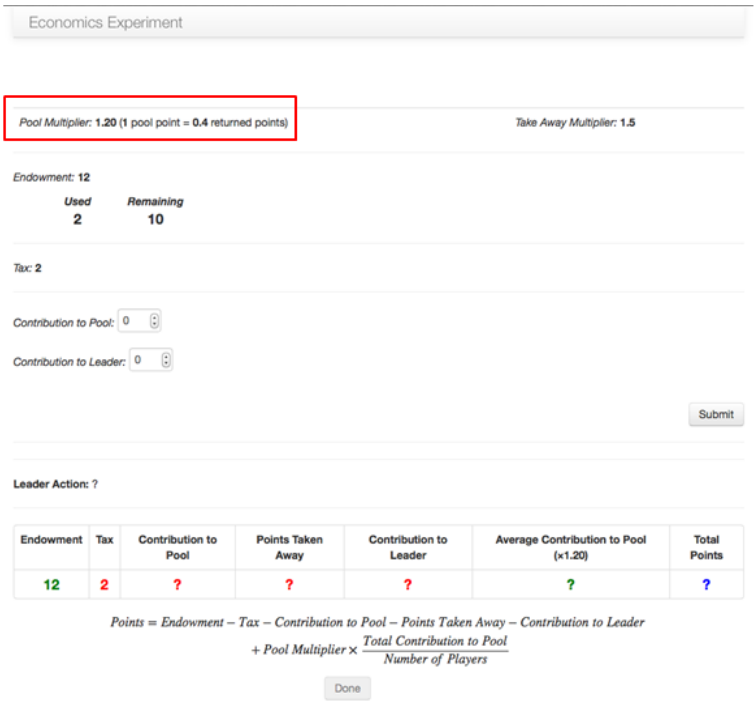
1. How many periods will you play?
    a. 10 periods
    b. More than 10 periods
    c. Less than 10 periods
    d. <u>An average of 10 periods, but possibly more and possibly less</u>
2. If everyone contributes the same amount to the group pool, will you:
    a. <u>Increase your points from your initial endowment</u>
    b. Decrease your points from your initial endowment
    c. Have the same points as your initial endowment
    d. Might increase your points or might decrease your points
3. How much does the leader contribute to the group pool?
    a. <u>However much they choose to allocate to the group pool</u>
    b. 10 points
    c. Depends on the points given to the leader
    d. Depends on the group member's contributions
4. Which of the following can the leader NOT do?
    a. Nothing
    b. <u>Accept points from a group member</u>
    c. Take points away from a group member
    d. Accept points and take points away from the same group member
5. What actions of other group members can group members (not leader) see?
    a. <u>Leader's action towards them</u>
    b. Leader's contribution
    c. Leader's contribution and all actions
    d. All group member and leader actions

Bribery Game

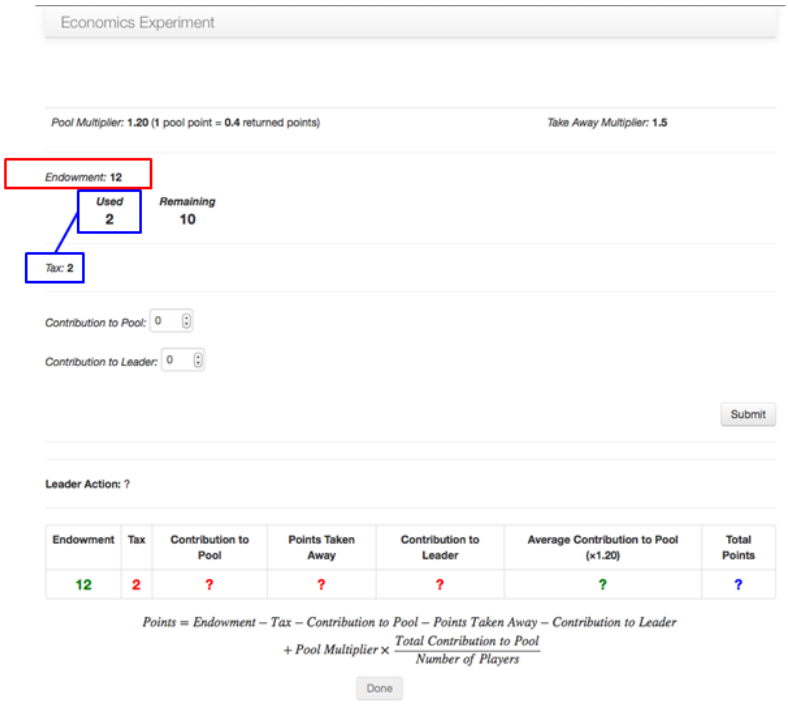
First Round



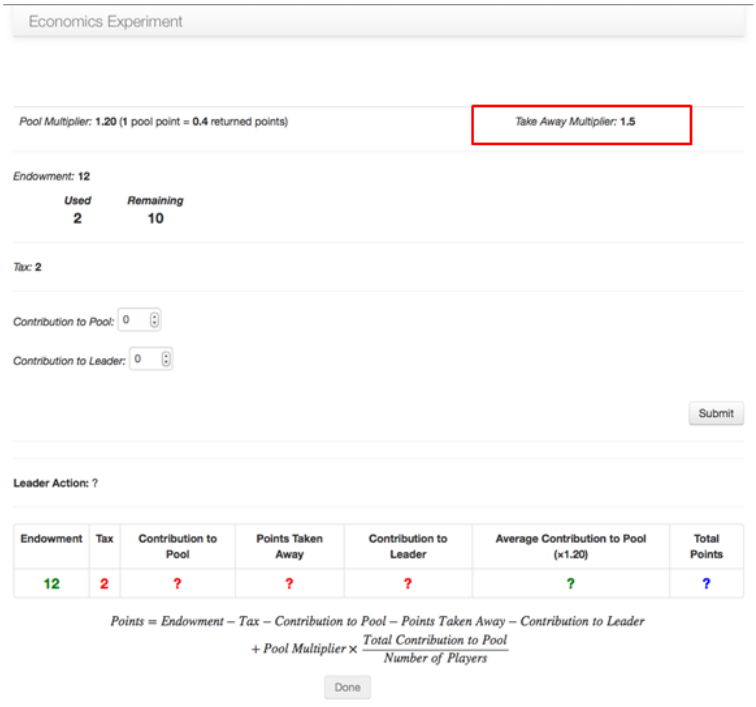
Welcome to the first round. The screen you see in front of you is the normal screen for play. In each period, one person from the group will be selected at random to play the role of a leader. The leader will have a slightly different screen. Please pay attention to all screens presented in these instructions as the instructions for other other rounds will only highlight the differences between that round and this one.



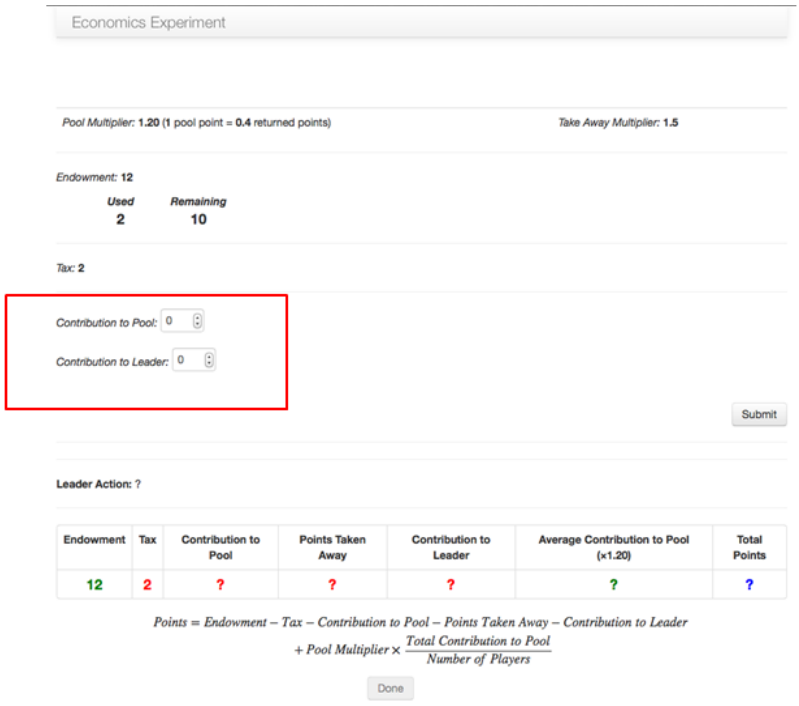
The first thing we'd like to draw your attention to is the pool multiplier. When group members allocate points to the group pool, the total allocated by the group is multipled by this number, the pool multiplier. In this case, it's 1.2. The new total is then distributed equally among everyone in the group, including the leader. This means that if every group member allocated all their points, all group members would increase their earnings by 20%. If no one allocates to the group pool, there's nothing to multiply by 1.2, and nothing to divide up. Another way to think about this is to consider how much each point in the pool is worth to each player. This is shown within parantheses to the right of the pool multiplier. In this case, with 3 players, each player gets 0.4 points for every point in the pool, no matter who contributes it. For example, if each player contributed 1 point pool, there would be 3 points in the pool and each player would get back 3 times 0.4 or 1.2 points.



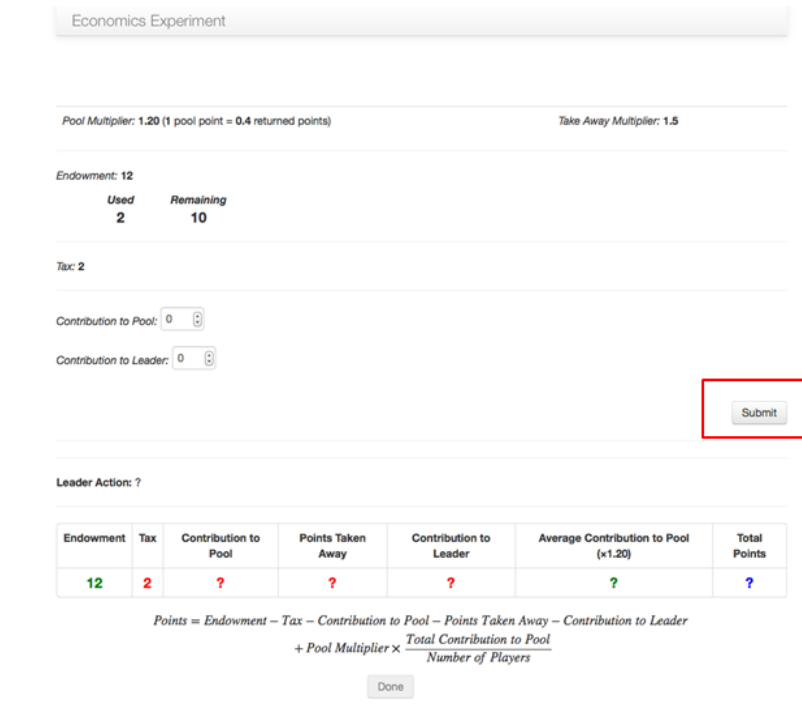
Below this, we see your initial endowment of 12 points. 2 points are taxed each period, which can be used by the leader to take points away from group members. This leaves you 10 points to allocate.



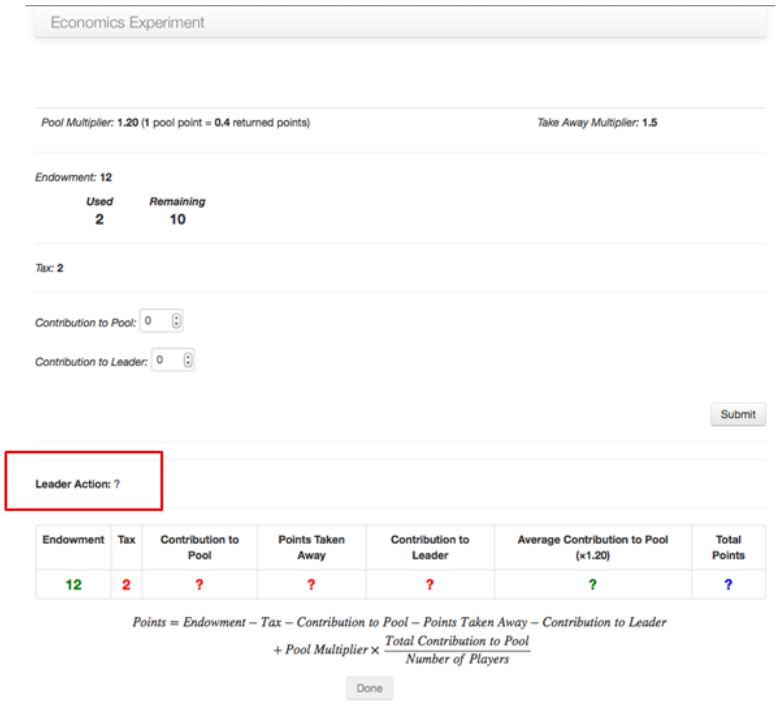
Here you see the Take Away multiplier. This is how much each tax point is multiplied by when the leader takes points away from a group member. For example, here, if the leader spent 1 tax point to take points away, 1.5 points would be taken from the targeted group member.



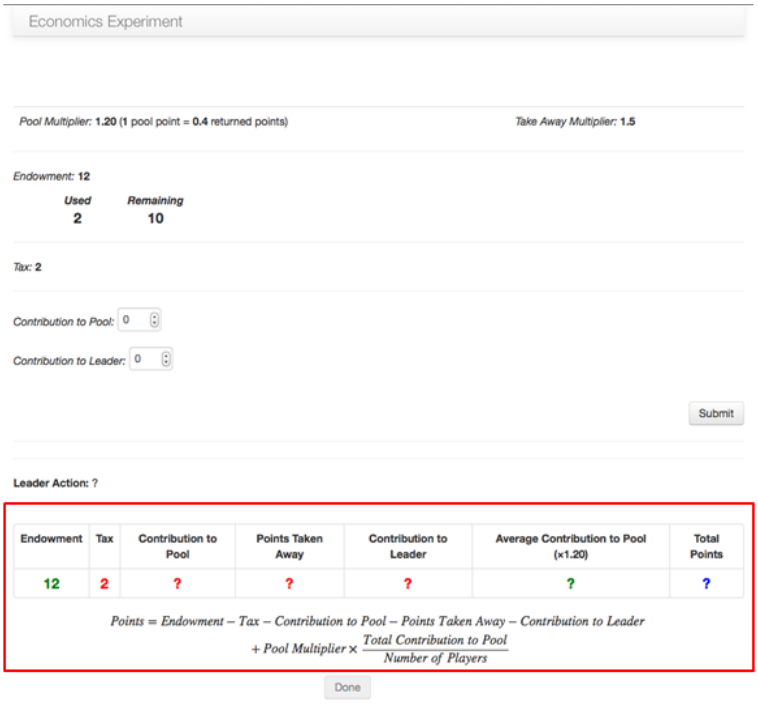
Here we see the boxes that are used to allocate your remaining 10 points to either the group pool or to the leader. Any points you do not allocate will be kept for yourself. When you hover your mouse over these boxes you will see an arrow to increase or decrease the amount in 1 point intervals or you may type in a value.



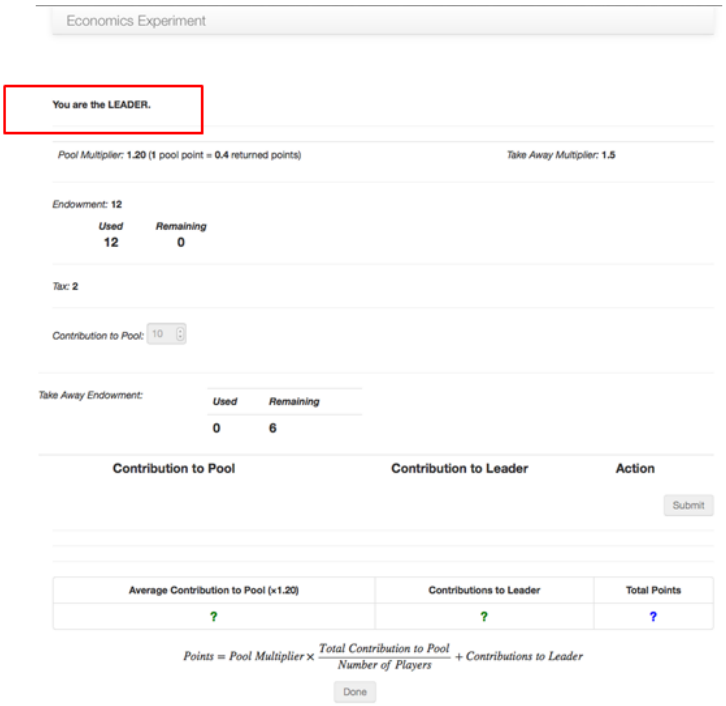
When you have made your decision, click "Submit". After clicking "Submit", you will not be able to change your decision.



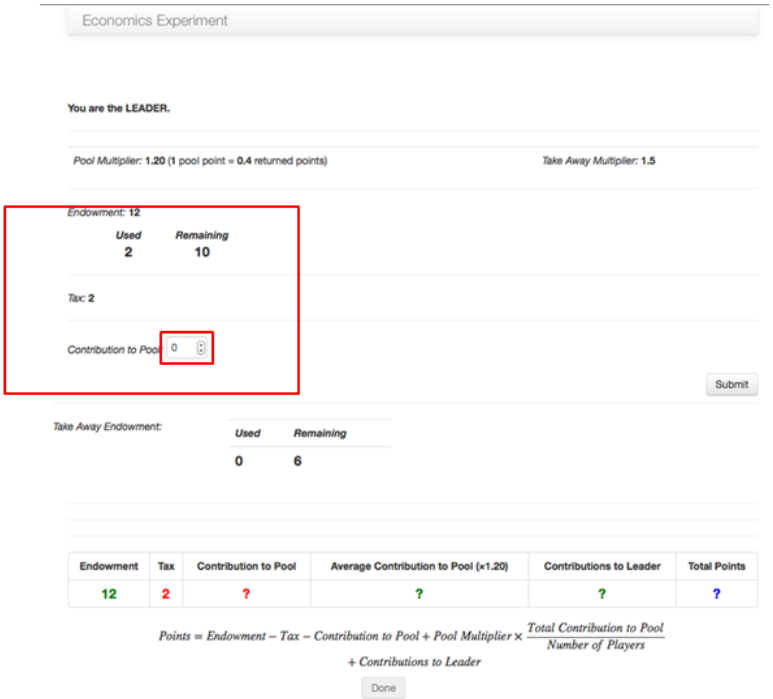
This section will show you the leader's action. The leader has 3 choices – to take points from you, accept your points, or do nothing. They may only choose one of these options.



Here you see how your points for this period are calculated. Everything in green is added, everything in red is subtracted, and your total points for the period is shown in blue on the right. We will return to this after explaining the leader's screen.

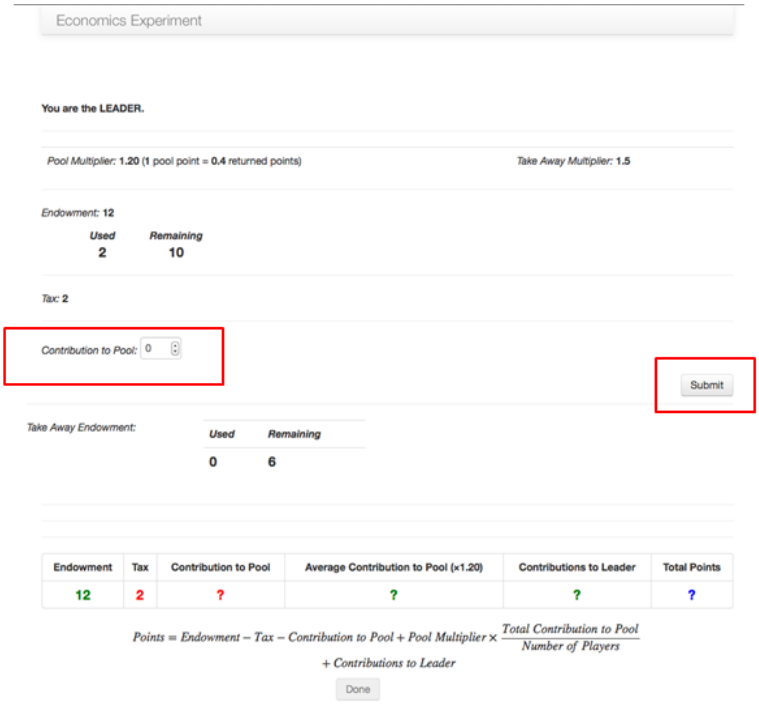


If you are the leader for a period, you will be identified at the top of the screen. Note that all group members, including the leader are anonymous to other group members. Your screen looks very similar to other group members, with a few differences.

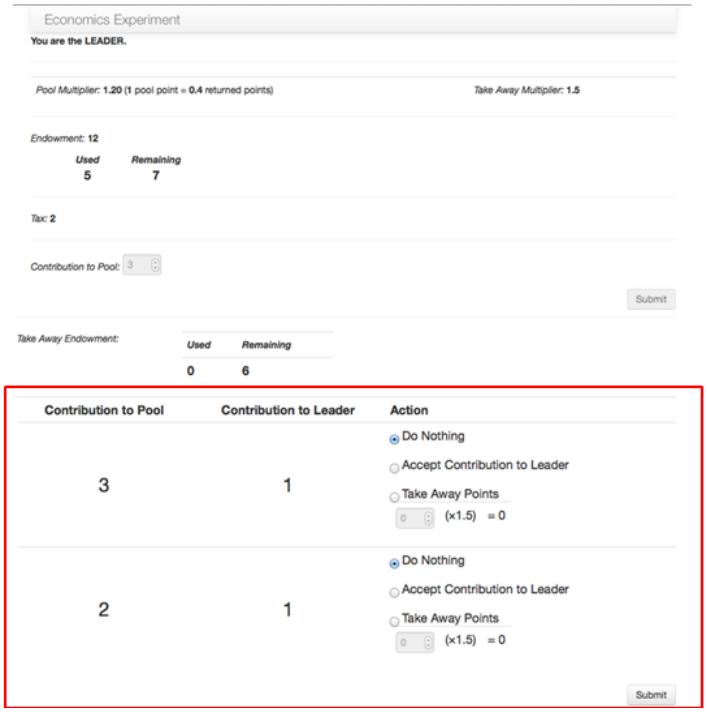


Like other group members you pay a tax and choose how much you wish to allocate to the group pool and how much to keep for yourself, but, unlike other group members you do not contribute to the leader, since you are the leader and you would be contributing to yourself.

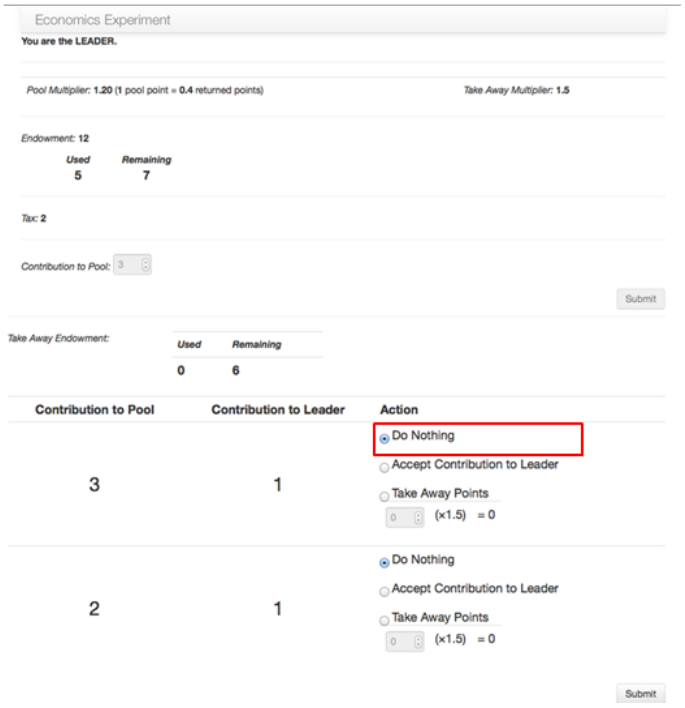
You also have access to tax points that you may use for taking away points from group members based on the Take Away multiplier.



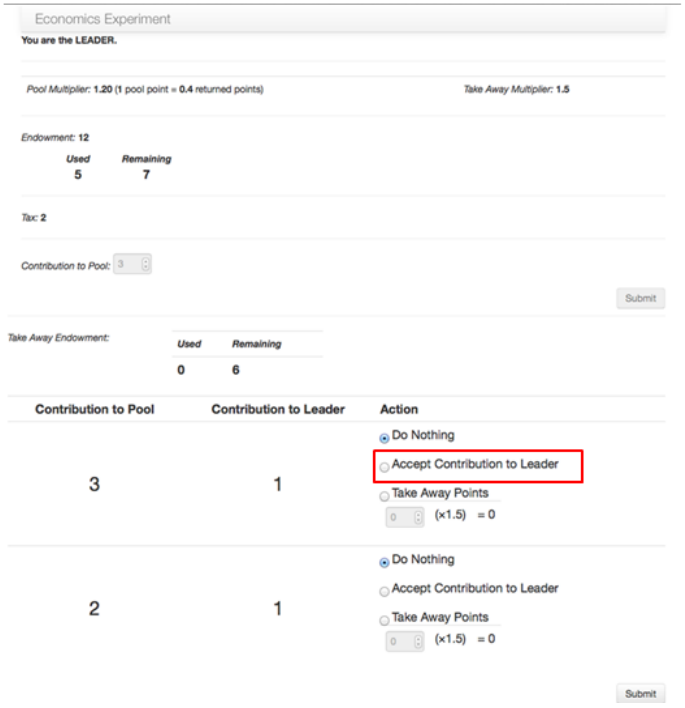
When you have made your decision about how many points to allocate to the group pool, click "Submit". After clicking "Submit", you will not be able to change your decision.



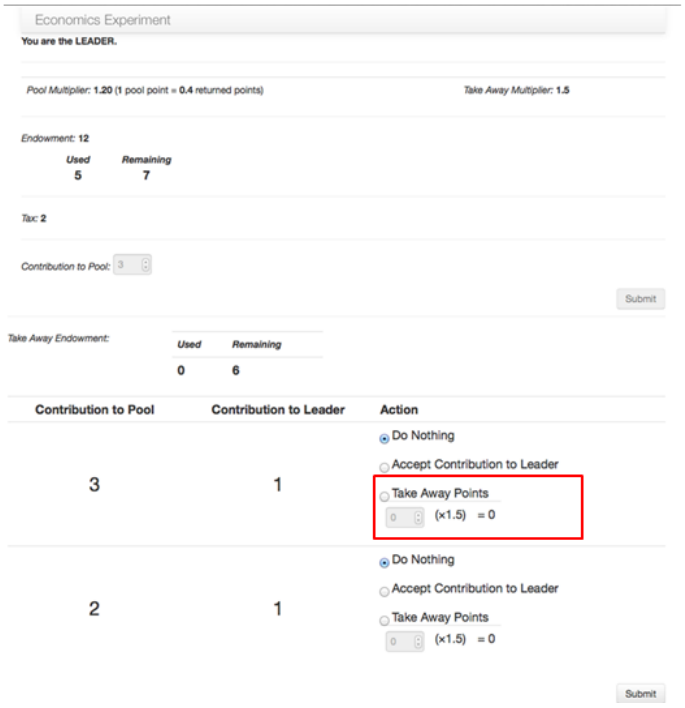
The actions of group members will appear below this after they make their decision. The Contribution column are the contributions to the group pool and the Payment column shows points given to you, the Leader.



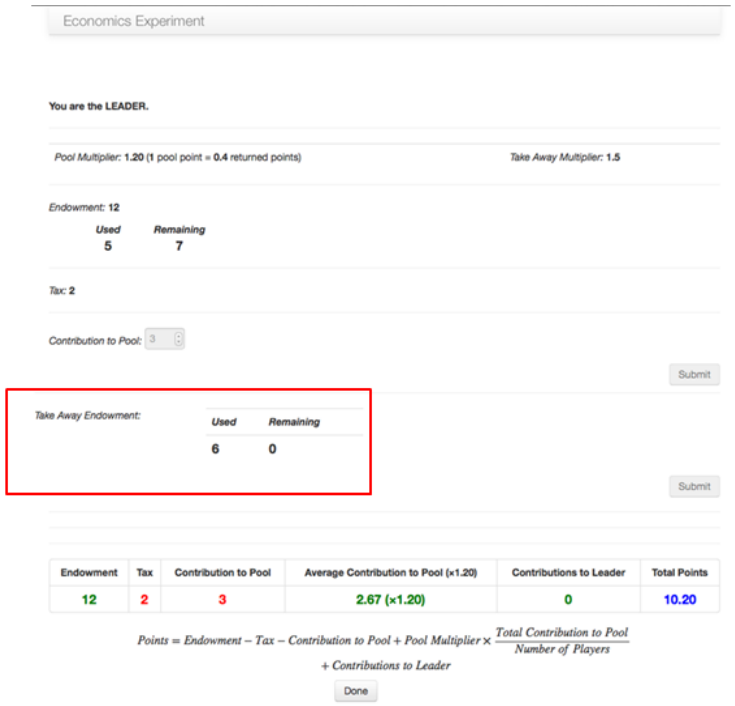
You may do nothing…



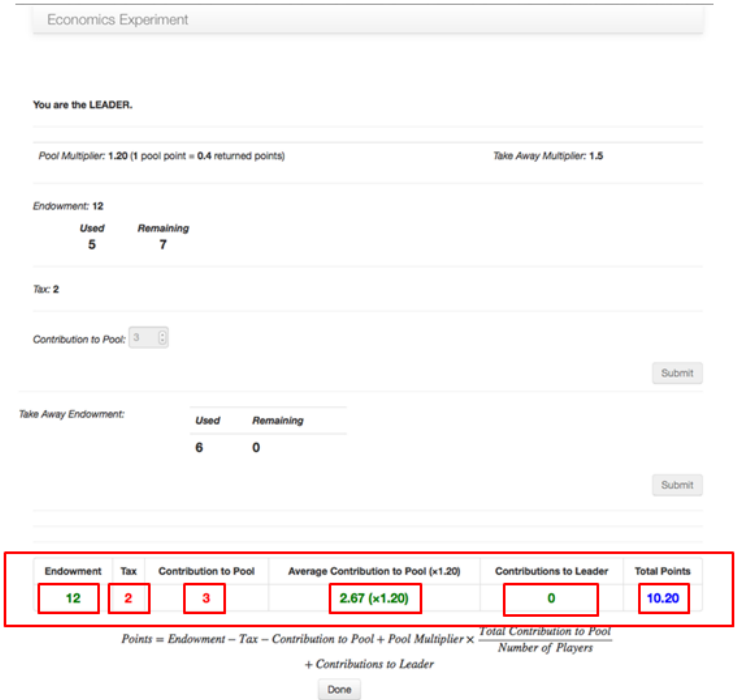
accept these points…



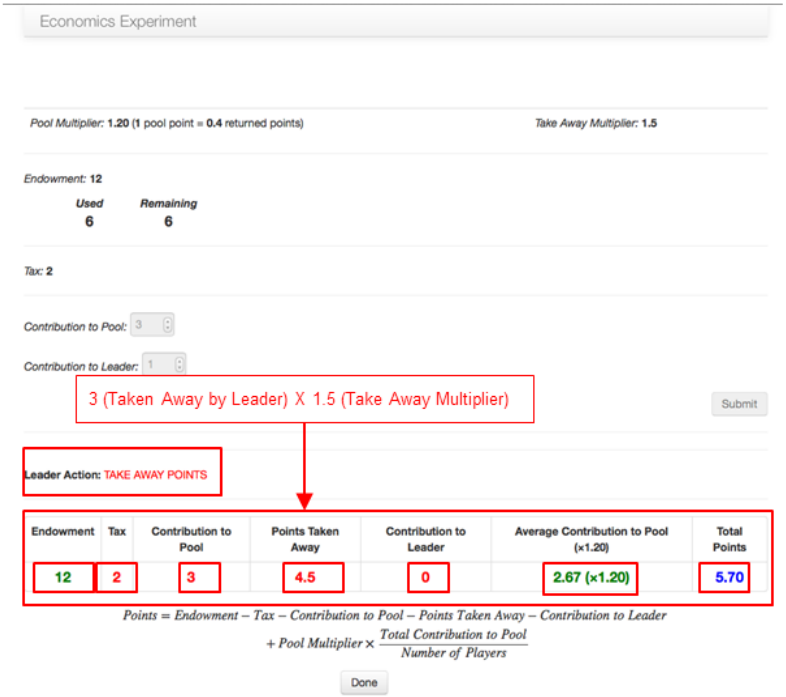
or take points away from any group member. If you take away points, you decide how much to take by allocating tax points to the group member. The total points taken away is calculated for you next to this box.



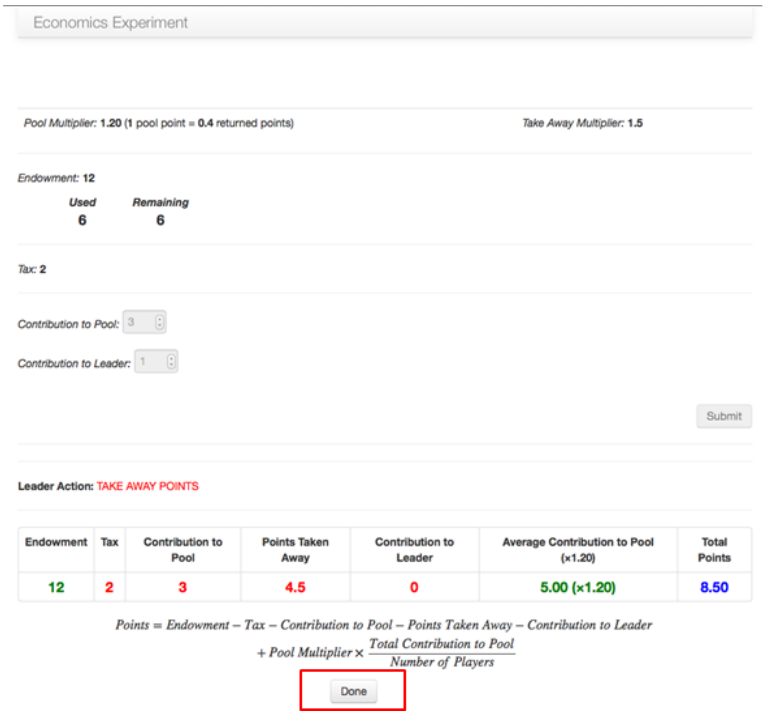
Any tax points not used for taking away points from group members will be returned to the experimenter. Similarly any points taken away from group members will also be returned to the experimenter.



As a leader your earnings for this period will be calculated from your initial endowment minus your taxes, minus your contribution, plus the average contribution to the pool – 2.67, multiplied by the pool multiplier, plus any points you accepted, giving you a total of 10.2 for this period.



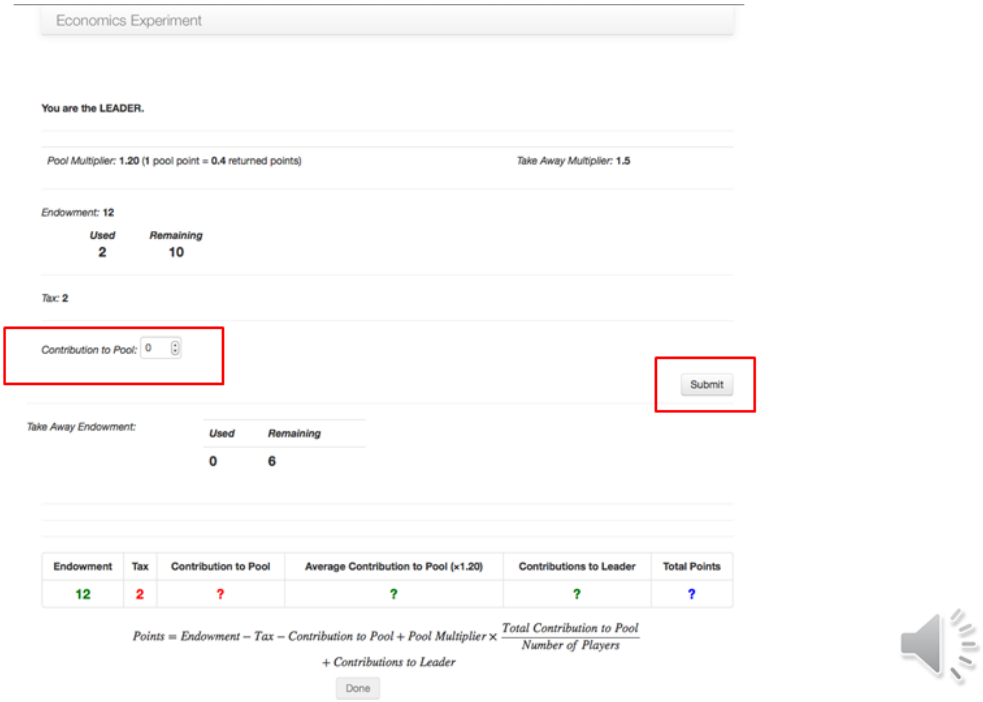
After the leader clicks submit, group members will be informed of the leader's action. The earnings of group members for this period will be calculated from their initial endowment minus their taxes, minus their contribution. Then either minus the points taken away by the leader OR minus the points given to the leader. Any points given to the leader and not accepted will be returned to the group member. In the example here, the leader chose to take points away from the group member. Finally, the group members share of the group pool will be added to this amount to calculate the total points for this period. Here the average contribution is shown – 2.67 points. This is multiplied by the pool multiplier and then added to give total points – 5.7 for this group member.



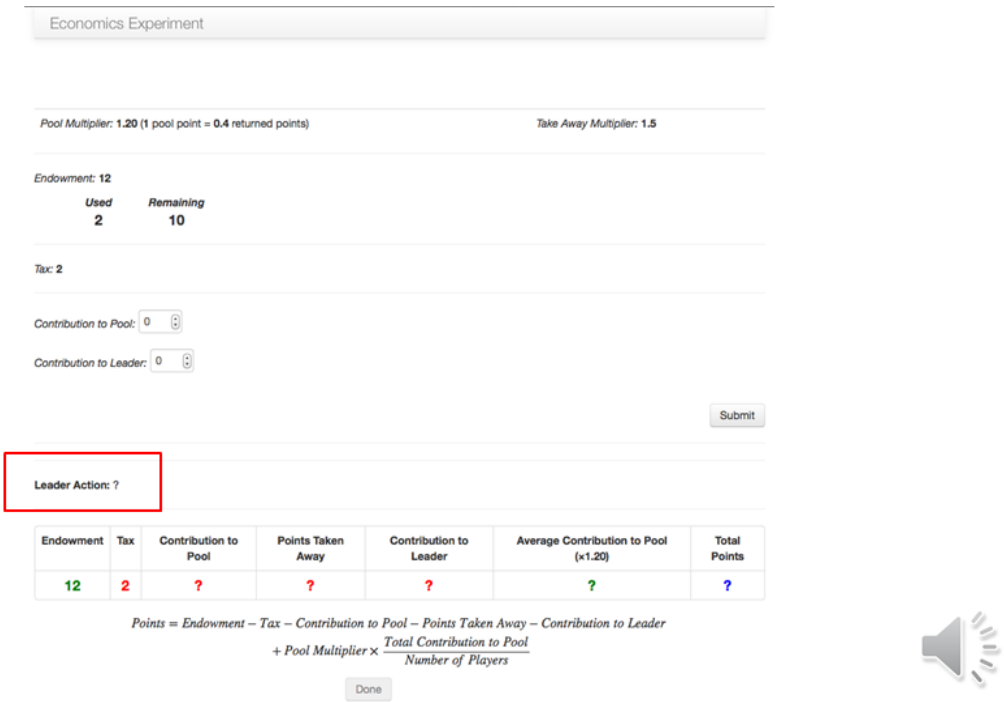
Please click "Done" at the bottom of the screen to move to the next period.

Please click "Continue" when you are ready to begin.

Subsequent Round



The difference between this round and previous rounds is that in this round, like other group members, the leader must choose how much to contribute to the group pool. They may also accept points from group members.



In addition, group members only see the leader's action towards them. They do not see the actions

of others group members or the leader's actions towards other group members. As in all rounds, all participants are completely anonymous.

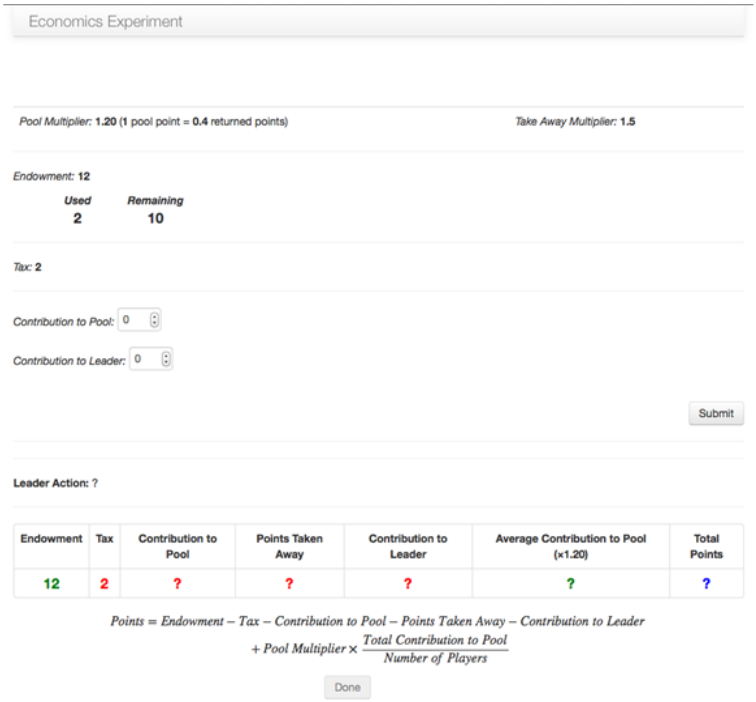
Please click "Continue" when you are ready to begin.

Quiz Questions

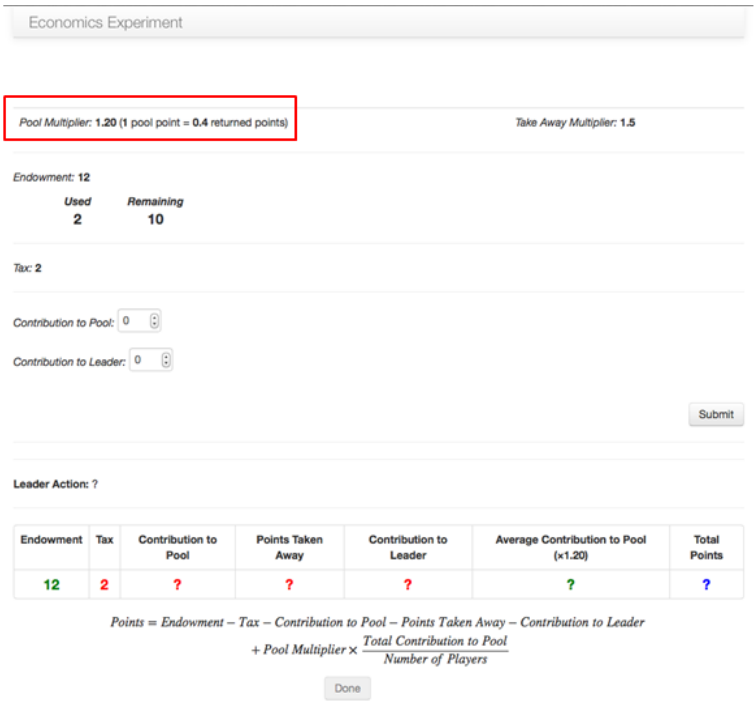
1. How many periods will you play?
    a. 10 periods
    b. More than 10 periods
    c. Less than 10 periods
    d. An average of 10 periods, but possibly more and possibly less
2. If everyone contributes the same amount to the group pool, will you:
    a. Increase your points from your initial endowment
    b. Decrease your points from your initial endowment
    c. Have the same points as your initial endowment
    d. Might increase your points or might decrease your points
3. How much does the leader contribute to the group pool?
    a. However much they choose to allocate to the group pool
    b. 10 points
    c. Depends on the points given to the leader
    d. Depends on the group member's contributions
4. Which of the following can the leader NOT do?
    a. Nothing
    b. Accept points from a group member
    c. Take points away from a group member
    d. Accept points and take points away from the same group member
5. If a leader does not accept points where do these points go?
    a. Goes to the leader anyway
    b. Goes back to the group member
    c. Goes to the experimenter
    d. Is added to the group pool
6. What actions of other group members can group members (not leader) see?
    a. Leader's action towards them
    b. Leader's contribution
    c. Leader's contribution and all actions
    d. All group member and leader actions

Bribery Game with Partial Transparency

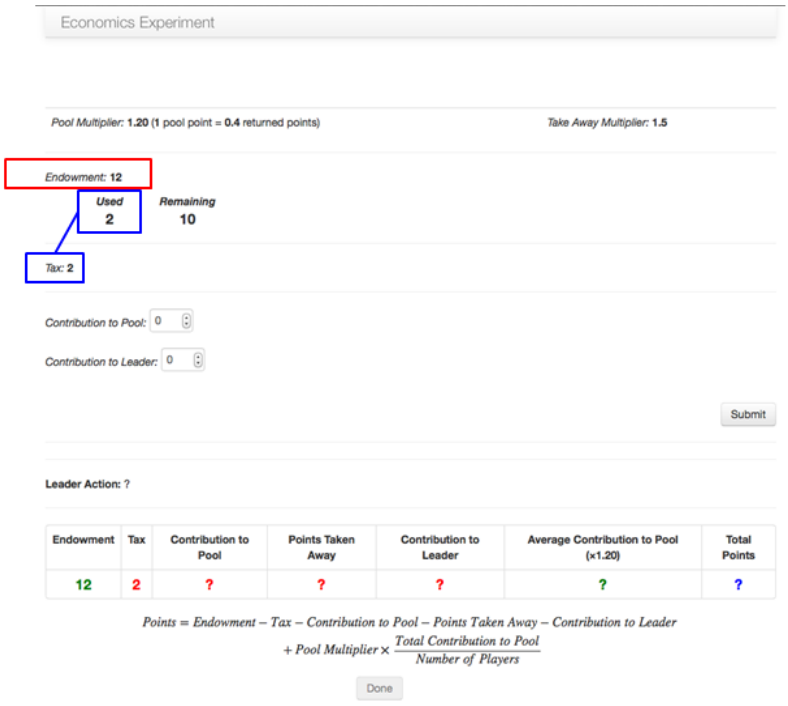
First Round



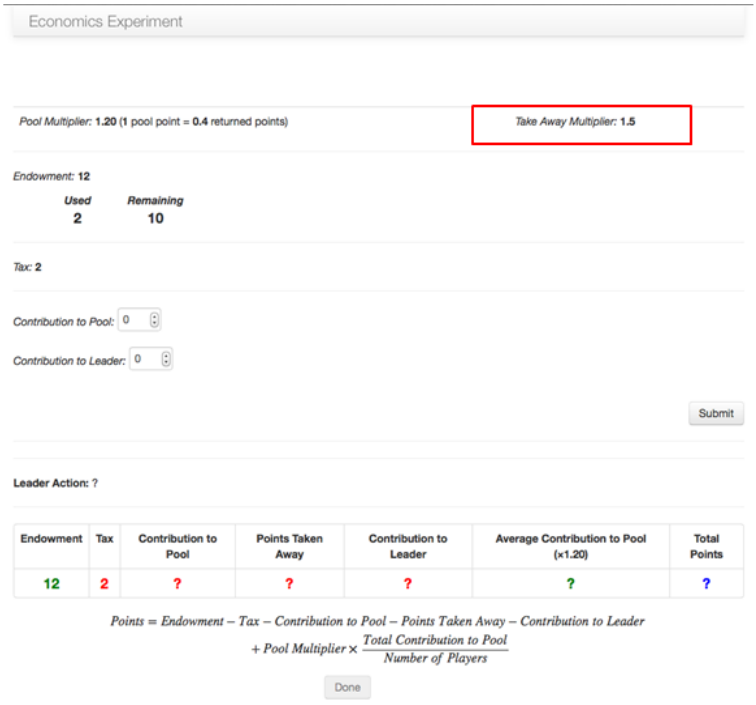
Welcome to the first round. The screen you see in front of you is the normal screen for play. In each period, one person from the group will be selected at random to play the role of a leader. The leader will have a slightly different screen. Please pay attention to all screens presented in these instructions as the instructions for other other rounds will only highlight the differences between that round and this one.



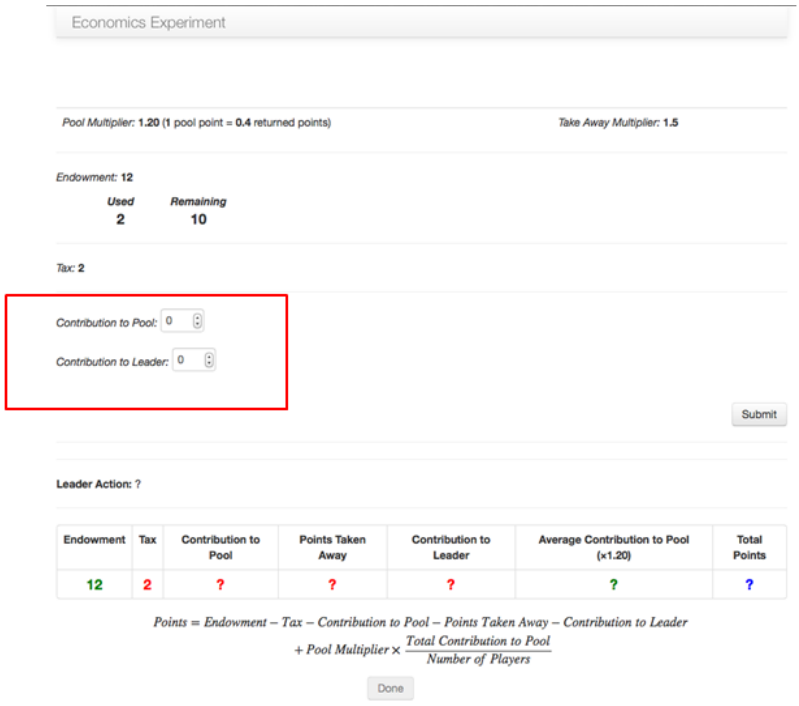
The first thing we'd like to draw your attention to is the pool multiplier. When group members allocate points to the group pool, the total allocated by the group is multipled by this number, the pool multiplier. In this case, it's 1.2. The new total is then distributed equally among everyone in the group, including the leader. This means that if every group member allocated all their points, all group members would increase their earnings by 20%. If no one allocates to the group pool, there's nothing to multiply by 1.2, and nothing to divide up. Another way to think about this is to consider how much each point in the pool is worth to each player. This is shown within parantheses to the right of the pool multiplier. In this case, with 3 players, each player gets 0.4 points for every point in the pool, no matter who contributes it. For example, if each player contributed 1 point pool, there would be 3 points in the pool and each player would get back 3 times 0.4 or 1.2 points.



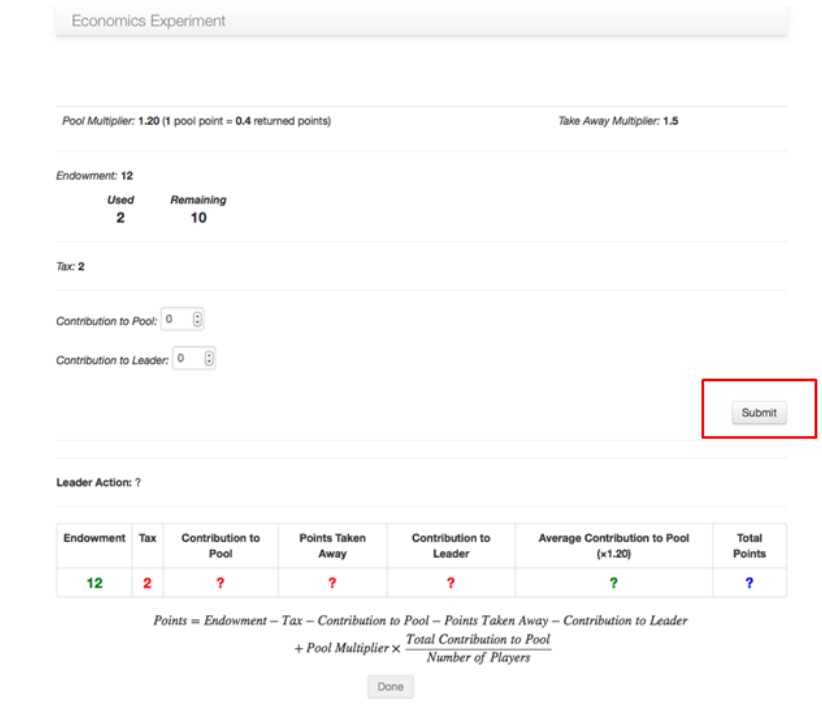
Below this, we see your initial endowment of 12 points. 2 points are taxed each period, which can be used by the leader to take points away from group members. This leaves you 10 points to allocate.



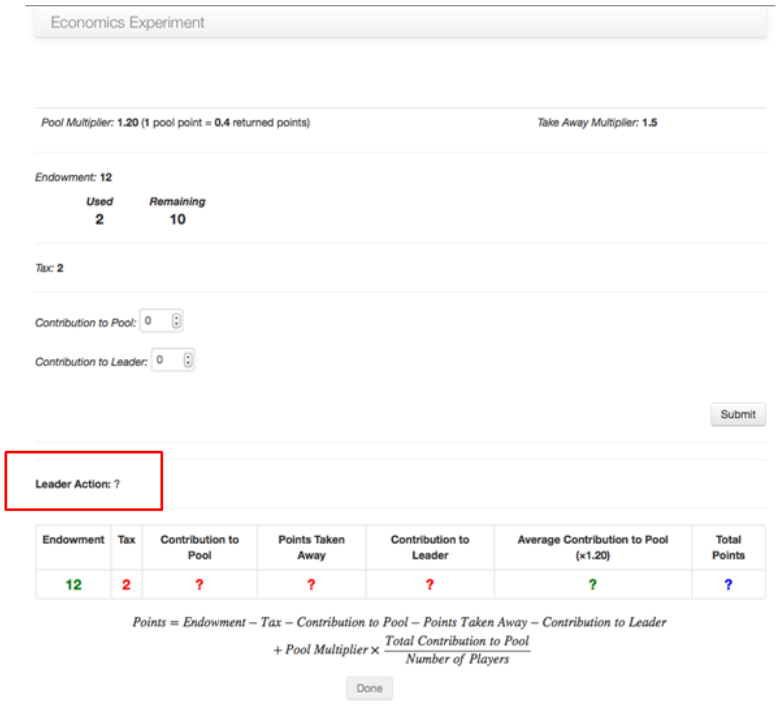
Here you see the Take Away multiplier. This is how much each tax point is multiplied by when the leader takes points away from a group member. For example, here, if the leader spent 1 tax point to take points away, 1.5 points would be taken from the targeted group member.



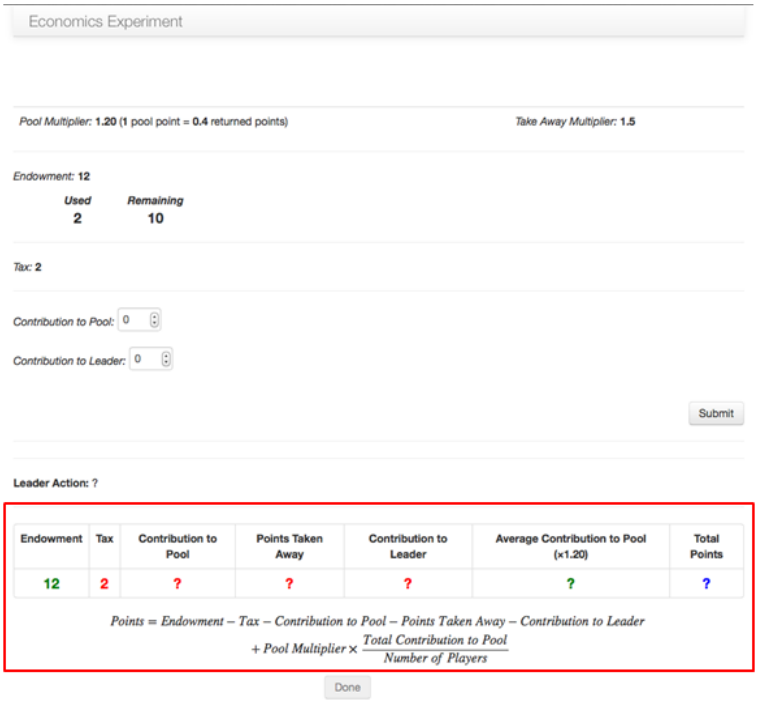
Here we see the boxes that are used to allocate your remaining 10 points to either the group pool or to the leader. Any points you do not allocate will be kept for yourself. When you hover your mouse over these boxes you will see an arrow to increase or decrease the amount in 1 point intervals or you may type in a value.



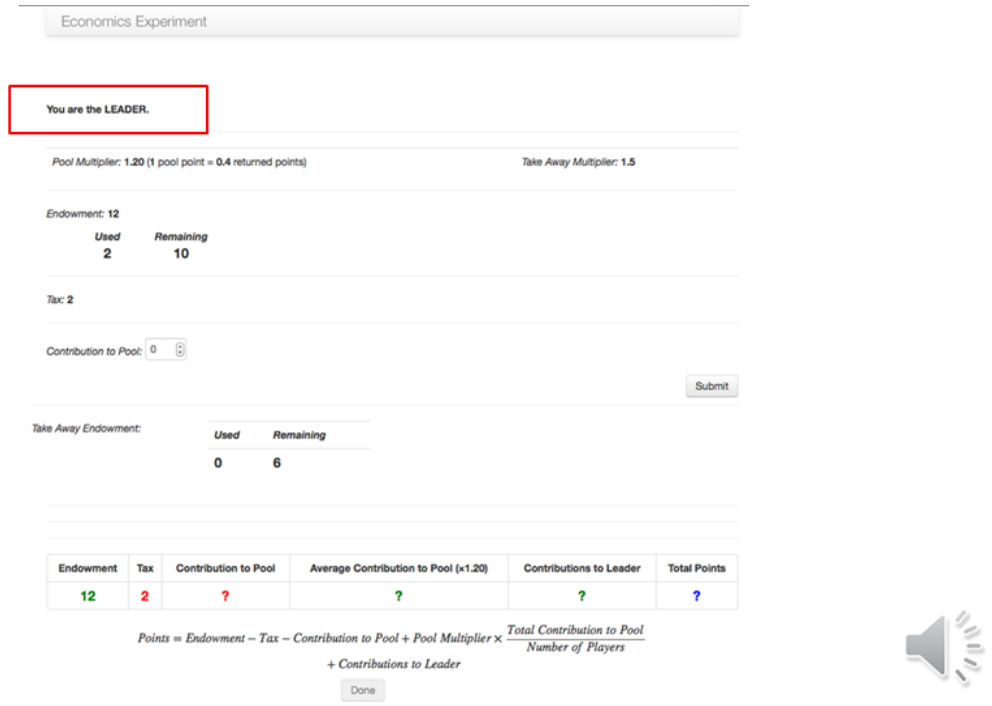
When you have made your decision, click "Submit". After clicking "Submit", you will not be able to change your decision.



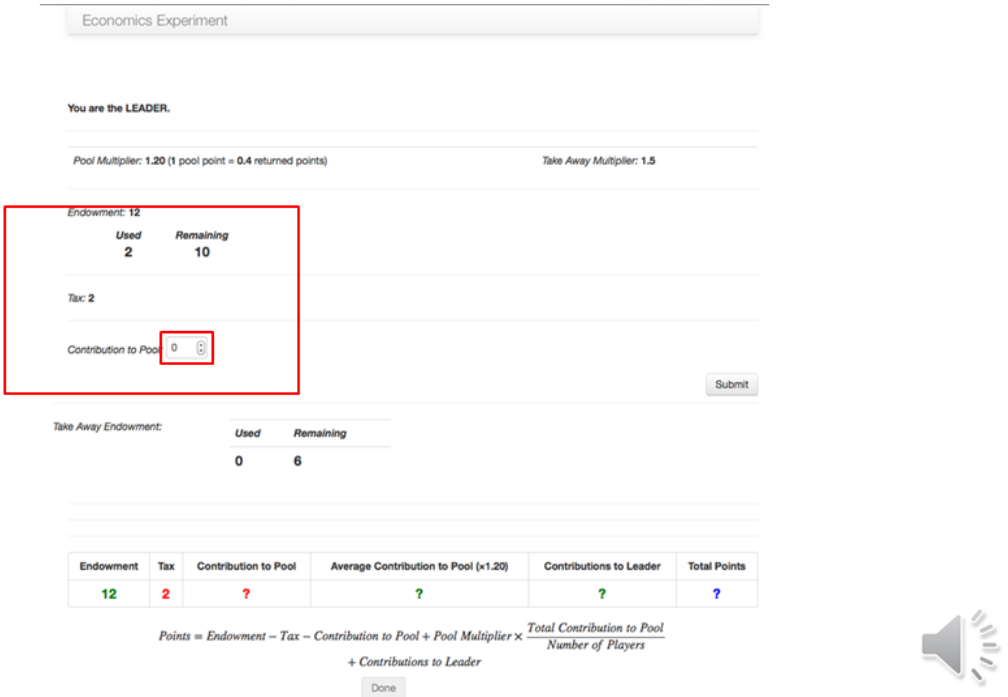
This section will show you the leader's action. The leader has 3 choices – to take points from you, accept your points, or do nothing. They may only choose one of these options.



Here you see how your points for this period are calculated. Everything in green is added, everything in red is subtracted, and your total points for the period is shown in blue on the right. We will return to this after explaining the leader's screen.

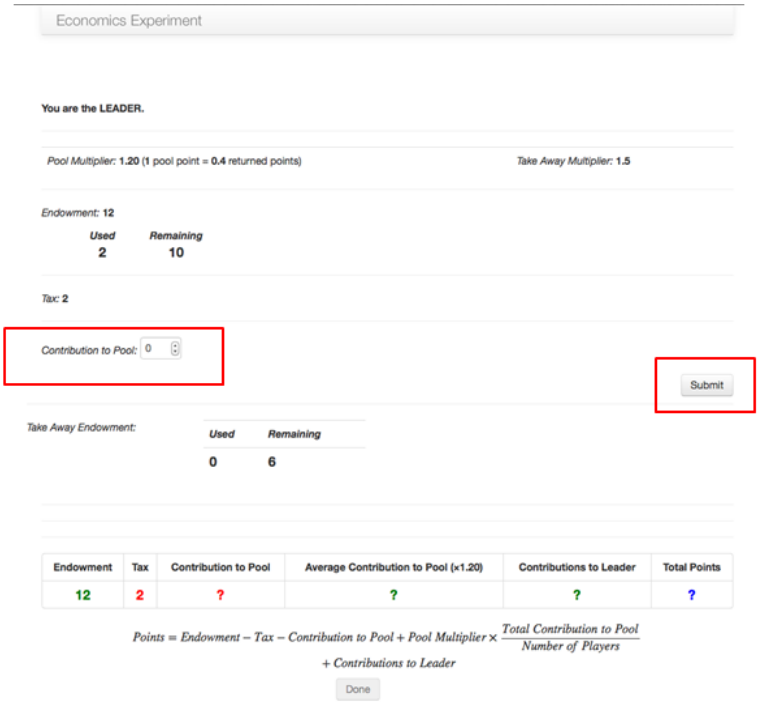


If you are the leader for a period, you will be identified at the top of the screen. Note that all group members, including the leader are anonymous to other group members. Your screen looks very similar to other group members, with a few differences.

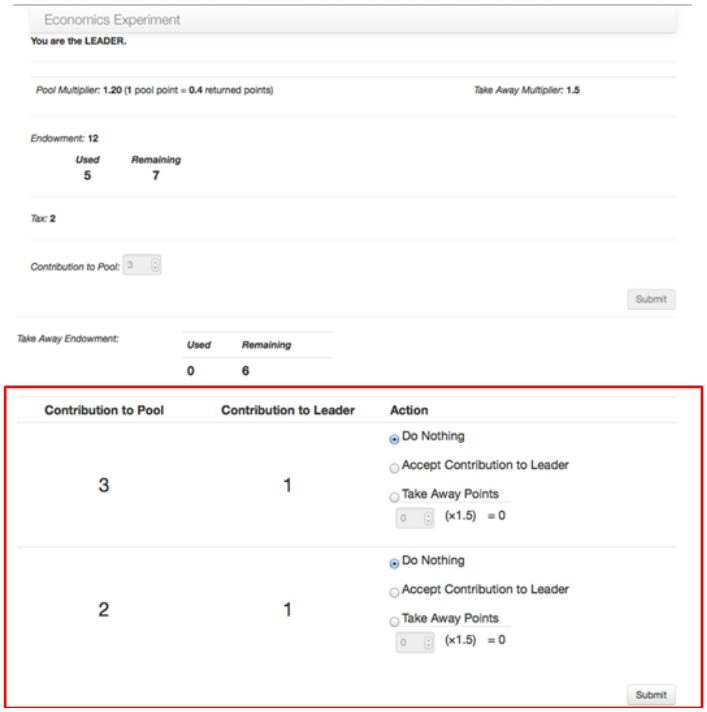


Like other group members you pay a tax and choose how much you wish to allocate to the group pool and how much to keep for yourself, but, unlike other group members you do not contribute to the leader, since you are the leader and you would be contributing to yourself.

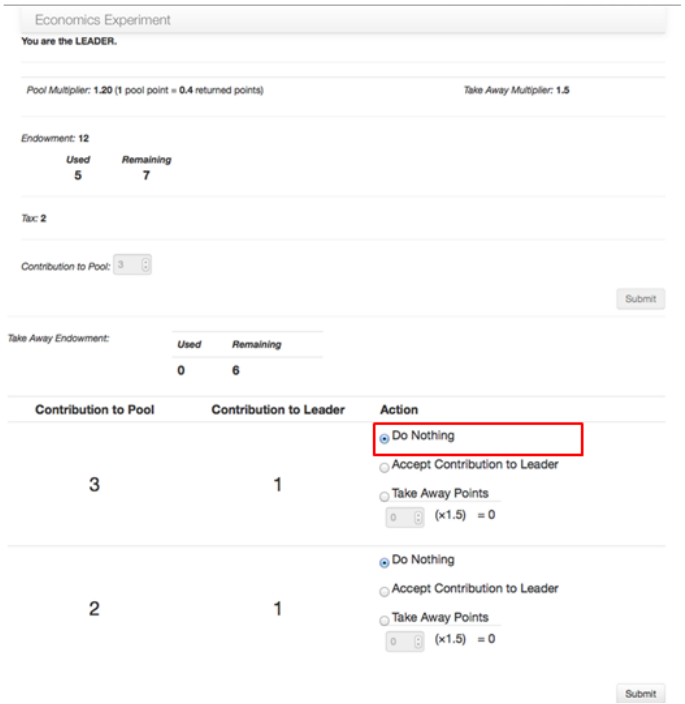
You also have access to tax points that you may use for taking away points from group members based on the Take Away multiplier.



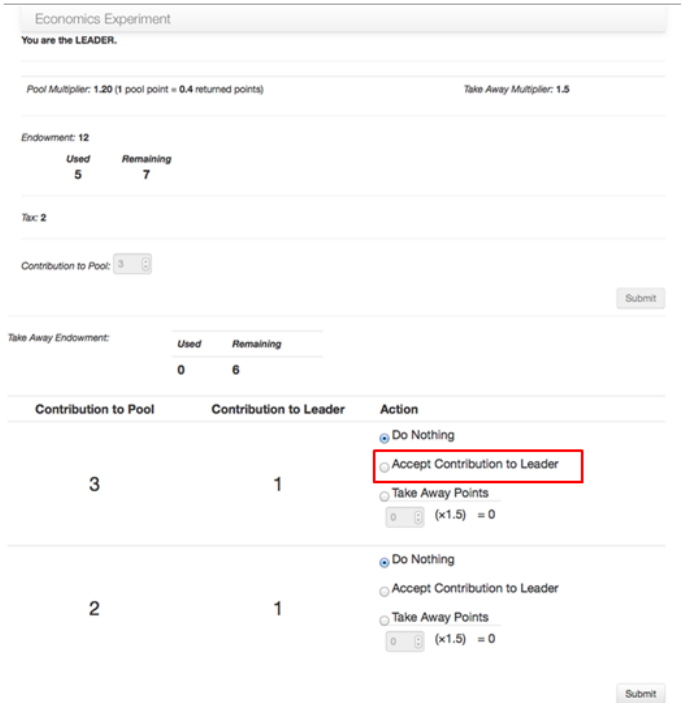
When you have made your decision about how many points to allocate to the group pool, click "Submit". After clicking "Submit", you will not be able to change your decision.



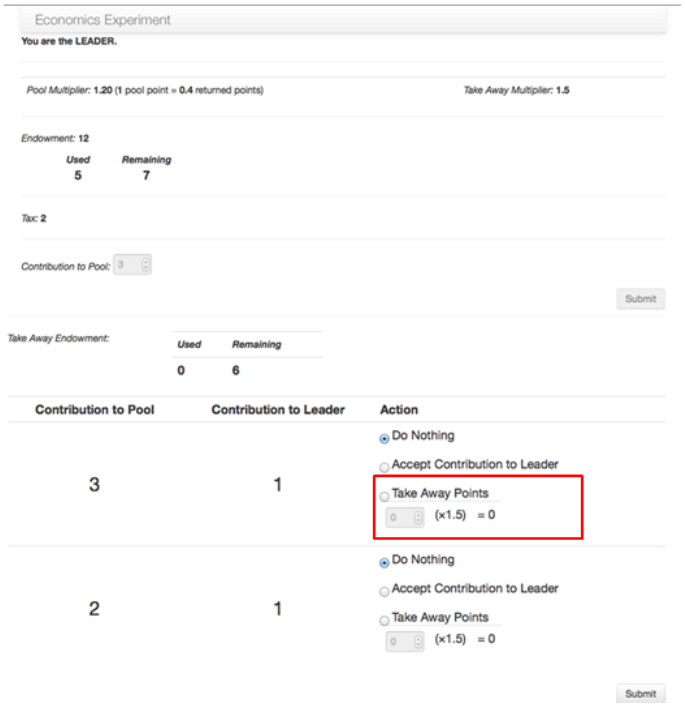
The actions of group members will appear below this after they make their decision. The Contribution column are the contributions to the group pool and the Payment column shows points given to you, the Leader.



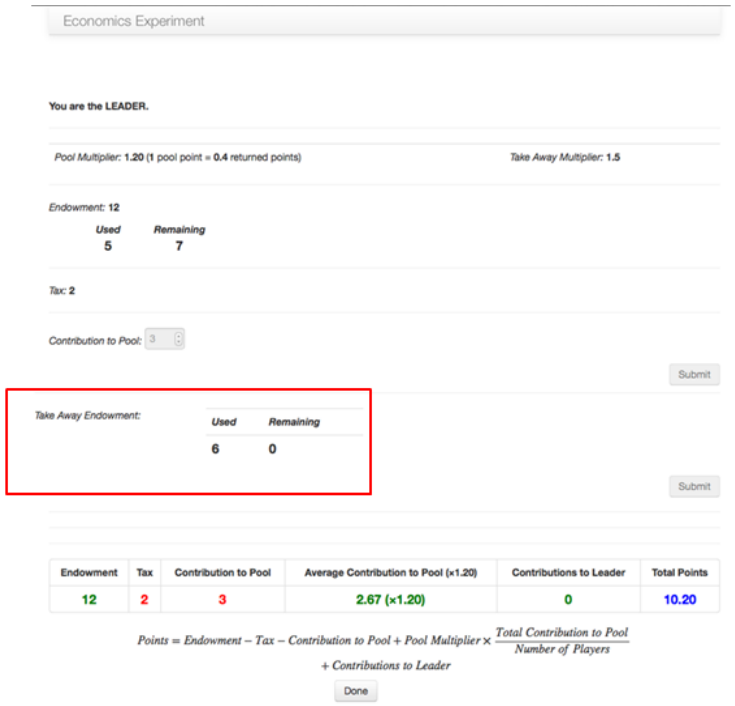
You may do nothing…



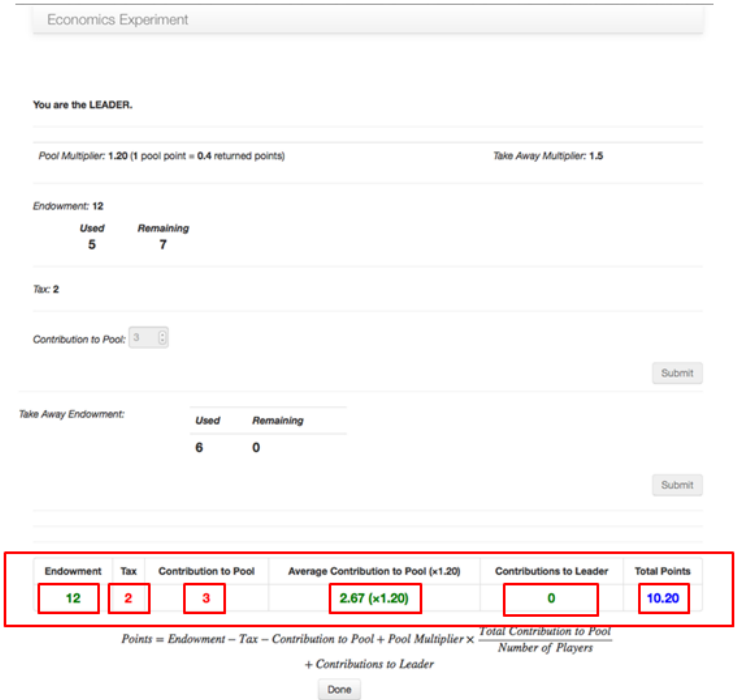
accept these points…



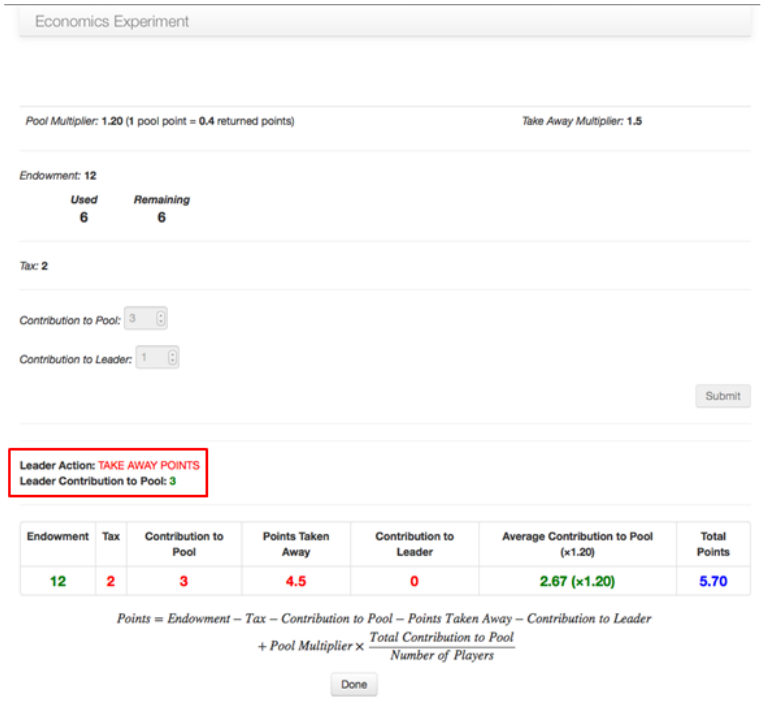
or take points away from any group member. If you take away points, you decide how much to take by allocating tax points to the group member. The total points taken away is calculated for you next to this box.



Any tax points not used for taking away points from group members will be returned to the experimenter. Similarly any points taken away from group members will also be returned to the experimenter.



As a leader your earnings for this period will be calculated from your initial endowment minus your taxes, minus your contribution, plus the average contribution to the pool – 2.67, multiplied by the pool multiplier, plus any points you accepted, giving you a total of 10.2 for this period.

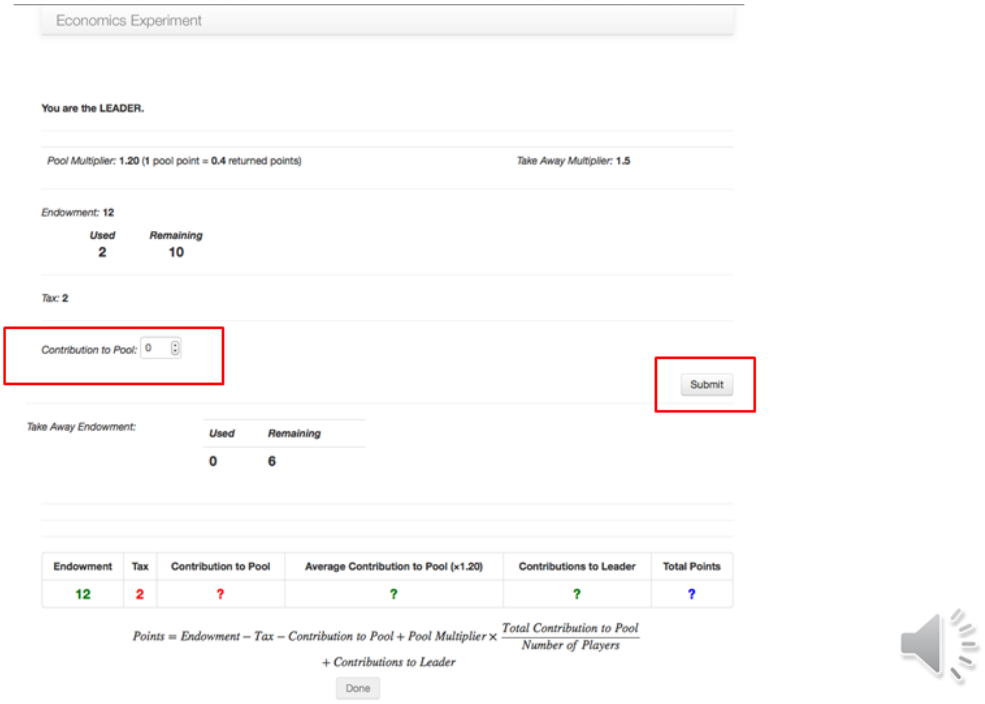


After the leader clicks submit, group members will be informed of the leader's action and the leader's contribution to the pool. The earnings of group members for this period will be calculated from their initial endowment minus their taxes, minus their contribution. Then either minus the points taken away by the leader OR minus the points given to the leader. Any points given to the leader and not accepted will be returned to the group member. In the example here, the leader chose to take points away from the group member. Finally, the group members share of the group pool will be added to this amount to calculate the total points for this period. Here the average contribution is shown – 2.67 points. This is multiplied by the pool multiplier and then added to give total points – 5.7 for this group member.

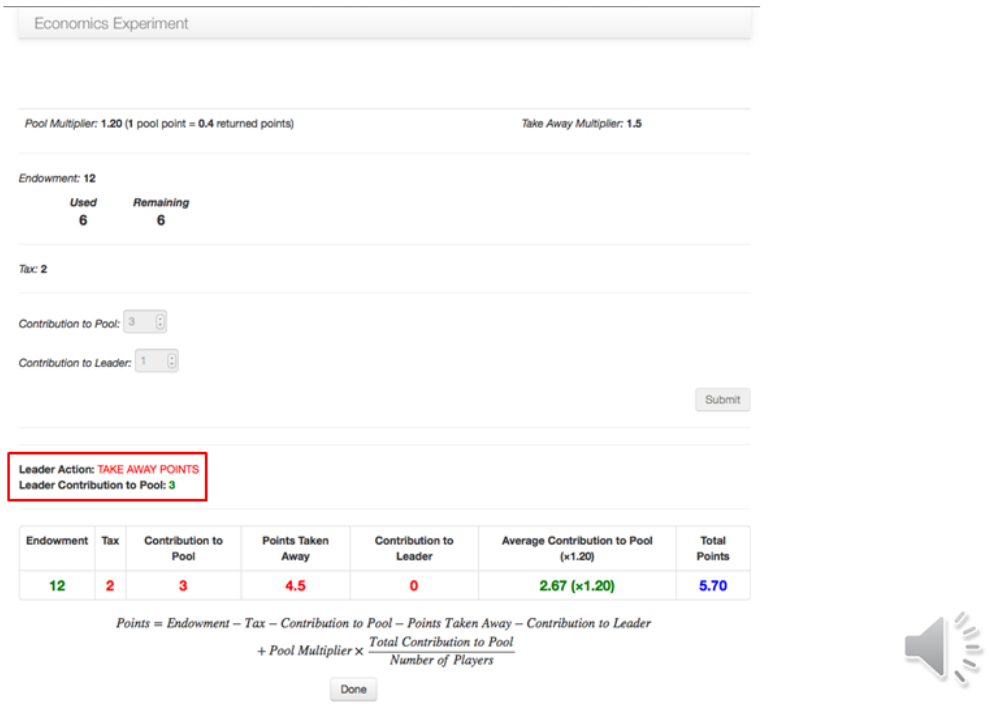
Please click "Done" at the bottom of the screen to move to the next period.

Please click "Continue" when you are ready to begin.

Subsequent Round



The difference between this round and previous rounds is that in this round, like other group members, the leader must choose how much to contribute to the group pool. They may also accept points from group members.



In addition, group members not only see the leader's action towards them, but also the leader's

contribution to the group pool. They do not see the leader's actions towards other group members. As in all rounds, all participants are completely anonymous.

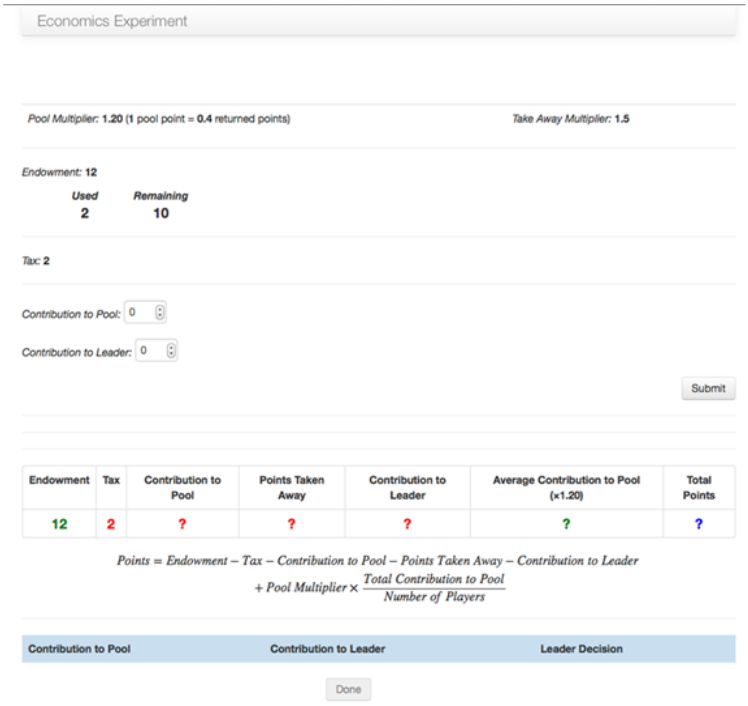
Please click "Continue" when you are ready to begin.

Quiz Questions

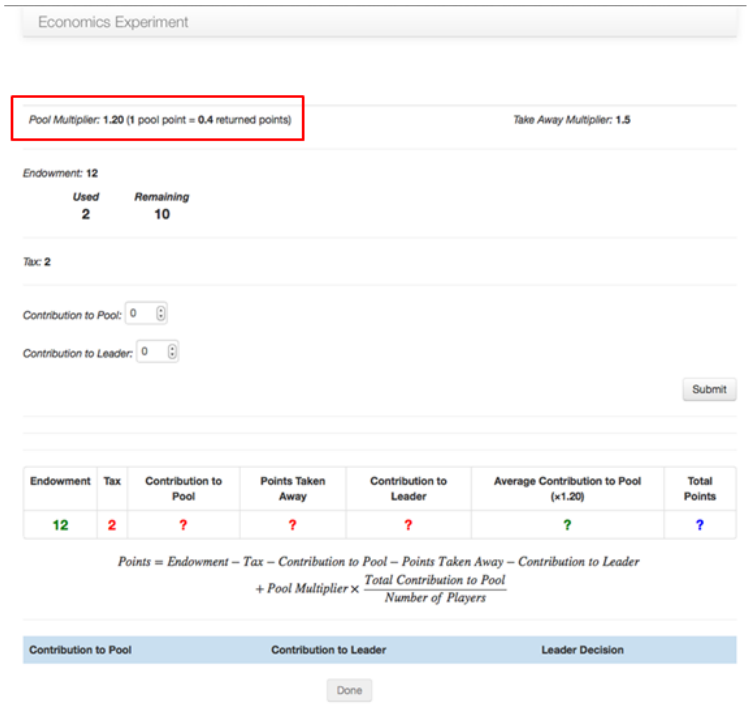
1. How many periods will you play?
    a. 10 periods
    b. More than 10 periods
    c. Less than 10 periods
    d. An average of 10 periods, but possibly more and possibly less
2. If everyone contributes the same amount to the group pool, will you:
    a. Increase your points from your initial endowment
    b. Decrease your points from your initial endowment
    c. Have the same points as your initial endowment
    d. Might increase your points or might decrease your points
3. How much does the leader contribute to the group pool?
    a. However much they choose to allocate to the group pool
    b. 10 points
    c. Depends on the points given to the leader
    d. Depends on the group member's contributions
4. Which of the following can the leader NOT do?
    a. Nothing
    b. Accept points from a group member
    c. Take points away from a group member
    d. Accept points and take points away from the same group member
5. If a leader does not accept points where do these points go?
    a. Goes to the leader anyway
    b. Goes back to the group member
    c. Goes to the experimenter
    d. Is added to the group pool
6. What actions of other group members can group members see?
    a. Leader's action towards them
    b. Leader's contribution
    c. Leader's contribution and all actions
    d. All group member and leader actions

Bribery Game with Full Transparency

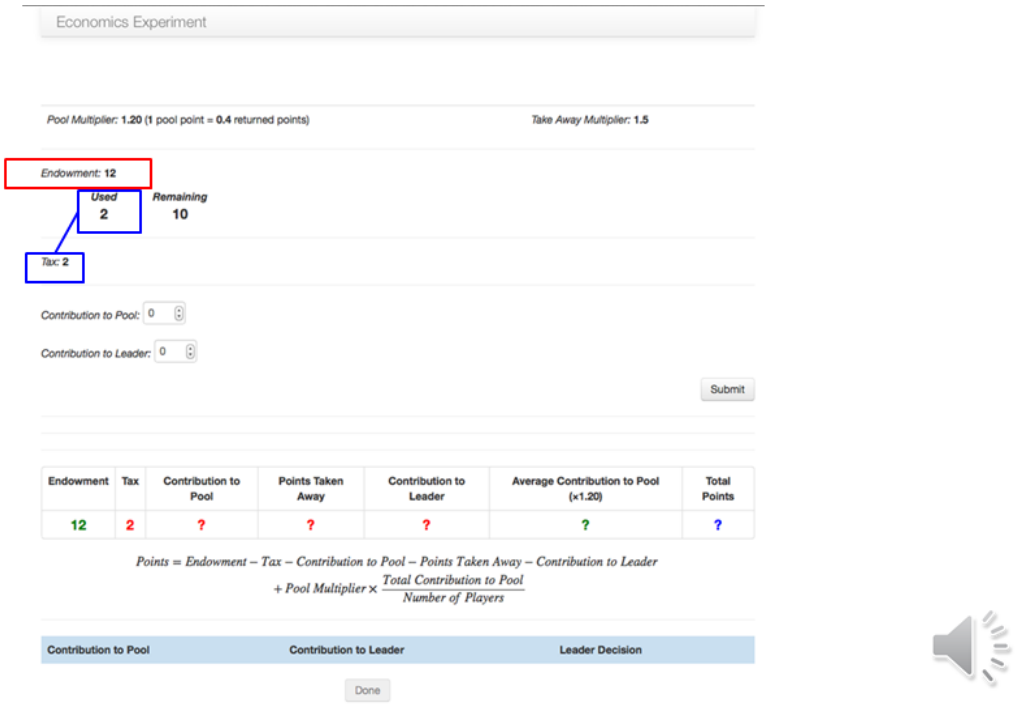
First Round



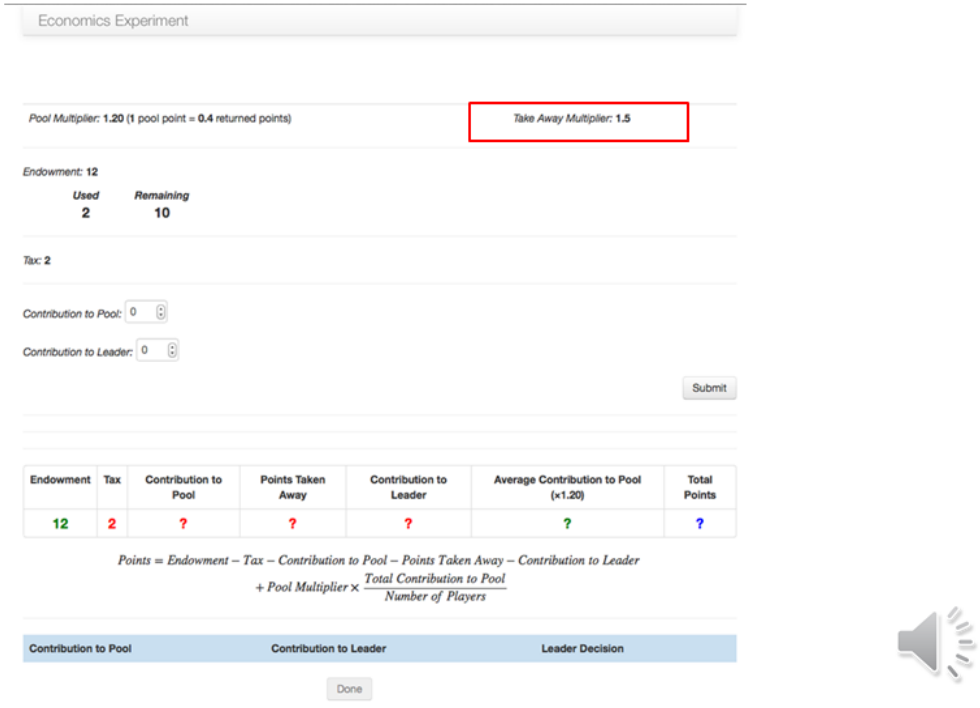
Welcome to the first round. The screen you see in front of you is the normal screen for play. In each period, one person from the group will be selected at random to play the role of a leader. The leader will have a slightly different screen. Please pay attention to all screens presented in these instructions as the instructions for other other rounds will only highlight the differences between that round and this one.



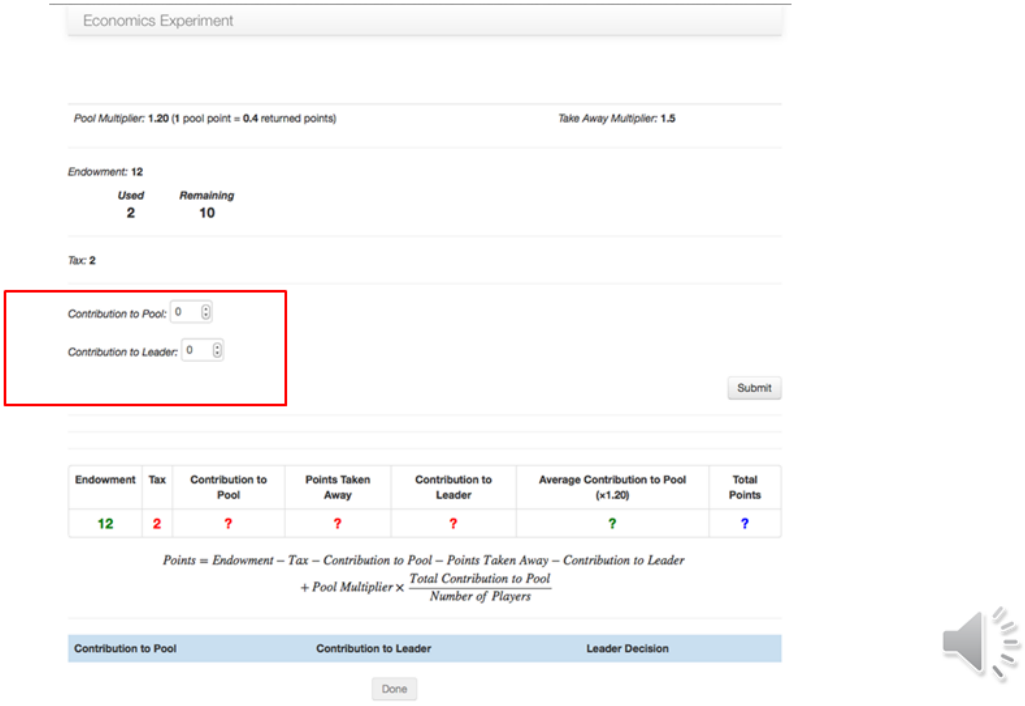
The first thing we'd like to draw your attention to is the pool multiplier. When group members allocate points to the group pool, the total allocated by the group is multipled by this number, the pool multiplier. In this case, it's 1.2. The new total is then distributed equally among everyone in the group, including the leader. This means that if every group member allocated all their points, all group members would increase their earnings by 20%. If no one allocates to the group pool, there's nothing to multiply by 1.2, and nothing to divide up. Another way to think about this is to consider how much each point in the pool is worth to each player. This is shown within parantheses to the right of the pool multiplier. In this case, with 3 players, each player gets 0.4 points for every point in the pool, no matter who contributes it. For example, if each player contributed 1 point pool, there would be 3 points in the pool and each player would get back 3 times 0.4 or 1.2 points.



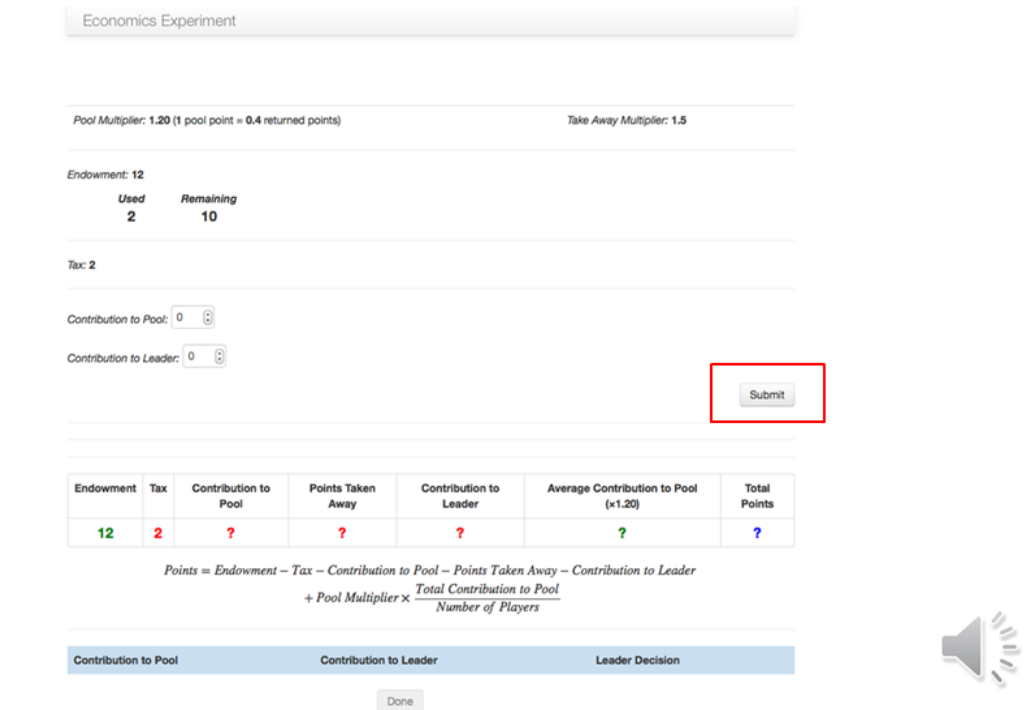
Below this, we see your initial endowment of 12 points. 2 points are taxed each period, which can be used by the leader to take points away from group members. This leaves you 10 points to allocate.



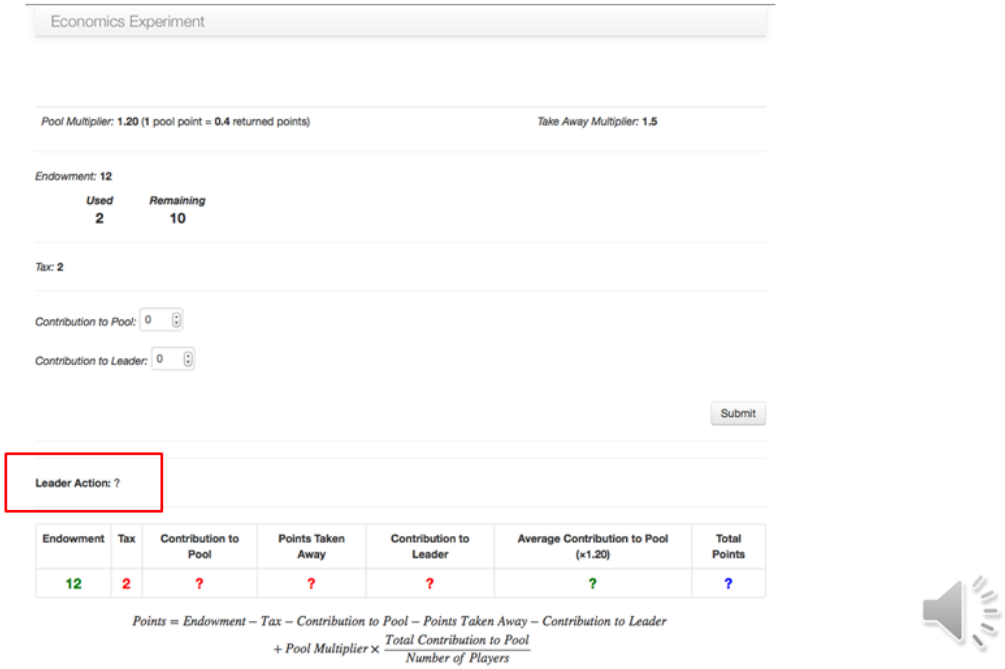
Here you see the Take Away multiplier. This is how much each tax point is multiplied by when the leader takes points away from a group member. For example, here, if the leader spent 1 tax point to take points away, 1.5 points would be taken from the targeted group member.



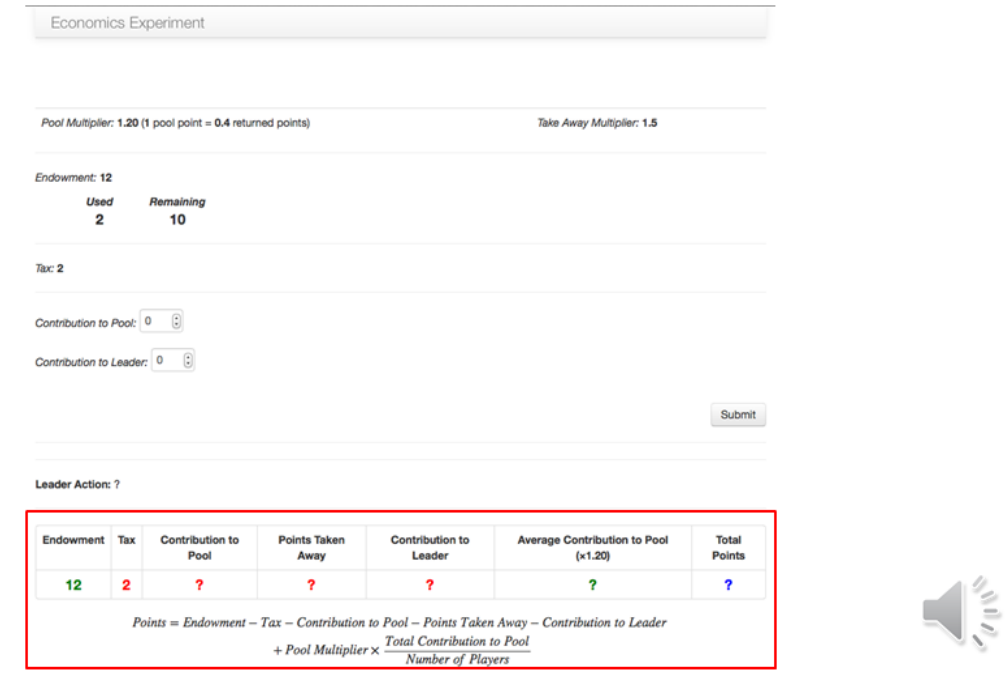
Here we see the boxes that are used to allocate your remaining 10 points to either the group pool or to the leader. Any points you do not allocate will be kept for yourself. When you hover your mouse over these boxes you will see an arrow to increase or decrease the amount in 1 point intervals or you may type in a value.



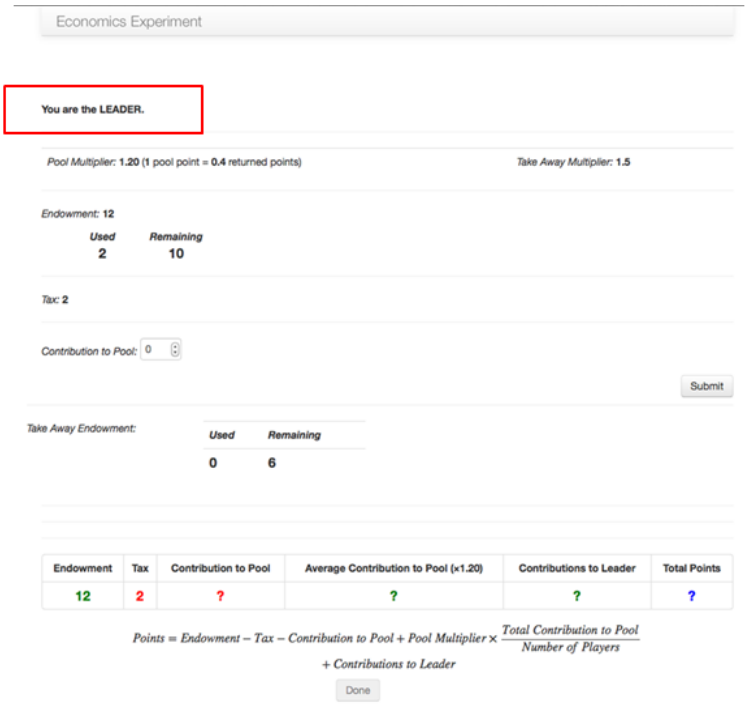
When you have made your decision, click "Submit". After clicking "Submit", you will not be able to change your decision.



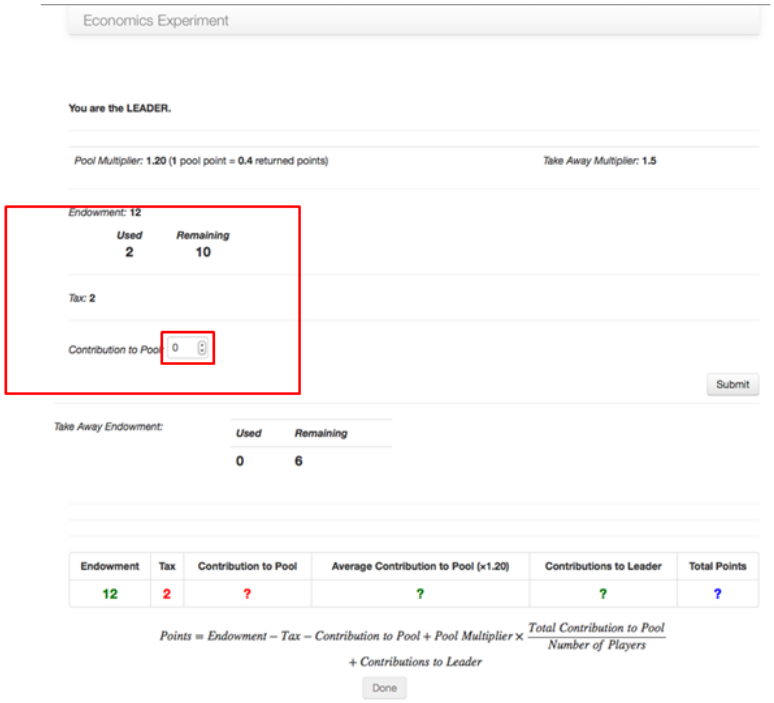
This section will show you the leader's action. The leader has 3 choices – to take points from you, accept your points, or do nothing. They may only choose one of these options.



Here you see how your points for this period are calculated. Everything in green is added, everything in red is subtracted, and your total points for the period is shown in blue on the right. We will return to this after explaining the leader's screen.

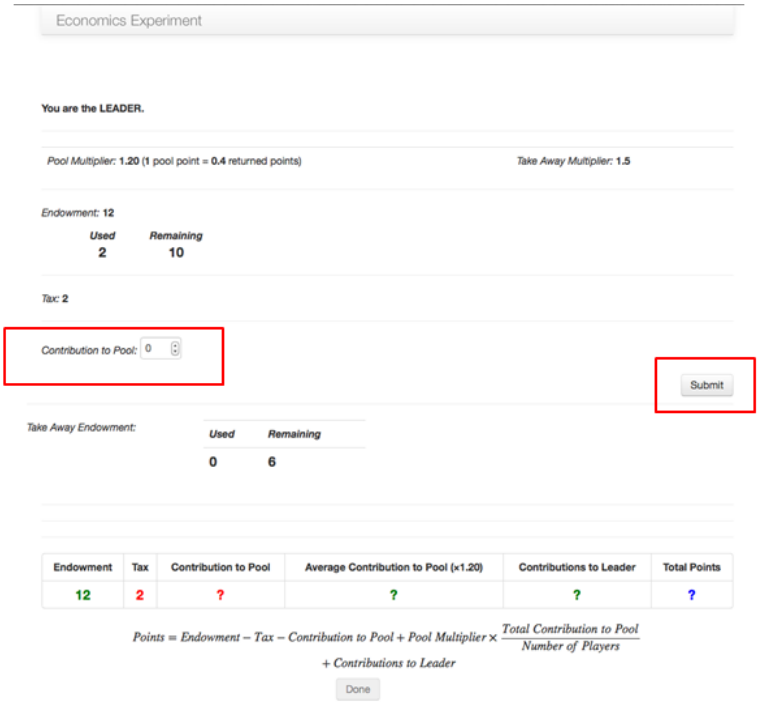


If you are the leader for a period, you will be identified at the top of the screen. Note that all group members, including the leader are anonymous to other group members. Your screen looks very similar to other group members, with a few differences.

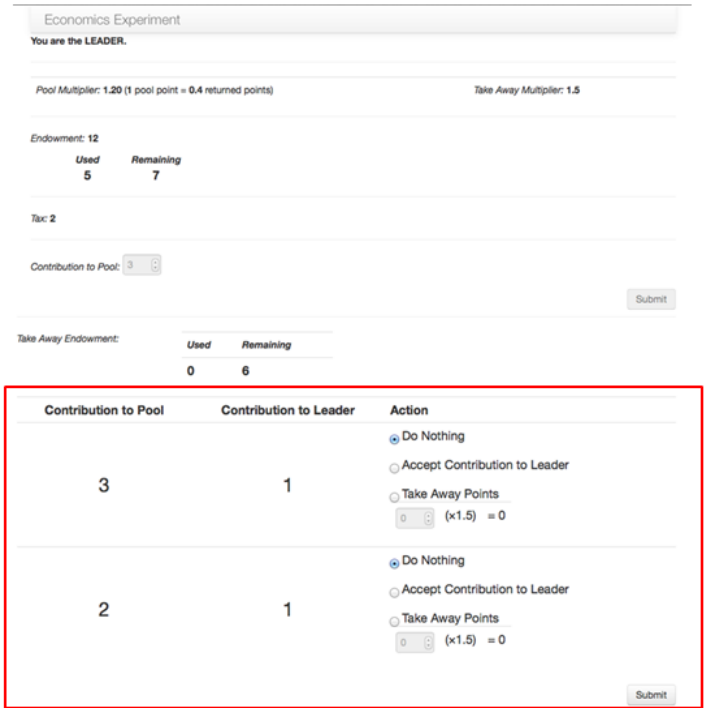


Like other group members you pay a tax and choose how much you wish to allocate to the group pool and how much to keep for yourself, but, unlike other group members you do not contribute to the leader, since you are the leader and you would be contributing to yourself.

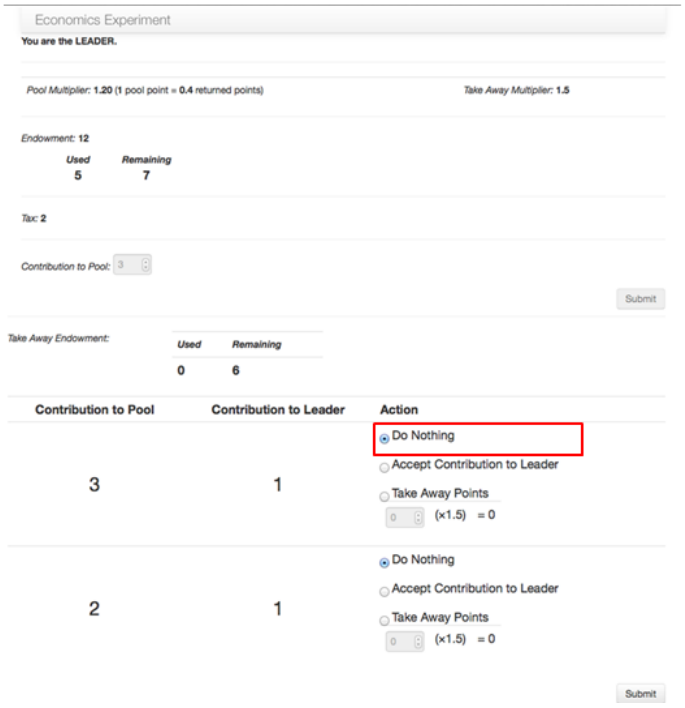
You also have access to tax points that you may use for taking away points from group members based on the Take Away multiplier.



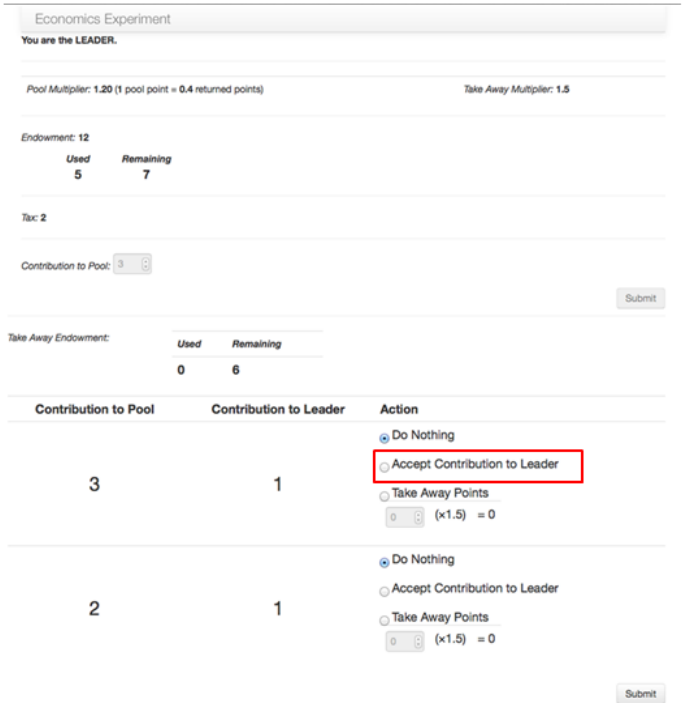
When you have made your decision about how many points to allocate to the group pool, click "Submit". After clicking "Submit", you will not be able to change your decision.



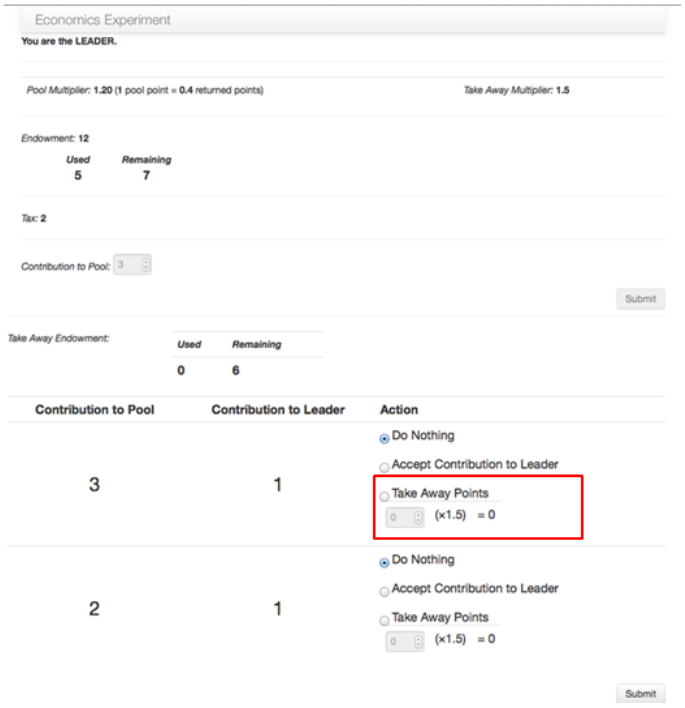
The actions of group members will appear below this after they make their decision. The Contribution column are the contributions to the group pool and the Payment column shows points given to you, the Leader.



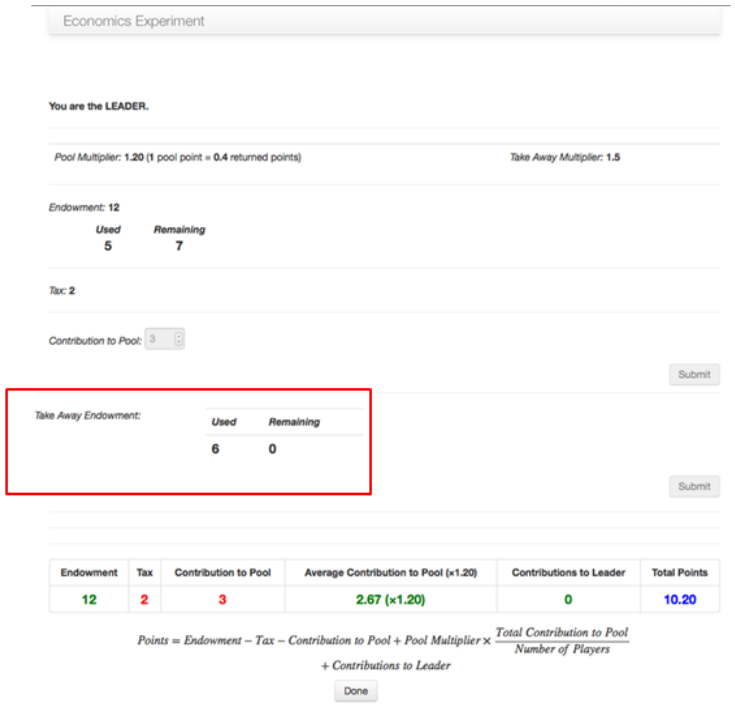
You may do nothing…



accept these points…



or take points away from any group member. If you take away points, you decide how much to take by allocating tax points to the group member. The total points taken away is calculated for you next to this box.



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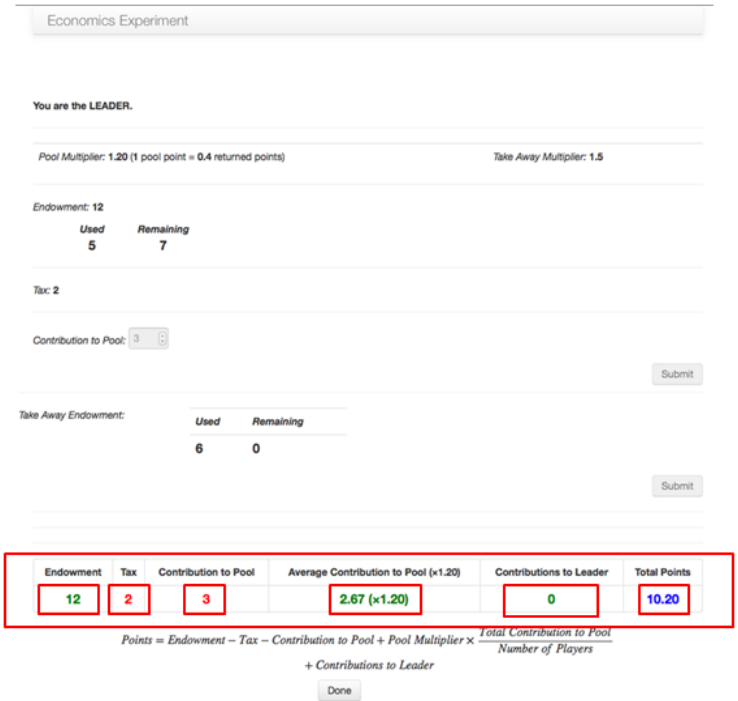
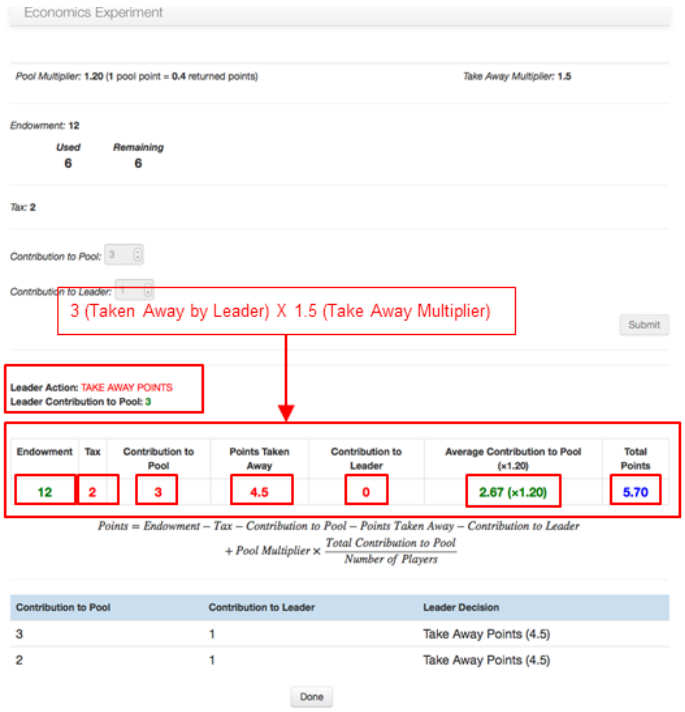
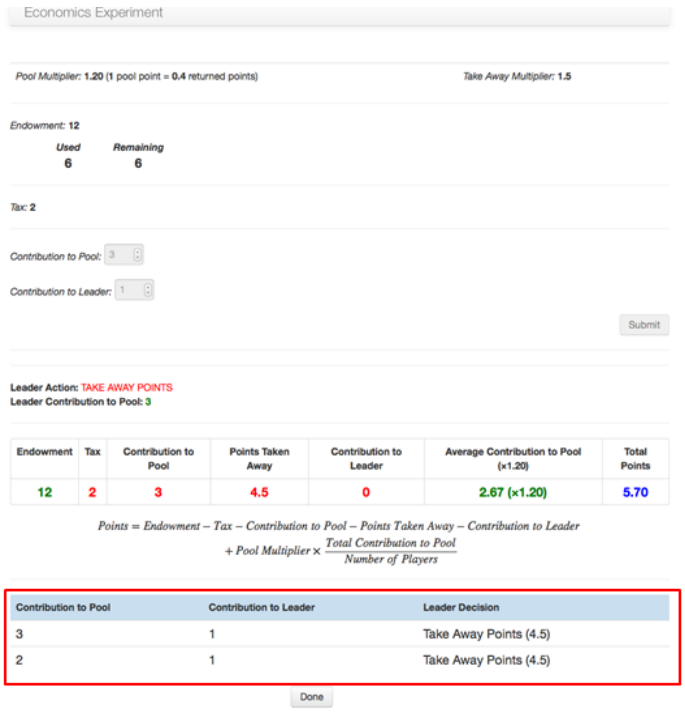


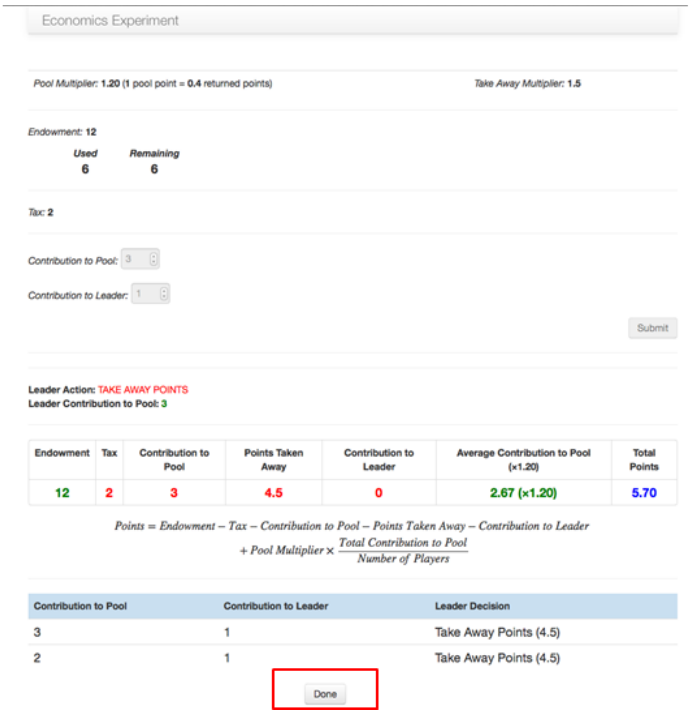
As a leader your earnings for this period will be calculated from your initial endowment minus your taxes, minus your contribution, plus the average contribution to the pool – 2.67, multiplied by the pool multiplier, plus any points you accepted, giving you a total of 10.2 for this period.



After the leader clicks submit, group members will be informed of the leader's action and the leader's contribution to the pool. The earnings of group members for this period will be calculated from their initial endowment minus their taxes, minus their contribution. Then either minus the points taken away by the leader OR minus the points given to the leader. Any points given to the leader and not accepted will be returned to the group member. In the example here, the leader chose to take points away from the group member. Finally, the group members share of the group pool will be added to this amount to calculate the total points for this period. Here the average contribution is shown – 2.67 points. This is multiplied by the pool multiplier and then added to give total points – 5.7 for this group member.



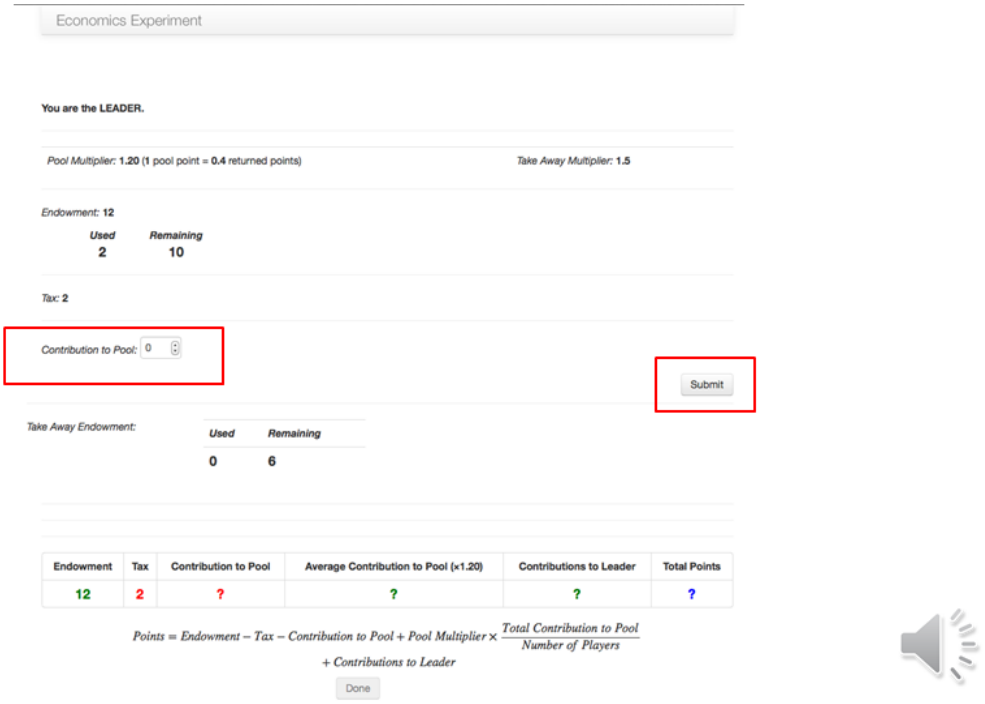
Group members will also be informed of the leader's decision for each decision made by other group members. Each line shows a group member's contribution to the pool, contribution to the leader and the leader's action. Group members themselves remain anonymous.



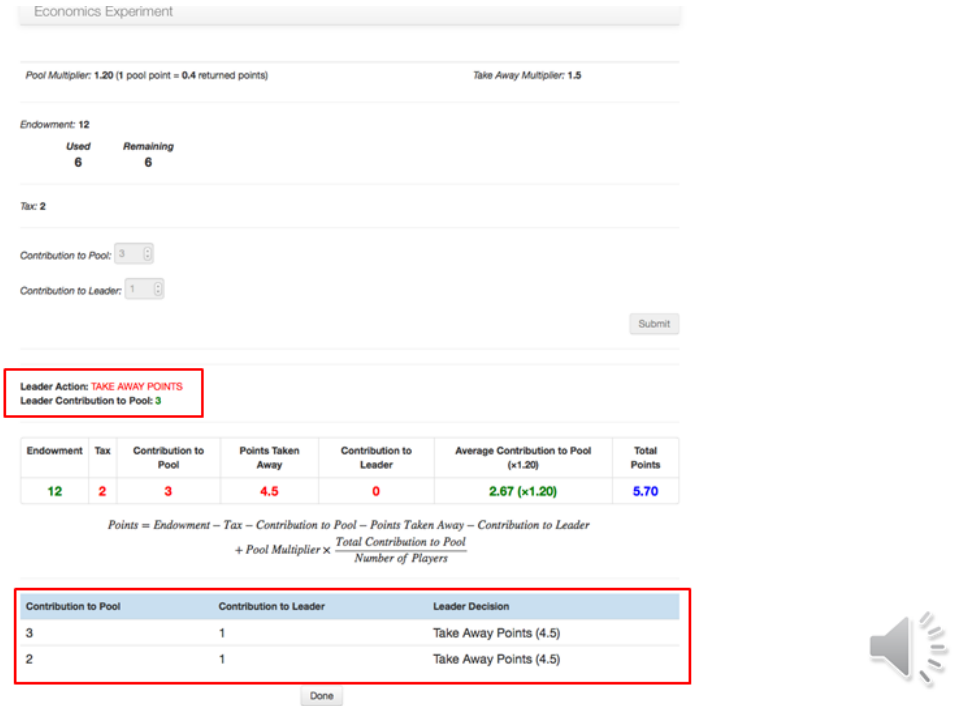
Please click "Done" at the bottom of the screen to move to the next period.

Please click "Continue" when you are ready to begin.

Subsequent Round



The difference between this round and previous rounds is that in this round, like other group members, the leader must choose how much to contribute to the group pool. They may also accept points from group members.



In addition, group members not only see the leader's action towards them, but also the leader's

contribution to the group pool and the leader's actions towards other group members, including what the other group members contributed to the group pool and to the leader. As in all rounds, all participants are completely anonymous.

Please click "Continue" when you are ready to begin.

Quiz Questions

1. How many periods will you play?
    a. 10 periods
    b. More than 10 periods
    c. Less than 10 periods
    d. An average of 10 periods, but possibly more and possibly less
2. If everyone contributes the same amount to the group pool, will you:
    a. Increase your points from your initial endowment
    b. Decrease your points from your initial endowment
    c. Have the same points as your initial endowment
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3. How much does the leader contribute to the group pool?
    a. However much they choose to allocate to the group pool
    b. 10 points
    c. Depends on the points given to the leader
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4. Which of the following can the leader NOT do?
    a. Nothing
    b. Accept points from a group member
    c. Take points away from a group member
    d. Accept points and take points away from the same group member
5. If a leader does not accept points where do these points go?
    a. Goes to the leader anyway
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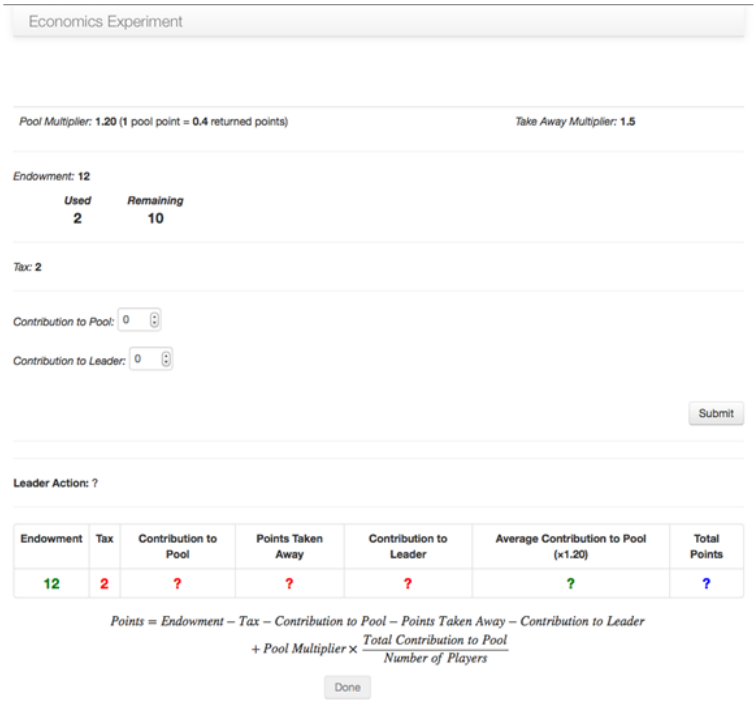
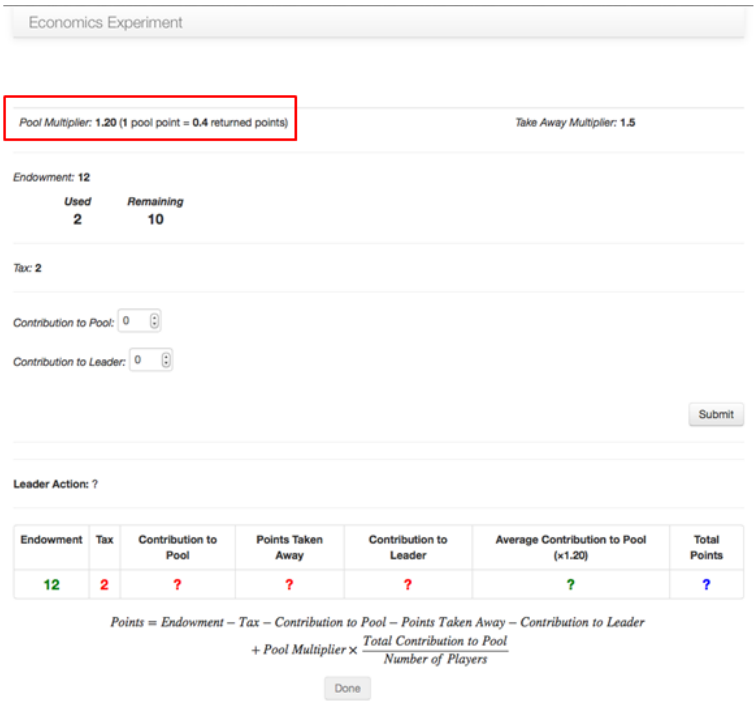
    c. Goes to the experimenter
    d. Is added to the group pool
6. What actions of other group members can group members see?
    a. Leader's action towards them
    b. Leader's contribution
    c. Leader's contribution and all actions
    d. All group member and leader actions

Bribery Game with Leader Investment

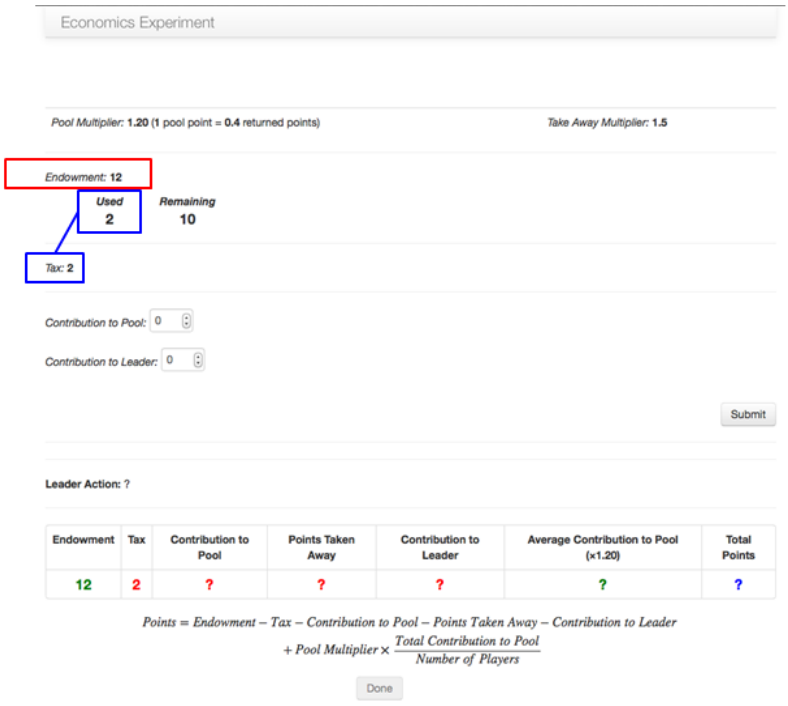
First Round



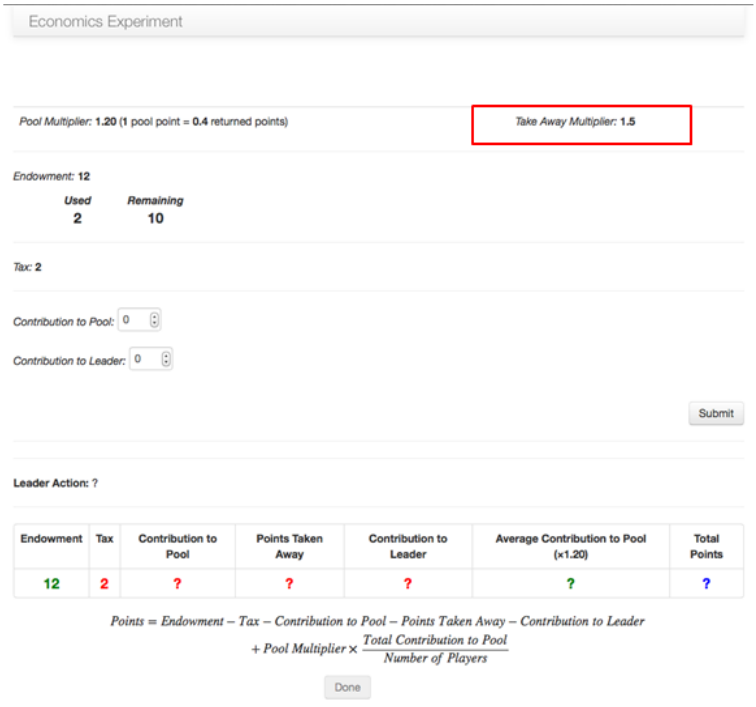
Welcome to the first round. The screen you see in front of you is the normal screen for play. In each period, one person from the group will be selected at random to play the role of a leader. The leader will have a slightly different screen. Please pay attention to all screens presented in these instructions as the instructions for other other rounds will only highlight the differences between that round and this one.



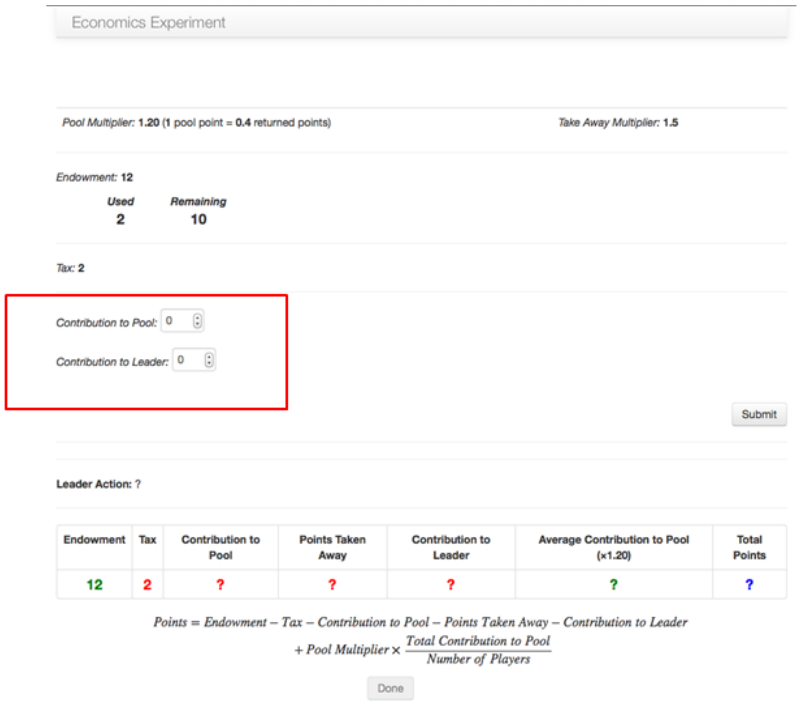
The first thing we'd like to draw your attention to is the pool multiplier. When group members allocate points to the group pool, the total allocated by the group is multipled by this number, the pool multiplier. In this case, it's 1.2. The new total is then distributed equally among everyone in the group, including the leader. This means that if every group member allocated all their points, all group members would increase their earnings by 20%. If no one allocates to the group pool, there's nothing to multiply by 1.2, and nothing to divide up. Another way to think about this is to consider how much each point in the pool is worth to each player. This is shown within parantheses to the right of the pool multiplier. In this case, with 3 players, each player gets 0.4 points for every point in the pool, no matter who contributes it. For example, if each player contributed 1 point pool, there would be 3 points in the pool and each player would get back 3 times 0.4 or 1.2 points.



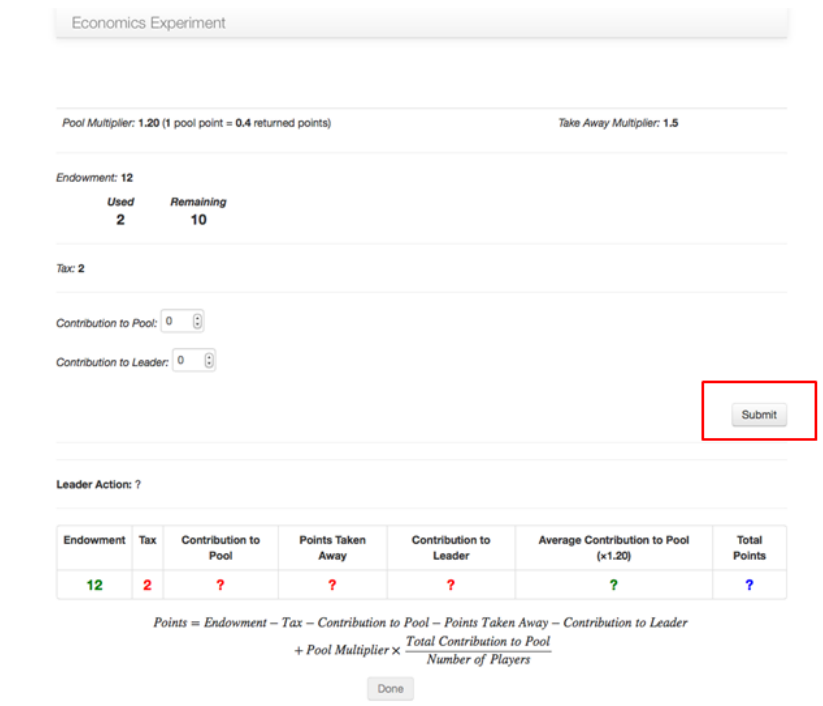
Below this, we see your initial endowment of 12 points. 2 points are taxed each period, which can be used by the leader to take points away from group members. This leaves you 10 points to allocate.



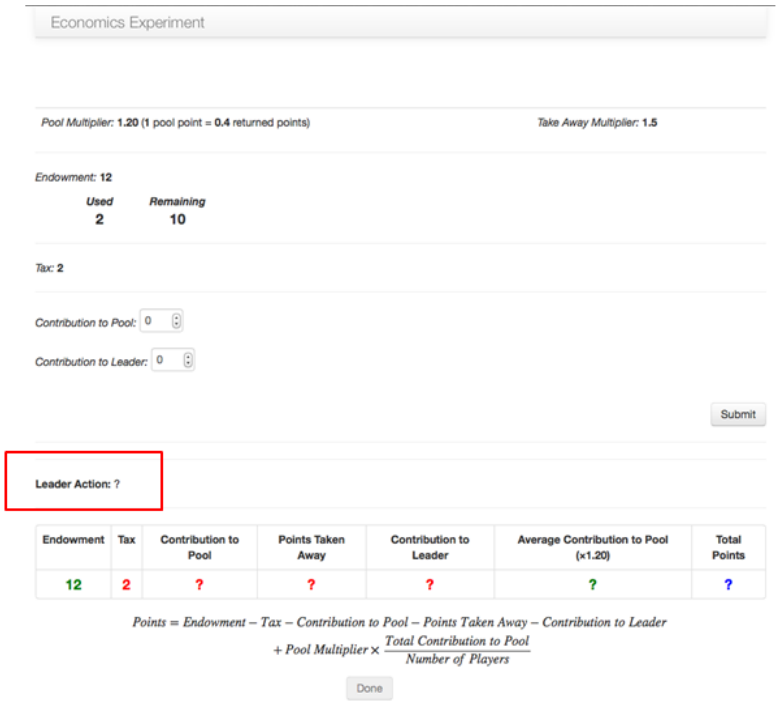
Here you see the Take Away multiplier. This is how much each tax point is multiplied by when the leader takes points away from a group member. For example, here, if the leader spent 1 tax point to take points away, 1.5 points would be taken from the targeted group member.



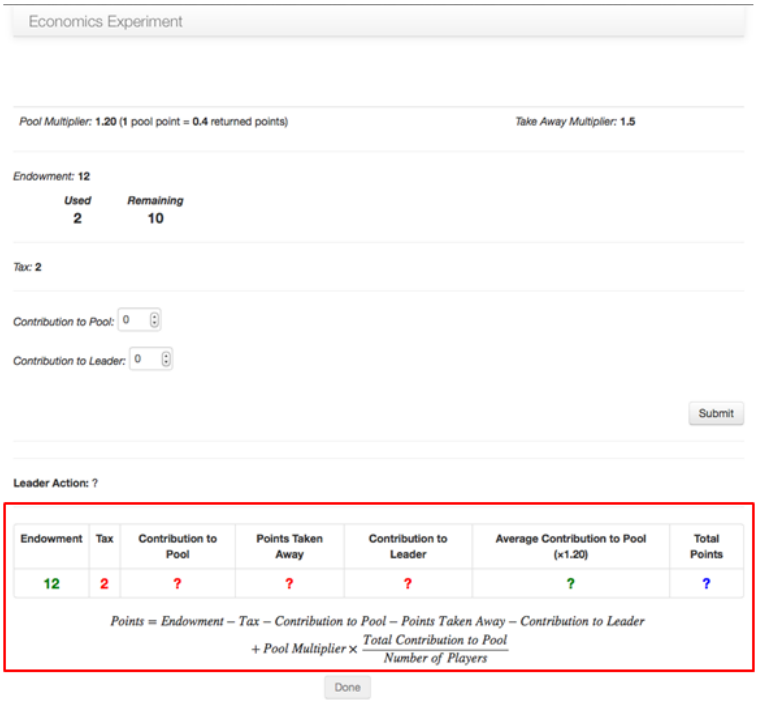
Here we see the boxes that are used to allocate your remaining 10 points to either the group pool or to the leader. Any points you do not allocate will be kept for yourself. When you hover your mouse over these boxes you will see an arrow to increase or decrease the amount in 1 point intervals or you may type in a value.



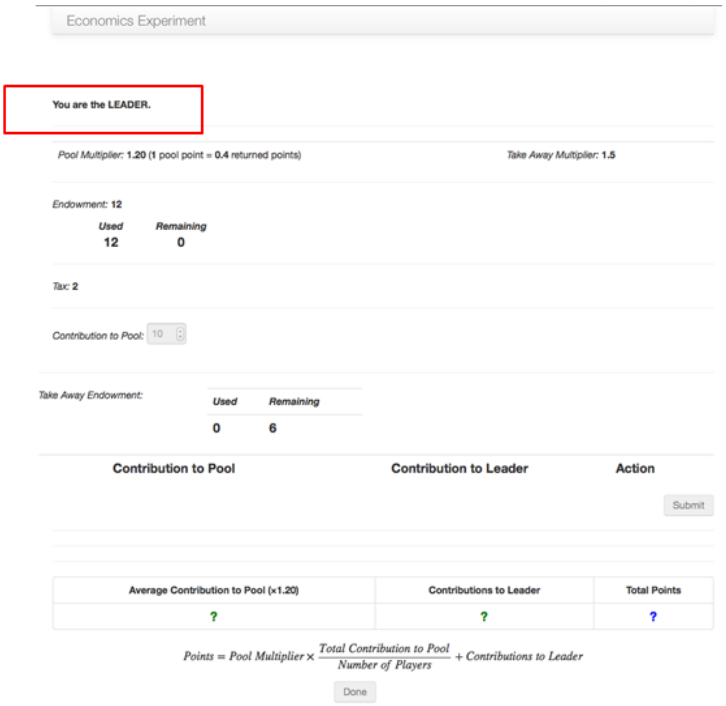
When you have made your decision, click "Submit". After clicking "Submit", you will not be able to change your decision.



This section will show you the leader's action. The leader has 3 choices – to take points from you, accept your points, or do nothing. They may only choose one of these options.



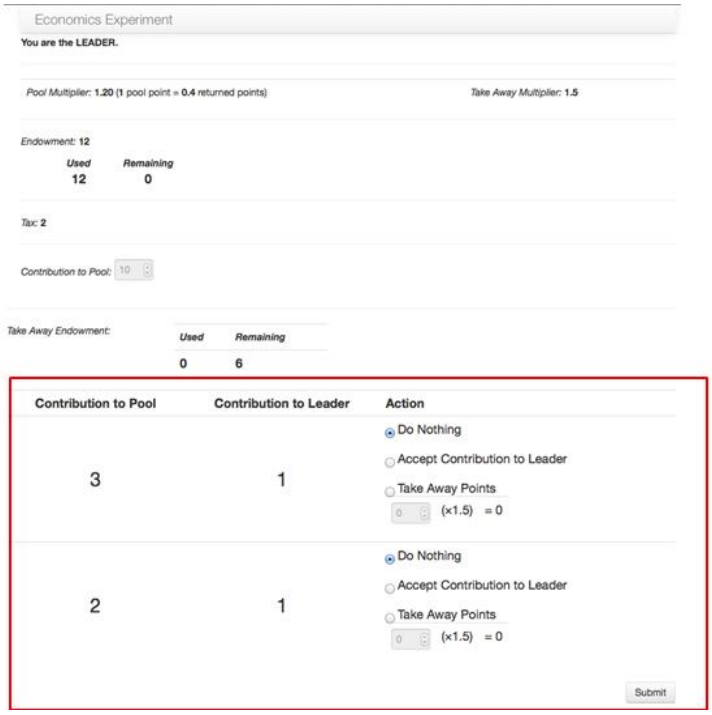
Here you see how your points for this period are calculated. Everything in green is added, everything in red is subtracted, and your total points for the period is shown in blue on the right. We will return to this after explaining the leader's screen.



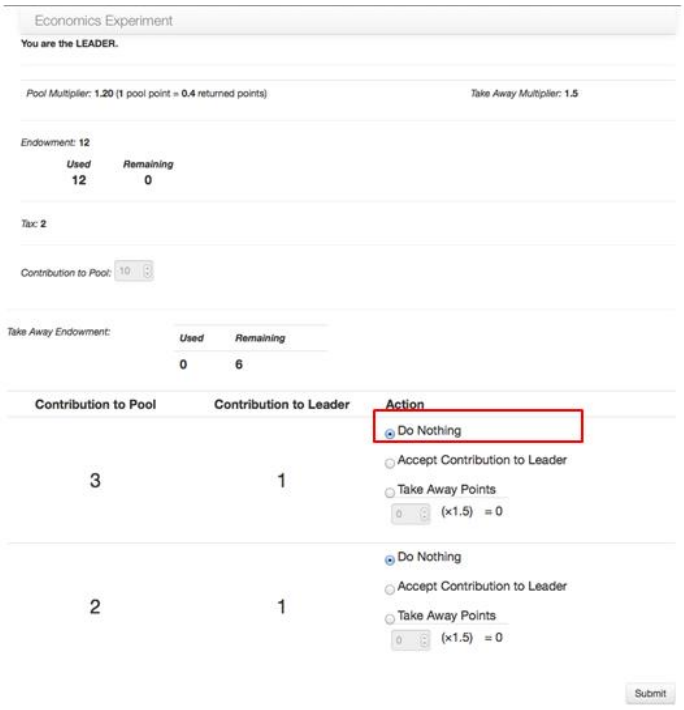
If you are the leader for a period, you will be identified at the top of the screen. Note that all group members, including the leader are anonymous to other group members. Your screen looks very similar to other group members, with a few differences.

Like other group members you pay a tax; but, unlike other group members you automatically contribute the maximum amount to the group pool.

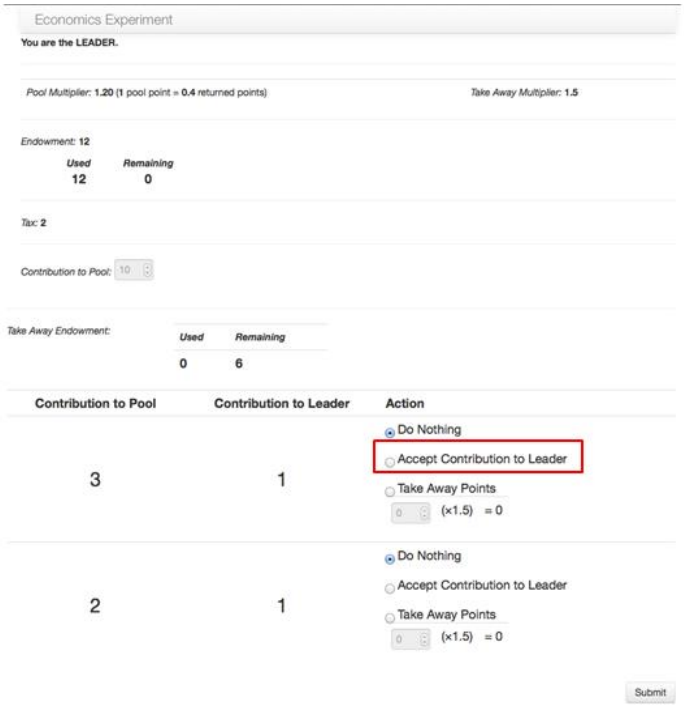
You also have access to tax points that you may use for taking away points from group members based on the Take Away multiplier.



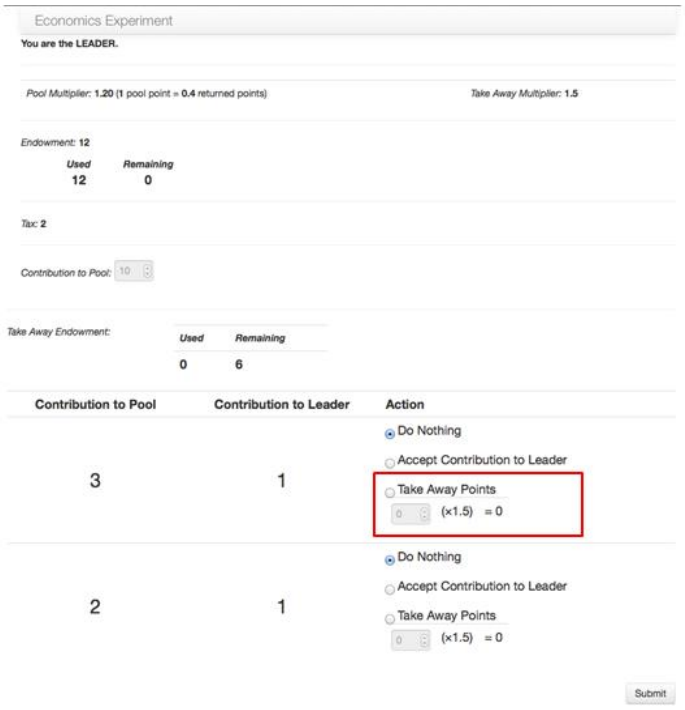
The actions of group members will appear below this after they make their decision. The Contribution column are the contributions to the group pool and the Payment column shows points given to you, the Leader.



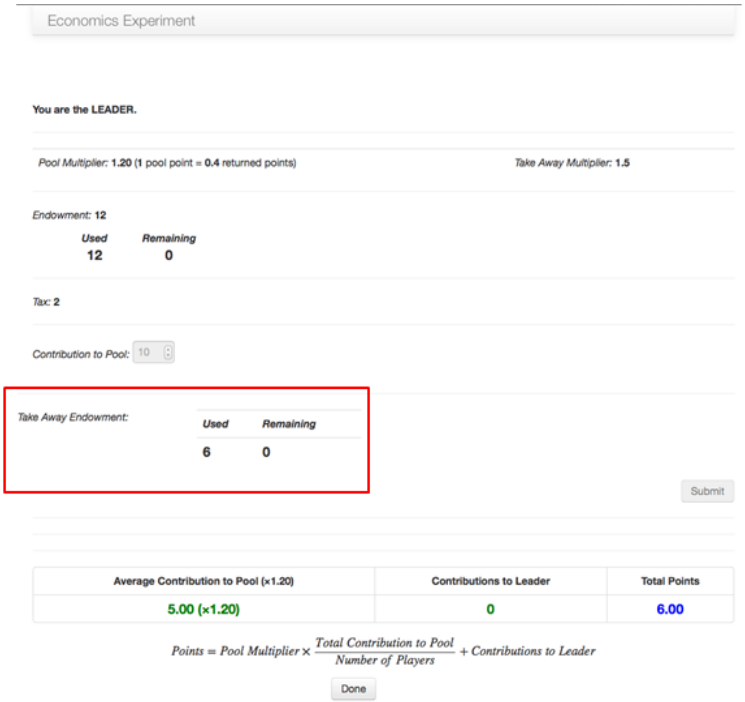
You may do nothing…



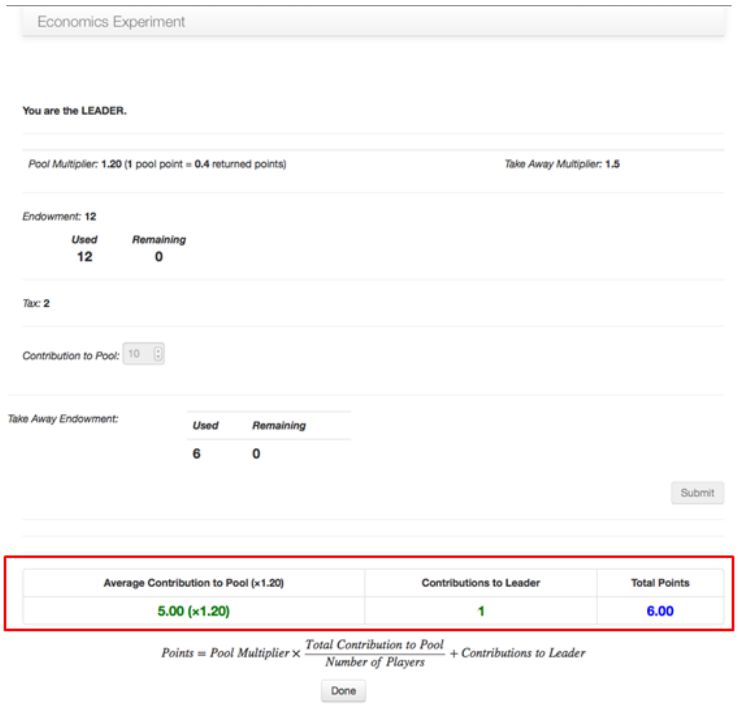
accept these points…



or take points away from any group member. If you take away points, you decide how much to take by allocating tax points to the group member. The total points taken away is calculated for you next to this box.

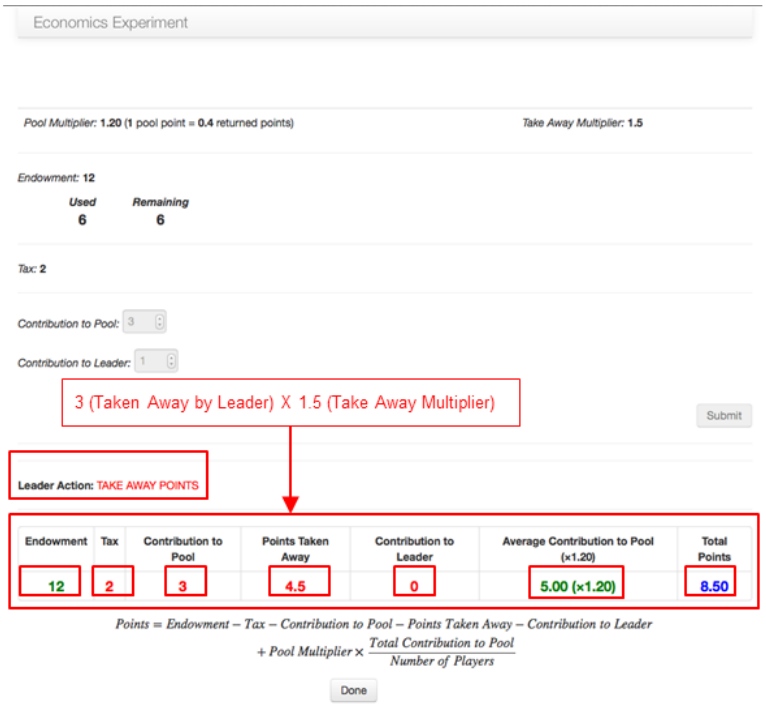


Any tax points not used for taking away points from group members will be returned to the experimenter. Similarly any points taken away from group members will also be returned to the experimenter.



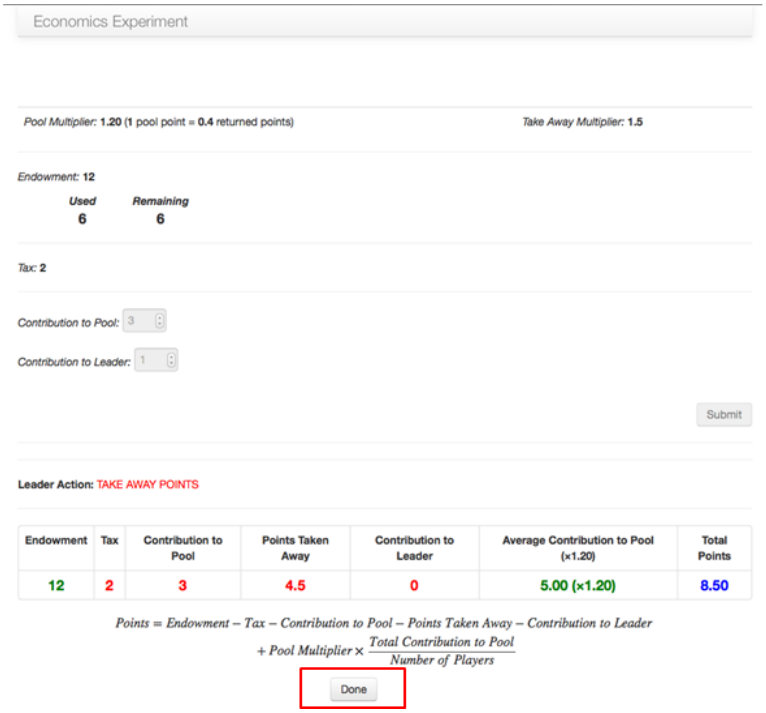
As a leader your earnings for this period are determined by how much you receive from your share of the group pool and the points you accept from each group member.

The average contribution of group members is shown here – 5 points. This is multiplied by the pool multiplier then added to accepted points to give the total points for this period – 6.



After the leader clicks submit, group members will be informed of the leader's action. The earnings of group members for this period will be calculated from their initial endowment minus their taxes,

minus their contribution. Then either minus the points taken away by the leader OR minus the points given to the leader. Any points given to the leader and not accepted will be returned to the group member. In the example here, the leader chose to take points away from the group member. Finally, the group members share of the group pool will be added to this amount to calculate the total points for this period. Here the average contribution is shown – 5 points. This is multiplied by the pool multiplier and then added to give total points – 8.5 for this group member.

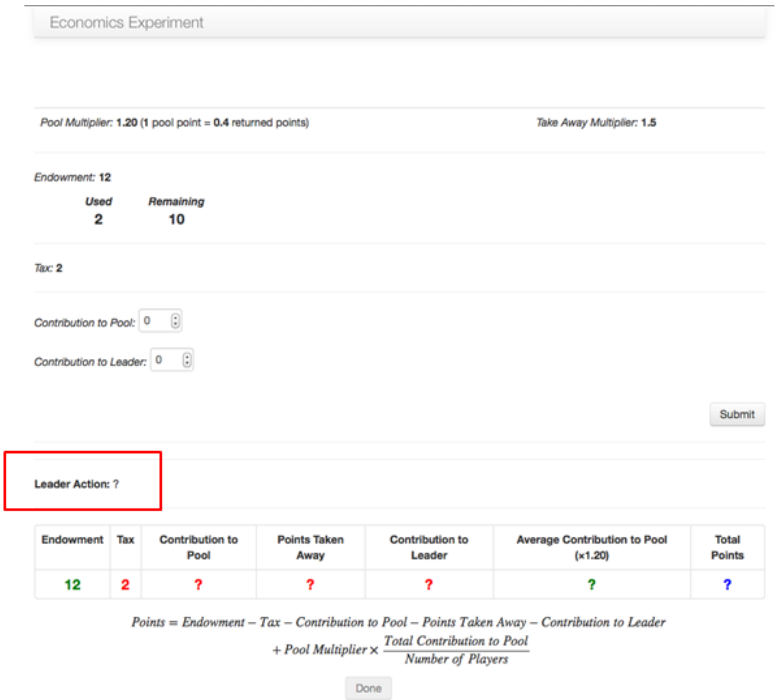


Please click "Done" at the bottom of the screen to move to the next period.

Please click "Continue" when you are ready to begin.

Subsequent Round

The difference between this round and previous rounds is that in this round, the leader automatically contributes the maximum amount to the group pool and may accept points from group members.



In addition, group members only see the leader's action towards them. They do not see the actions

of others group members or the leader's actions towards other group members. As in all rounds, all participants are completely anonymous.

Please click "Continue" when you are ready to begin.

Quiz Questions

1. How many periods will you play?
    a. 10 periods
    b. More than 10 periods
    c. Less than 10 periods
    d. An average of 10 periods, but possibly more and possibly less
2. If everyone contributes the same amount to the group pool, will you:
    a. Increase your points from your initial endowment
    b. Decrease your points from your initial endowment
    c. Have the same points as your initial endowment
    d. Might increase your points or might decrease your points
3. How much does the leader contribute to the group pool?
    a. However much they choose to allocate to the group pool
    b. 10 points
    c. Depends on the points given to the leader
    d. Depends on the group member's contributions
4. Which of the following can the leader NOT do?
    a. Nothing
    b. Accept points from a group member
    c. Take points away from a group member
    d. Accept points and take points away from the same group member
5. If a leader does not accept points where do these points go?
    a. Goes to the leader anyway
    b. Goes back to the group member
    c. Goes to the experimenter
    d. Is added to the group pool
6. What actions of other group members can group members (not leader) see?
    a. Leader's action towards them
    b. Leader's contribution
    c. Leader's contribution and all actions
    d. All group member and leader actions

Supplementary Results

Data Analyses

We analyzed our data using generalized linear mixed models (GLMM), calculating coefficients using a Monte Carlo-Markov Chain (MCMC) implemented by the R package *MCMCglmm*[7]. All Bayesian models pass the Gelman and Rubin[8] convergence diagnostic, implemented in the *gelman.diag* function of the *coda*[9] package. Categorical models are rescaled to log odds as per Hadfield[10] course notes for *MCMCglmm*. Confidence intervals (95%) were calculated as Highest Posterior Density (HPD) using the *HPDinterval* function in the *coda* package[9].

We provide a frequentist equivalent to each analysis (with no substantive difference in interpretation).

In all models, we account for the clustering inherent in the experimental design by including a fixed effect for the number of subjects and random effects for participants within groups.

All data is available at FigShare: https://doi.org/10.6084/m9.figshare.5004956

Predictions

Based on the logic that leaders can make more money by using money to extract bribes from every player than by increasing the size of the public good, we predict the following:

1. For the regression on contribution: $c = \beta_1 S + \beta_2 M + \epsilon$:
    a. $\beta_1 > 0$ in IPGG, i.e. stronger leaders result in higher contributions
    b. $\beta_1 < 0$ if BG, i.e. stronger leaders results in lower contributions
    c. $\beta_2 > 0$ in IPGG
    d. $\beta_2 \geq 0$ in BG (depending on prior contribution preferences)
2. For the regression on bribes: $b = \beta_1 S + \beta_2 M + \epsilon$:
    a. $\beta_1 > 0$, i.e. more bribes offered when leaders more powerful
    b. $\beta_2 \leq 0$, i.e. no change in bribes or less bribes offered when economic potential is higher
3. In the BG, for the regression on punishment: $p = \beta_1 c + \beta_2 b + \beta_3 b{\times}S + \beta_4 b{\times}M + \epsilon$:
    a. $\beta_3 < 0$, i.e. more punishment will be allocated for bribes when leaders are more powerful.
    b. $\beta_4 \leq 0$, i.e. no change in punishment based on economic potential, but if there is a change, it will be less when economic potential is higher.
4. By corollary, for the regression on Leader decisions: $Accept\ Bribe = \beta_1 S + \beta_2 M + \epsilon$:
    a. $\beta_1 > 0$, i.e. more acceptance of bribes (compared to doing nothing or punishing) when leaders are more powerful.

Variables

cContribution	Raw, centered contribution to public good
zContribution	z-score of contribution to public good
cBribe	Raw, centered bribe to Leader
zBribe	z-score of bribe to Leader
cPunishment	Raw, centered punishment
zPunishment	z-score of punishment
cPlayerExposureCorruption	Raw, centered player corruption score from countries they've lived in
zPlayerExposureCorruption	z-score of player corruption score from countries they've lived in
cLeaderExposureCorruption	Raw, centered leader corruption score from countries they've lived in
zLeaderExposureCorruption	z-score of leader corruption score from countries they've lived in
MPCR	Marginal per capita rate of return (0.3 or 0.6)
LeaderPower	Multiplier on leader punishment (1 or 3)
Cond	Treatment: Control=Public Goods Game; BG=Bribery Game; BG_Part_Trans = BG + Partial Transparency BG_Full_Trans = BG + Full Transparency BG_Leader= BG + Leader Investment
Period	Period of game – only first 10 were analyzed
Version	Depending on whether background questions were given before or after the game
Order	Each subject played 4 of 5 treatments. Order specifies the order in which they played that particular treatment
Subjects	Number of players in the group
Age	Age in years
Male	Gender (Male = 1; Female = 0)
PID	Participant ID
GroupNum	Group ID

Cost of Corruption

Here we compare behavior in the standard institutional punishment Public Goods Game to behavior in the Bribery Game – identical in all ways, except the additional option of the bribe. Here and in all cases, we show the R code for the model, with the output in a clean table format. The data and R code are available on DataDryad.

Contributions

Bayesian

Model

```
mcmcmodel <- MCMCglmm(cContribution ~ factor(MPCR)+factor(LeaderPower)
+ factor(Cond) + Period + factor(Version) + Subjects +
as.numeric(Order) + scale(age) + male, random=~PID:GroupNum,
data=levi[levi$Cond=="BG" | levi$Cond=="Control",])
```

For the standardized version, zContribution was regressed instead.

Results

	Coefficient	**95% CI**	**p-value**
Economic Potential	1.84	1.26, 2.50	$< .001$
Strong Leader	−0.41	−1.01, 0.20	.198
Bribery Game	−1.37	−1.54,−1.21	$< .001$
Period	−0.02	−0.04, 0.01	.142
Version	1.02	0.42, 1.61	$< .001$
Subjects	0.09	−0.21, 0.38	.560
Order	0.57	0.47, 0.68	$< .001$
Age	0.01	−0.30, 0.26	.976
Male	0.97	0.38, 1.61	.002
(Intercept)	−2.54	−4.12,−0.80	.004
Obs.		2716	
N		248	
Group Num.		56	
DIC		10650.22	

Table S1. MCMC GLMM regression on raw, unstandardized contribution.

	Coefficient	95% CI	p-value
Economic Potential	0.58	0.39, 0.78	< .001
Strong Leader	−0.13	−0.32, 0.09	.238
Bribery Game	−0.43	−0.49, −0.38	< .001
Period	−0.01	−0.01, 0.00	.188
Version	0.32	0.12, 0.52	.002
Subjects	0.29	−0.06, 0.11	.562
Order	0.18	0.15, 0.22	< .001
Age	0.00	−0.09, 0.08	.948
Male	0.31	0.12, 0.52	< .001
(Intercept)	−0.81	−1.35, −0.34	.002
Obs.		2716	
N		248	
Group Num.		56	
DIC		4394.94	

Table S2. MCMC GLMM regression on z-score of contribution to calculate standardized coefficients.

Frequentist

Model

```
model <- lmer(cContribution ~
factor(MPCR)+factor(LeaderPower)+factor(Cond) + Period +
factor(Version) + Subjects + Order +age+male+ (1| PID)+ (1 |
GroupNum), data= data=levi[levi$Cond=="BG" | levi$Cond=="Control",])
```

Results

	Coefficient	95% CI		p-value
Economic Potential	1.95	0.86,	3.04	.001
Strong Leader	−0.31	−1.41,	0.80	.602
Bribery Game	−1.39	−1.56,	−1.23	< .001
Period	−0.02	−0.04,	0.01	.144
Version	1.32	0.29,	2.32	.013
Subjects	0.08	−0.47,	0.64	.777
Order	0.54	0.43,	0.65	< .001
Age	−0.01	−0.05,	0.04	.851
Male	0.72	0.28,	1.17	.002
(Intercept)	−2.69	−5.83,	0.46	.109
Obs.	2716			
N	248			
Group Num.	56			
R^2	0.76			

Table S3. Multilevel model regressing raw, unstandardized contribution with random effects for participants within groups. The variance explained by both fixed and random factors[11,12] is $R^2 = 0.76$.

Standardized Score

	Coefficient	95% CI		p-value
Economic Potential	0.62	0.27,	0.96	.001
Strong Leader	−0.10	−0.45,	0.25	.602
Bribery Game	−0.44	0.39,	0.49	< .001
Period	−0.01	−0.01,	0.00	.144
Version	0.42	0.09,	0.73	.013
Subjects	0.03	−0.15,	0.20	.777
Order	0.17	0.14,	0.21	< .001
Age	0.00	−0.02,	0.01	.852
Male	0.23	0.09,	0.37	.002
(Intercept)	−0.85	−2.23,	−0.24	.109
Obs.	2716			
N	248			
Group Num.	56			
R^2	0.76			

Table S4. Multilevel model regressing z-score of contribution to calculate standardized coefficients, with random effects for participants within groups. The variance explained by both fixed and random factors[11,12] is $R^2 = 0.76$.

Causes of Corruption

Here we test the predictors of player contributions, bribes, and leader behavior:

Contributions

We predict a negative interaction between game (IPGG vs BG) and leader power (S) and between game and economic potential (M). That is, stronger leaders will increase contributions in the IPGG, but decrease contributions in BG. And higher economic potential will increase contributions in the IPGG, but will have no effect or a smaller effect in the BG.

Bayesian

Model

```
zContribution ~ factor(MPCR) * factor(Cond) + factor(LeaderPower) *
factor(Cond) + factor(Cond) + Period + factor(Version) + Subjects +
as.numeric(Order) + scale(age) + male
```

Results

	Coefficient	95% CI	p-value
High Economic Potential	2.01	1.39, 2.65	$< .001$
Bribery Game	−0.85	−1.16, −0.51	$< .001$
Strong Leader	−0.12	−0.80, 0.53	.756
Period	−0.06	−0.04, 0.01	.180
Version	1.01	0.43, 1.64	.002
Subjects	0.06	−0.23, 0.34	.654
Order	0.51	0.40, 0.63	$< .001$
Age	0.01	−0.25, 0.30	.974
Male	0.97	0.44, 1.58	$< .001$
High Economic Potential: Bribery Game	−0.40	−0.71, −0.05	.006
Bribery Game: Strong Leader	−0.57	−0.94, −0.22	$< .001$
(Intercept)	−2.52	−3.95, −0.57	.002
Obs.		2716	
N		248	
Group Num.		56	
DIC		10639.34	

Table S5. MCMC GLMM regression on raw, unstandardized contribution.

	Coefficient	95% CI	p-value
High Economic Potential	0.63	0.45, 0.85	< .001
Bribery Game	−0.27	−0.37, −0.16	< .001
Strong Leader	−0.04	−0.23, 0.17	.764
Period	−0.01	−0.01, 0.00	.164
Version	0.32	0.12, 0.52	.004
Subjects	0.02	−0.07, 0.11	.668
Order	0.16	0.13, 0.20	< .001
Age	0.00	−0.08, 0.09	.952
Male	0.31	0.10, 0.48	.006
High Economic Potential: Bribery Game	−0.12	−0.23, −0.03	.018
Bribery Game: Strong Leader	−0.18	−0.29, −0.06	.002
(Intercept)	−0.80	−1.32, −0.27	.004
Obs.		2716	
N		248	
Group Num.		56	
DIC		4382.554	

Table S6. MCMC GLMM regression on z-score of contribution to calculate standardized coefficients.

We can graph these effects:

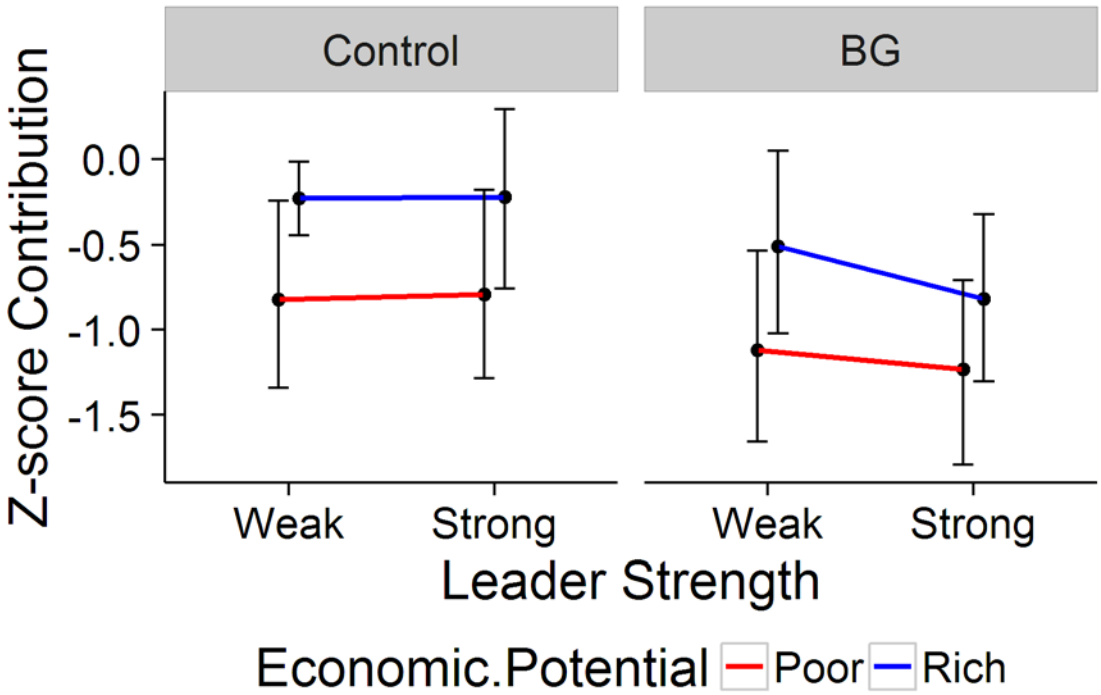


Figure S15. Comparison of contributions in the IPGG (Control) and BG for weak vs strong leaders by poor vs rich economic potential. Overall contributions are lower in BG in all

contexts. Overall contributions are higher in richer economic potential contexts. As predicted, when leaders are stronger, we see a slight increase in contributions in the IPGG, but a decrease in the BG. Also, as predicted, the effect of economic potential on increasing contributions is weaker in the BG compared to the IPGG.

Summary

These results partially support our hypothesis. Stronger leaders barely increase contributions in the IPGG, but clearly decrease contributions in the BG (as predicted). Moreover, the effect of richer economic potential is lower in the BG compared to the IPGG (as predicted).

Next, we test our prediction that stronger leaders increase bribes (rather than contributions) in the BG.

Frequentist

Model

```
cContribution ~ factor(MPCR) * factor(Cond) + factor(LeaderPower) *
factor(Cond) + factor(Cond) + Period + factor(Version) +
    Subjects + as.numeric(Order) + scale(age) + male + (1 | PID) +
(1 | GroupNum)
   Data: dat[dat$Cond == "BG" | dat$Cond == "Control", ]
```

Results

	Coefficient	95% CI	p-value
High Economic Potential	2.11	1.00, 3.22	$< .001$
Bribery Game	−0.86	−1.18, −0.54	$< .001$
Strong Leader	0.00	−1.13, 1.13	1.00
Period	−0.02	−0.04, 0.01	.149
Version	1.32	0.28, 2.32	.014
Subjects	0.06	−0.50, 0.62	.838
Order	0.47	0.35, 0.59	$< .001$
Age	−0.02	−0.22, 0.18	.825
Male	0.71	0.27, 1.16	.002
High Economic Potential: Bribery Game	−0.35	−0.68, −0.02	.041
Bribery Game: Strong Leader	−0.61	0.97, −0.24	.001
(Intercept)	−2.58	−5.61, 0.45	.112
Obs.		2716	
N		248	
Group Num.		56	
R^2		0.76	

Table S7. Multilevel model regressing raw, unstandardized contribution with random effects for participants within groups. The variance explained by both fixed and random factors[11,12] is $R^2 = 0.76$.

	Coefficient	95% CI	p-value
High Economic Potential	0.67	0.31, 1.02	.001
Bribery Game	−0.27	−0.37, −0.17	< .001
Strong Leader	0.00	−0.36, 0.36	.999
Period	−0.01	−0.01, 0.00	.149
Version	0.42	0.09, 0.73	.014
Subjects	0.02	−0.16, 0.20	.838
Order	0.15	0.11, 0.19	< .001
Age	−0.01	−0.07, 0.06	.825
Male	0.22	0.09, 0.37	.002
High Economic Potential: Bribery Game	−0.11	−0.22, −0.01	.041
Bribery Game: Strong Leader	−0.19	−0.31, −0.08	.001
(Intercept)	−0.81	−1.77, 0.14	.112
Obs.	2716		
N	248		
Group Num.	56		
R^2	0.76		

Table S8. Multilevel model regressing z-score of contribution to calculate standardized coefficients, with random effects for participants within groups. The variance explained by both fixed and random factors[11,12] is $R^2 = 0.76$.

Bribes

We predict a positive effect of leader power (S) on bribes, but no effect or a negative effect of economic potential (M). That is, stronger leaders will increase bribes.

Bayesian

Model

```
mcmcmodel <- MCMCglmm(zBribe ~ factor(MPCR) + factor(LeaderPower) +
                        Period + factor(Version) + Subjects +
                        as.numeric(Order) + scale(age) + male,
                      random=~PID:GroupNum,
                      data=dat[dat$Cond=="BG",])
```

Results

	Coefficient	95% CI	p-value
High Economic Potential	0.28	−0.03, 0.55	.056
Strong Leader	0.57	0.25, 0.87	< .001
Period	0.02	0.01, 0.03	< .001
Version	−0.34	−0.66, −0.04	.034
Subjects	−0.05	−0.20, 0.07	.414
Order	−0.14	−0.27, −0.01	.030
Age	−0.08	−0.22, 0.05	.246
Male	−0.05	−0.34, 0.26	.776
(Intercept)	0.52	−0.38, 1.38	.240
Obs.	1420		
N	176		
Group Num.	45		
DIC	3291.46		

Table S9. MCMC GLMM regression on raw, unstandardized bribe.

	Coefficient	95% CI	p-value
High Economic Potential	0.22	0.00, 0.44	.052
Strong Leader	0.45	0.19, 0.67	< .001
Period	0.02	0.01, 0.03	.002
Version	−0.28	−0.52, −0.04	.020
Subjects	−0.04	−0.14, 0.06	.448
Order	−0.11	−0.22, −0.01	.040
Age	−0.06	−0.17, 0.05	.272
Male	−0.04	−0.27, 0.19	.756
(Intercept)	0.43	−0.33, 1.06	.238
Obs.	1420		
N	176		
Group Num.	45		
DIC	2593.12		

Table S10. MCMC GLMM regression on z-score of bribe to calculate standardized coefficients.

We can graph these effects:

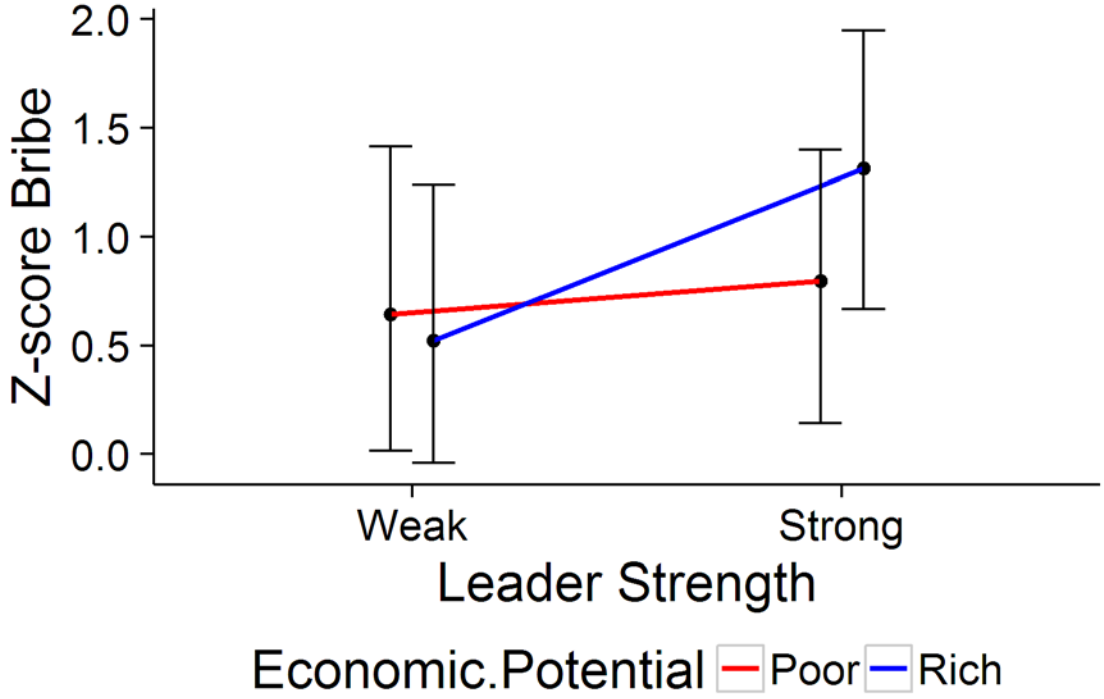


Figure S16. Comparison of bribes in the BG for weak vs strong leaders by poor vs rich economic potential. As predicted, when leaders are stronger, we see an increase in bribes.

Summary

As predicted, we find that stronger leaders extract larger bribes. Surprisingly, we find some possible evidence that this effect is stronger in richer economic potential than poorer. If these results generalize, one possible explanation for this is that Leader's and players have a non-zero norm for prosocial contributions. Leader's use punishment to achieve this minimum contribution. Since this contribution is more likely to be met in a richer economic potential context, leaders use more of their punitive power to extract bribes.

Next, we look at what predicts when Leaders will punish. If this hypothesis about leader's expecting a minimum contribution to the pubic good is correct, then we should see contributions predict punishment in the BG (not just bribes).

Frequentist

Model

```
model <- lmer(cBribe ~ factor(MPCR) + factor(LeaderPower) +
                       Period + factor(Version) + Subjects +
                       as.numeric(Order) + scale(age) + male +
                       (1|PID) + (1|GroupNum),
```

```
data=dat[dat$Cond=="BG",])
```

Results

	Coefficient	95% CI	p-value
High Economic Potential	0.36	−0.13, 0.85	.172
Strong Leader	0.74	0.24, 1.23	.009
Period	0.02	0.01, 0.03	.001
Version	−0.76	−1.26, −0.21	.007
Subjects	−0.04	−0.27, 0.19	.765
Order	−0.13	−0.36, 0.09	.268
Age	0.01	−0.11, 0.12	.873
Male	−0.11	−0.35, 0.14	.380
(Intercept)	0.56	−0.88, 2.00	.475
Obs.	1420		
N	176		
Group Num.	45		
R^2	0.70		

Table S11. Multilevel model regressing raw, unstandardized bribe with random effects for participants within groups. The variance explained by both fixed and random factors[11,12] is $R^2 = 0.70$.

	Coefficient	95% CI	p-value
High Economic Potential	0.29	−0.10, 0.66	.172
Strong Leader	0.58	0.19, 0.96	.009
Period	0.02	0.01, 0.03	.001
Version	−0.59	−0.99, −0.16	.007
Subjects	−0.03	−0.21, 0.15	.765
Order	−0.11	−0.28, 0.07	.268
Age	0.01	−0.09, 0.09	.873
Male	−0.09	−0.28, 0.11	.380
(Intercept)	0.44	−0.69, 1.56	.475
Obs.	1420		
N	176		
Group Num.	45		
R^2	0.70		

Table S12. Multilevel model regressing z-score of contribution to calculate standardized coefficients, with random effects for participants within groups. The variance explained by both fixed and random factors[11,12] is $R^2 = 0.70$.

Punishment

We predict that more punishments will be allocated to bribes and that Leader's will be less tolerant of small bribes when they have more power (they'll punish small bribes more).

Bayesian

Model

```
model <- lmer(cBribe ~ cPunishment ~ factor(MPCR) * cBribe +
factor(LeaderPower) * cBribe + factor(MPCR) * cContribution +
factor(LeaderPower) * cContribution + Period + factor(Version) +
Subjects + as.numeric(Order) + scale(age) + male,
                      data=dat[dat$Cond=="BG",])
```

Results

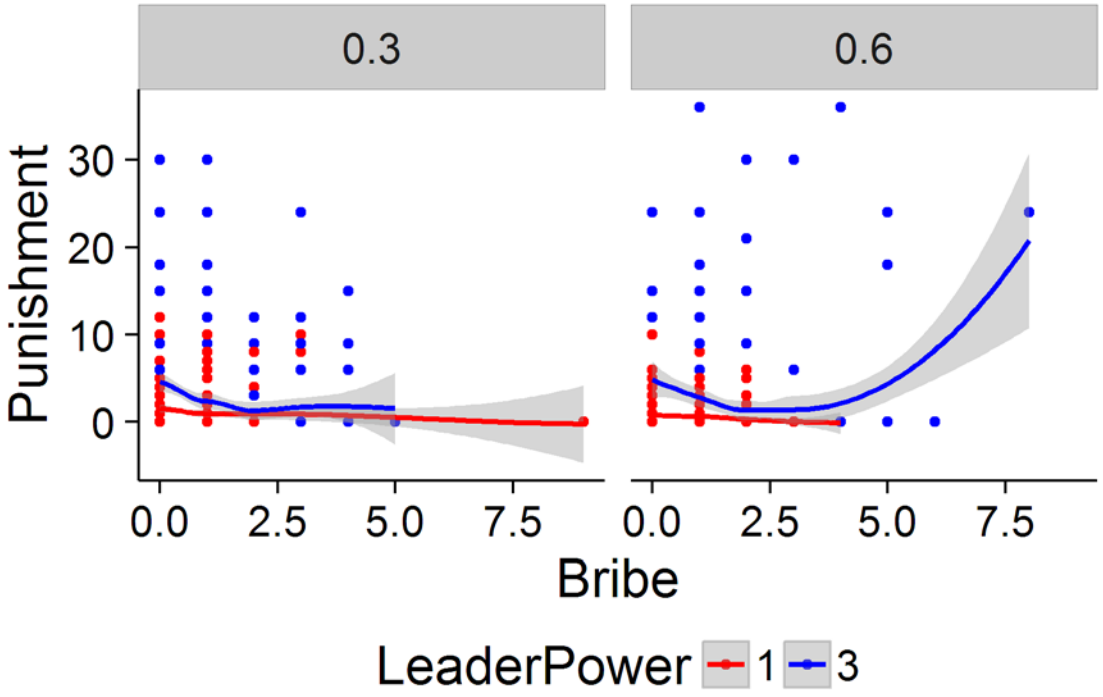
	Coefficient	95% CI	p-value
High Economic Potential	0.49	−0.26, 1.24	.226
Bribery	−0.85	−1.28, −0.42	< .001
Strong Leader	1.79	1.04, 2.54	< .001
Contribution	−0.22	−0.39, −0.06	.008
Period	0.07	−0.01, 0.13	.072
Version	−0.44	−1.22, 0.30	.244
Subjects	0.23	−0.06, 0.57	.150
Order	−0.44	−0.78, −0.09	.022
Age	−0.13	−0.51, 0.27	.462
Male	0.45	−0.34, 1.18	.250
High Economic Potential: Bribery	0.55	0.07, 1.04	.028
Bribery: Strong Leader	−0.47	−0.99, 0.03	.074
High Economic Potential: Contribution	0.23	0.01, 0.47	.056
Strong Leader: Contribution	−0.35	−0.54, −0.15	.004
(Intercept)	−1.63	−3.82, 0.61	.156
Obs.		1420	
N		176	
Group Num.		45	
DIC		8032.33	

Table S13. MCMC GLMM regression on raw, unstandardized punishment.

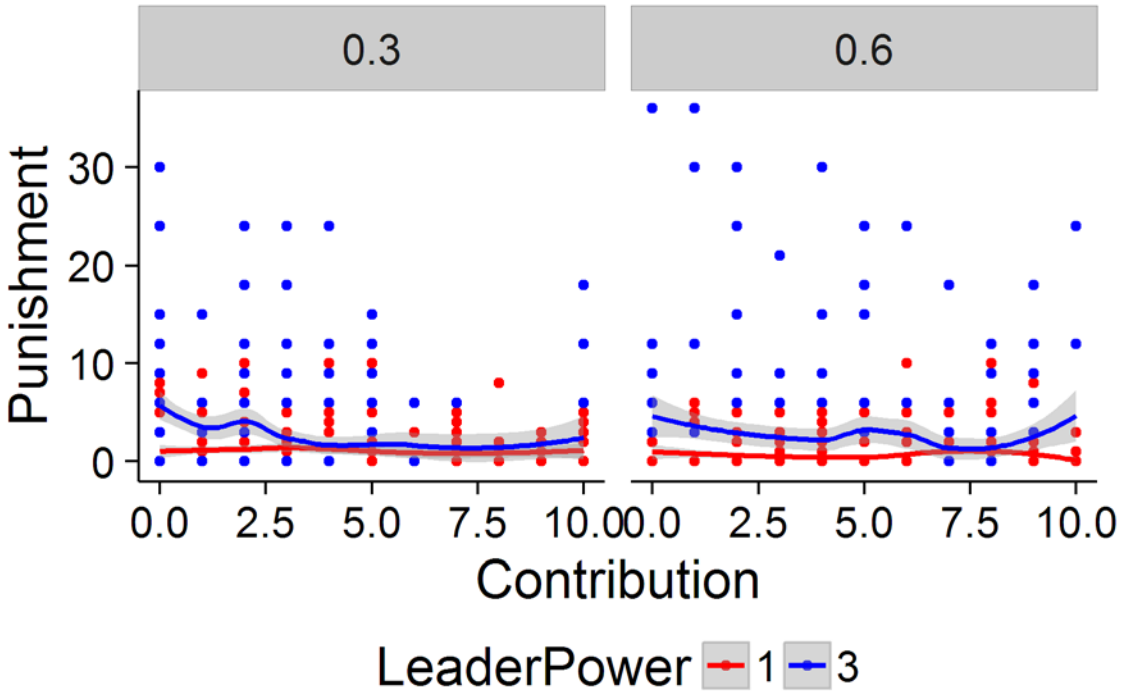
	Coefficient	95% CI	p-value
High Economic Potential	0.11	−0.07, 0.29	.232
Bribery	−0.25	−0.37, −0.12	< .001
Strong Leader	0.41	0.24, 0.58	< .001
Contribution	−0.16	−0.28, −0.02	.010
Period	0.02	0.00, 0.03	.070
Version	−0.10	−0.28, 0.07	.280
Subjects	0.05	−0.02, 0.13	.140
Order	−0.10	−0.18, −0.02	.022
Age	−0.03	−0.12, 0.05	.466
Male	0.10	−0.07, 0.27	.248
High Economic Potential: Bribery	0.16	0.03, 0.31	.024
Bribery: Strong Leader	−0.14	−0.28, 0.01	.070
High Economic Potential: Contribution	0.17	−0.01, 0.32	.040
Strong Leader: Contribution	−0.25	−0.40, −0.11	< .001
(Intercept)	−0.39	−0.90, 0.10	.140
Obs.		1420	
N		176	
Group Num.		45	
DIC		3801.53	

Table S14. MCMC GLMM regression on z-score of punishment to calculate standardized coefficients.

We can graph contributions and bribes against punishment (this is the actual data, not controlling for effects):



(a)



(b)

Figure S17. Punishment plotted against (a) Bribes and (b) Contribution. Loess curve to show pattern. High contributions, and certainly high bribes, are rare, but the overall pattern suggests more punishments allocated for both low contributions and low bribes.

Summary

As predicted, we find that more powerful leaders are more punitive towards smaller bribes (though this effect is marginally significant). Surprisingly, even in the BG, more powerful leaders are also more likely to punish smaller contributions. These results suggest that Leader's possess either a pro-social or anti-corruption norm. Curiously, smaller bribes and contributions both receive smaller punishments when in a richer economic context. It is possible that in this richer economic context, contributions are more in line with Leader expectations, based purely on the norm and economic potential. If this is the case, we should expect that Leaders are more likely to do nothing or to accept bribes when economic potential is greater.

Frequentist

Model

```
model <- lmer(zPunishment ~ factor(MPCR)*zBribe +
factor(LeaderPower)*zBribe + factor(MPCR)*zContribution +
factor(LeaderPower)*zContribution +
                Period + factor(Version) + Subjects +
                as.numeric(Order) + scale(age) + male +
                (1|PID) + (1|GroupNum),
              data=dat[dat$Cond=="BG",])
```

Results

	Coefficient	95% CI	p-value
High Economic Potential	0.70	−0.35, 1.65	.214
Bribery	−0.93	−1.34, −0.47	< .001
Strong Leader	2.04	0.99, 3.00	.001
Contribution	−0.27	−0.45, −0.07	.008
Period	0.07	−0.01, 0.14	.068
Version	−0.93	−1.92, 0.22	.112
Subjects	0.23	−0.21, 0.67	.363
Order	−0.40	−0.85, 0.05	.128
Age	−0.02	−0.39, 0.30	.919
Male	0.40	−0.33, 1.13	.303
High Economic Potential: Bribery	0.66	0.12, 1.16	.014
Bribery: Strong Leader	−0.65	−1.13, −0.06	.02
High Economic Potential: Contribution	0.23	0.00, 0.47	.062
Strong Leader: Contribution	−0.38	−0.59, −0.15	.001
(Intercept)	−1.67	−4.55, 1.19	.307
Obs.	1420		
N	176		
Group Num.	45		
R^2	0.34		

Table S15. Multilevel model regressing raw, unstandardized punishment with random effects for participants within groups. The variance explained by both fixed and random factors[11,12] is $R^2 = 0.76$.

	Coefficient	95% CI	p-value
High Economic Potential	0.16	−0.08, 0.37	.214
Bribery	−0.27	−0.39, −0.14	< .001
Strong Leader	0.46	0.22, 0.68	.001
Contribution	−0.19	−0.32, −0.05	.008
Period	0.02	0.00, 0.03	.068
Version	−0.21	−0.43, 0.05	.112
Subjects	0.05	−0.05, 0.15	.363
Order	−0.09	−0.19, 0.01	.128
Age	0.00	−0.09, 0.07	.919
Male	0.09	−0.08, 0.25	.303
High Economic Potential: Bribery	0.19	0.04, 0.33	.014
Bribery: Strong Leader	−0.19	−0.33, −0.02	.016
High Economic Potential: Contribution	0.17	0.00, 0.34	.062
Strong Leader: Contribution	−0.27	−0.42, −0.10	.001
(Intercept)	−0.38	−1.03, 0.27	.307
Obs.		1420	
N		176	
Group Num.		45	
R^2		0.34	

Table S16. Multilevel model regressing raw, unstandardized punishment with random effects for participants within groups. The variance explained by both fixed and random factors[11,12] is $R^2 = 0.34$.

Leader Decisions

We predict that stronger leaders should accept more bribes.

Bayesian

Model

```
mcmcmodel.bribe <- MCMCglmm(LeaderDec_Bribe ~
factor(MPCR)+factor(LeaderPower) + Period + factor(Version) + Subjects
+ as.numeric(Order) + scale(age) + male,
                      random=~PID:GroupNum, data=dat[dat$Cond=="BG",],
family = "categorical", burnin=50000,nitt=1000000,thin=5000)
mcmcmodel.punish <- MCMCglmm(LeaderDec_Punish ~
factor(MPCR)+factor(LeaderPower) + Period + factor(Version) + Subjects
+ as.numeric(Order) + scale(age) + male,
                      random=~PID:GroupNum, data=dat[dat$Cond=="BG",],
family = "categorical", burnin=50000,nitt=1000000,thin=5000)
mcmcmodel.nothing <- MCMCglmm(LeaderDec_Nothing ~
factor(MPCR)+factor(LeaderPower) + Period + factor(Version) + Subjects
+ as.numeric(Order) + scale(age) + male,
                      random=~PID:GroupNum, data=dat[dat$Cond=="BG",],
family = "categorical", burnin=50000,nitt=1000000,thin=5000)
mcmcmodel.punish.pgg <- MCMCglmm(LeaderDec_Punish ~ factor(MPCR) +
factor(LeaderPower) + Period + factor(Version) + Subjects +
as.numeric(Order) + scale(age) + male,
```

```
                                    random=~PID:GroupNum,
data=levi_subset_var[levi_subset_var$Cond=="Control",], family =
"categorical", burnin=50000,nitt=1000000,thin=5000)
```

Results

	Accept Bribe	Punish	Do Nothing
High Economic Potential	1.33 [0.79,1.98]	0.81 [0.50,1.19]	0.84 [0.38,1.49]
Strong Leader	1.91 [1.11,3.03]	1.06 [0.69,1.69]	0.38 [0.14,0.67]
Period	1.02 [0.98,1.09]	1.00 [0.95,1.05]	0.97 [0.91,1.03]
Version	0.92 [0.48,1.46]	1.29 [0.76,1.91]	1.10 [0.37,1.87]
Subjects	1.04 [0.81,1.26]	1.19 [0.98,1.45]	0.82 [0.58,1.08]
Order	1.21 [0.94,1.49]	0.81 [0.64,0.98]	0.93 [0.63,1.24]
Age	0.91 [0.77,1.08]	0.85 [0.69,1.03]	1.24 [1.02,1.52]
Male	0.68 [0.49,0.93]	1.32 [0.93,1.71]	1.33 [0.84,1.80]
(Intercept)	0.74 [0.05,1.91]	0.16 [0.01,0.37]	1.94 [0.05,6.79]
Obs.	1396	1396	1396
N	175	175	175
Groups	45	45	45
DIC	37.93	20.07	20.47

Table S17. MCMC GLMM categorical regression (equivalent to logistic regression) of each leader decision against the other two decisions.

	Do Nothing
High Economic Potential	0.84 [0.51,1.19]
Strong Leader	1.06 [0.63,1.37]
Period	1.03 [0.98,1.07]
Version	1.33 [0.85,1.95]
Subjects	1.14 [0.96,1.43]
Order	1.40 [1.17,1.62]
Age	0.95 [0.78,1.21]
Male	1.17 [0.78,1.53]
(Intercept)	0.40 [0.07,0.85]
Obs.	1296
N	161
Groups	43
DIC	35.08

Table S18. MCMC GLMM categorical regression (equivalent to logistic regression) of doing nothing compared to punishing in Control (IPGG).

Summary

In line with our predictions, the only robust effect is that more powerful leaders are almost twice as likely to accept bribes and more than 2.5 times less likely to do nothing.

Yet, since leaders are also punishing for low contributions, our results suggest that something other than pure rational behavior as captured by our model is at play. Cultural evolutionary models suggest that people may internalize norms, which then influence their behavior. Next we test the effect of exposure to norms on player and Leader behaviors.

Frequentist

Model

```
model.bribe <- multinom(LeaderDec_Bribe ~
factor(MPCR)+factor(LeaderPower) +
                          Period + factor(Version) + Subjects +
                          as.numeric(Order) + scale(age) + male,
                          random=~ 1|LeaderID/GroupNum,
                        data=dat[dat$Cond=="BG",], family = binomial)
```

Results

	Accept Bribe	Punish	Do Nothing
High Economic Potential	1.43 [1.14,1.78]	0.75 [0.57,0.97]	0.80 [0.61,1.05]
Strong Leader	1.57 [1.25,1.98]	1.05 [0.81,1.38]	0.49 [0.37,0.65]
Period	1.01 [0.97,1.05]	1.01 [0.97,1.05]	0.98 [0.94,1.02]
Version	0.75 [0.59,0.95]	1.38 [1.04,1.83]	1.09 [0.81,1.45]
Subjects	1.02 [0.93,1.12]	1.19 [1.06,1.33]	0.80 [0.71,0.90]
Order	1.14 [1.03,1.25]	0.88 [0.78,0.98]	0.95 [0.84,1.07]
Age	0.87 [0.78,0.98]	0.84 [0.70,1.00]	1.29 [1.13,1.46]
Male	0.67 [0.53,0.84]	1.30 [1.00,1.69]	1.35 [1.02,1.78]
(Intercept)	0.73 [0.37,1.45]	0.13 [0.06,0.29]	1.44 [0.62,3.36]
Obs.	1396	1396	1396
N	175	175	175
Groups	45	45	45
AIC	1915.58	1500.68	1434.64

Table S19. Multilevel logistic regression of each leader decision against the other two decisions, with random effects for players within groups.

	Do Nothing
High Economic Potential	0.82 [0.64,1.04]
Strong Leader	0.99 [0.77,1.26]
Period	1.03 [0.99,1.07]
Version	1.27 [1.00,1.62]
Subjects	1.13 [0.99,1.29]
Order	1.36 [1.22,1.52]
Age	0.96 [0.85,1.08]
Male	1.15 [0.90,1.46]
(Intercept)	0.34 [0.15,0.79]
Obs.	1296
N	161
Groups	43
AIC	1667.04

Table S20. Multilevel logistic regression of each leader decision of doing nothing compared to punishing in Control (IPGG).

Exposure to Norms

Here we test how exposure to corruption norms affect behavior in our game. We do so by using our exposure score (a mean of the corruption perceptions of the countries the participant has lived in) and the heritage corruption score (a mean of the corruption perceptions of the countries the participant has an ethnic heritage). Since there is no incentive to offer bribes or contribute, except when compelled to do so by punishment, we predict that exposure to norms should primarily affect Leader decisions. Nonetheless, internalized norms may also affect the behavior of players in contributing and bribing.

We want to test the effect of direct exposure to corruption norms, but we would also like to control for heritage exposure (i.e. do these norms affect individuals who have lived in these countries, but are not natives to these corrupt countries). Similarly, we want to see the effect of heritage norms, but also look at the effect on second generation migrants and beyond, by controlling for actual direct exposure by having lived in a more corrupt country. The correlation between the direct exposure and heritage measures of corruption is $r = 0.67, p < .001$. To check if we can include both variables in our model, we check the Variance Inflation Factor on a fixed effect version of our model. These are reported for all models below.

We are interested in the effect norms have on player behavior as well as leader behavior. In each case, we run a model with player norms, with leader norms, and with both player and leader norms.

Summary

All the analyses tell a consistent story—the participants in our experiment whose families came from countries with high corruption, were themselves less likely to engage in corruption. We see no effect

of direct exposure to corruption, until we control for these individuals. Then we see that direct exposure to corruption norms results in increased corrupt behavior—i.e. in our Canadian sample, those who have lived in corrupt countries from which they do not derive their heritage behave in more corrupt ways. These data are consistent with second generation migrants acculturating to local Canadian norms and also with selection in the previous generation for low corruption—i..e. those who preferred less corruption moved to Canada in the previous generation. Our data do not allow us to distinguish between these explanations, however, assuming no differential selection pressures between generations, the behavior of Canadians with direct exposure to corruption norms suggests this might be a case of acculturation (that is those with direct exposure behave in a more corrupt mannner, suggesting that the parents of those with a heritage that included corrupt nations were also more corrupt, but their children are less corrupt).

Contributions

Do corruption norms affect contributions? We look at the effect of corruption norms in the BG.

VIF

```
model <- lm(zContribution ~ factor(MPCR)+
              factor(LeaderPower)+
              zPlayerExposureCorruption +
              zPlayerHeritageCorruption +
              zLeaderExposureCorruption +
              zLeaderHeritageCorruption +
              Period + factor(Version) + Subjects +
              as.numeric(Order) + scale(age) + male,
            data=dat.norms[dat.norms$Cond=="BG",])
```

All corruption norm variables have VIF<2.5.

Variable	VIF
Player Exposure Corruption Score	1.83
Player Heritage Corruption Score	1.87
Leader Exposure Corruption Score	1.62
Leader Heritage Corruption Score	1.68

Table S21. VIF Scores for OLS regression on contribution.

Bayesian

Effect of Norms on Contributions

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
High Economic Potential	0.54***	0.53***	0.52***	0.54***	0.54***	0.53***	0.53***
Strong Leader	−0.18	−0.20	−0.19	−0.18	−0.18	−0.18	−0.20
Player Exposure Corruption Score	0.00		−0.06				−0.05
Player Heritage Corruption Score		0.06	0.09				0.08
Leader Exposure Corruption Score				0.01		0.01	0.01
Leader Heritage Corruption Score					0.01	0.01	0.01
Period	−0.02**	−0.02***	−0.02***	−0.02***	−0.02**	−0.02***	−0.02***
Version	0.31*	0.31*	0.31*	0.31*	0.32**	0.31*	0.31*
Subjects	0.00	0.00	−0.01	0.00	0.00	0.00	−0.01
Order	0.18***	0.19***	0.19***	0.18***	0.19***	0.19***	0.19***
Age	0.09	0.08	0.08	0.09	0.09	0.09	0.08
Male	0.29*	0.29*	0.29*	0.29*	0.28*	0.28*	0.28*
(Intercept)	−0.98**	−0.98**	−0.94**	−0.98**	−0.99**	−0.97**	−0.94**
Obs.	1396	1396	1396	1396	1396	1396	1396
N	175	175	175	175	175	175	175
Groups	45	45	45	45	45	45	45
DIC	2140.53	2141.27	2140.08	2143.13	2141.65	2144.77	2144.90

Table S22. MCMC GLMM regression on z-score of contribution.

We find no evidence that leader corruption norms affect contributions. We find a small effect suggesting that players with a heritage that includes countries with high corruption norms actually contribute more and players with direct exposure to corruption contribute less, but this effect is not significant. Note that leadership is randomly assigned, so the effect of leaders must occur via shaping the norms of the groups they are in. We can test this by checking if mean contributions are higher in groups where heritage corruption scores are higher.

How do corruption norms in groups affect mean of contributions?

We calculate the mean contribution within each group and predict this with the mean of corruption norms.

	Coefficient	95% CI		p-value
High Economic Potential	0.58	0.15,	1.02	.006
Strong Leader	−0.07	−0.54,	0.35	.744
Exposure Corruption Score	−0.06	−0.73,	0.53	.866
Heritage Corruption Score	0.01	−0.59,	0.68	.968
Version	0.23	−0.19,	0.71	.340
Subjects	−0.04	−0.23,	0.18	.678
Order	0.16	−0.05,	0.35	.118
Mean Age	0.11	−0.11,	0.32	.318
Percent Male	0.36	−0.49,	1.21	.402
(Intercept)	−0.87	−2.18,	0.61	.208
Obs.	1396			
N	175			
Group Num.	45			
DIC	112.30			

Table S23. MCMC GLMM regression of mean of z-score of contributions in each group on mean corruption scores of players in the group.

No clear patterns emerge at the group level. Next we look at how corruption norms affect bribing behavior.

Frequentist

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
High Economic Potential	0.59**	0.59**	0.58**	0.59**	0.59**	0.59**	0.58**
Strong Leader	−0.13	−0.15	−0.15	−0.13	−0.14	−0.14	−0.15
Player Exposure Corruption Score	0.00		−0.06				−0.06
Player Heritage Corruption Score		0.06	0.10				0.10
Leader Exposure Corruption Score				0.01		0.00	0.00
Leader Heritage Corruption Score					0.01	0.01	0.01
Period	−0.02***	−0.02***	−0.02***	−0.02***	−0.02***	−0.02***	−0.02***
Version	0.26	0.25	0.27	0.26	0.26	0.26	0.27
Subjects	−0.01	−0.02	−0.02	−0.01	−0.01	−0.01	−0.02
Order	0.16	0.15	0.15	0.16	0.15	0.15	0.15
Age	0.06	0.06	0.05	0.06	0.06	0.06	0.05
Male	0.24**	0.24**	0.24**	0.24**	0.24**	0.24**	0.24**
(Intercept)	−0.84	−0.82	−0.81	−0.84	−0.83	−0.83	−0.79
Obs.	1396	1396	1396	1396	1396	1396	1396
N	175	175	175	175	175	175	175
Groups	45	45	45	45	45	45	45
R^2	0.75	0.75	0.75	0.75	0.75	0.75	0.75

Table S24. Multilevel model regressing z-score of contribution.

	Coefficient	95% CI		p-value
High Economic Potential	0.59	0.14,	1.04	.011
Strong Leader	−0.08	−0.55,	0.40	.742
Exposure Corruption Score	−0.06	−0.67,	0.55	.840
Heritage Corruption Score	0.01	−0.62,	0.64	.968
Version	0.22	−0.26,	0.70	.353
Subjects	−0.03	−0.25,	0.18	.748
Order	0.15	−0.06,	0.36	.156
Mean Age	0.11	−0.12,	0.34	.347
Percent Male	0.34	−0.50,	1.18	.423
(Intercept)	−0.88	−2.31,	0.55	.220
Obs.		1396		
N		175		
Group Num.		45		
R^2		0.29		

Table S25. OLS regression of mean of z-score of contributions in each group on mean corruption scores of players in the group.

Bribes

VIF

Variable	VIF
Player Exposure Corruption Score	1.22
Player Heritage Corruption Score	1.83
Leader Exposure Corruption Score	1.62
Leader Heritage Corruption Score	1.68

Table S26. VIF Scores for OLS regression on bribes.

Effect of Norms on Bribes

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
High Economic Potential	0.21	0.22	0.23	0.22	0.23	0.23	0.24*
Strong Leader	0.44***	0.46***	0.46***	0.44***	0.45***	0.45***	0.48***
Player Exposure Corruption Score	−0.03		0.04				0.04
Player Heritage Corruption Score		−0.08	−0.10				−0.10
Leader Exposure Corruption Score				−0.01		0.01	0.01
Leader Heritage Corruption Score					−0.03	−0.04	−0.04
Period	0.02**	0.02***	0.02***	0.02**	0.02**	0.02**	0.02**
Version	−0.28*	−0.28*	−0.28*	−0.28*	−0.29*	−0.29*	−0.28*
Subjects	−0.05	−0.04	−0.04	−0.04	−0.03	−0.04	−0.03
Order	−0.11	−0.11*	−0.11*	−0.11*	−0.11	−0.11	−0.11*
Age	−0.06	−0.05	−0.05	−0.06	−0.06	−0.06	−0.05
Male	−0.04	−0.04	−0.04	−0.04	−0.04	−0.04	−0.05
(Intercept)	0.43	0.42	0.39	0.41	0.38	0.38	0.35
Obs.	1396	1396	1396	1396	1396	1396	1396
N	175	175	175	175	175	175	175
Groups	45	45	45	45	45	45	45
DIC	2559.57	2558.78	2559.65	2561.71	2558.88	2559.87	2560.08

Table S27. MCMC GLMM regression on z-score of bribe.

How do corruption norms in group affect bribe behavior in group

	Coefficient	95% CI	p-value
High Economic Potential	0.33	−0.07, 0.74	.132
Strong Leader	0.47	0.02, 0.89	.044
Exposure Corruption Score	−0.02	−0.58, 0.56	.936
Heritage Corruption Score	−0.06	−0.63, 0.50	.832
Version	−0.37	−0.84, 0.06	.098
Subjects	0.01	−0.18, 0.21	.956
Order	−0.10	−0.30, 0.08	.344
Mean Age	−0.19	−0.40, 0.02	.088
Percent Male	0.03	−0.73, 0.87	.914
(Intercept)	0.20	−1.11, 1.49	.764
Obs.	1396		
N	175		
Group Num.	45		
DIC	107.33		

Table S28. MCMC GLMM regression of mean of z-score of bribes in each group on mean corruption scores of players in the group.

Again, similar to contributions and not statistically significant, we find that direct exposure results in higher bribes, but heritage lower bribes.

Frequentist

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
High Economic Potential	0.29	0.30	0.30	0.29	0.30	0.30	0.31
Strong Leader	0.58**	0.60**	0.60**	0.58**	0.59**	0.59**	0.61**
Player Exposure Corruption Score	−0.02		0.04				0.04
Player Heritage Corruption Score		−0.07	−0.10				−0.10
Leader Exposure Corruption Score				−0.10		0.02	0.02
Leader Heritage Corruption Score					−0.03	−0.04	−0.04
Period	0.02**	0.02**	0.02**	0.02**	0.02**	0.02**	0.02**
Version	−0.59**	−0.60**	−0.60**	−0.60**	−0.60**	−0.61**	−0.61**
Subjects	−0.03	−0.02	−0.02	−0.03	−0.02	−0.02	−0.02
Order	−0.10	−0.10	−0.10	−0.10	−0.10	−0.10	−0.10
Age	0.01	0.02	0.02	0.01	0.01	0.01	0.02
Male	−0.08	−0.09	−0.09	−0.08	−0.08	−0.08	−0.09
(Intercept)	0.42	0.39	0.38	0.42	0.39	0.39	0.35
Obs.	1396	1396	1396	1396	1396	1396	1396
N	175	175	175	175	175	175	175
Groups	45	45	45	45	45	45	45
R^2	0.70	0.70	0.70	0.70	0.70	0.70	0.70

Table S29. Multilevel model regressing z-score of bribe.

	Coefficient	95% CI	p-value
High Economic Potential	0.33	−0.09, 0.76	.119
Strong Leader	0.47	0.02, 0.92	.043
Exposure Corruption Score	−0.04	−0.62, 0.53	.883
Heritage Corruption Score	−0.04	−0.64, 0.56	.898
Version	−0.36	−0.81, 0.09	.116
Subjects	0.00	−0.20, 0.21	.970
Order	−0.09	−0.29, 0.11	.378
Mean Age	−0.19	−0.42, 0.03	.084
Percent Male	0.05	−0.75, 0.84	.906
(Intercept)	0.18	−1.18, 1.53	.795
Obs.	1396		
N	175		
Group Num.	45		
R^2	0.27		

Table S30. OLS regression of mean of z-score of bribes in each group on mean corruption scores of players in the group.

Leader Decision

Players have no incentive to offer bribes, other than to avoid punishment. If exposure to norms affect bribery, we should expect that leader's who have been directly exposed to more corrupt norms accept more bribes (rather than punishing or doing nothing).

VIF

Variable	VIF
Player Exposure Corruption Score	1.84
Player Heritage Corruption Score	1.89
Leader Exposure Corruption Score	1.64
Leader Heritage Corruption Score	1.72

Table S31. VIF Scores for logistic regression on leader decision to accept bribe compared to not accepting bribe.

Variable	VIF
Player Exposure Corruption Score	1.81
Player Heritage Corruption Score	1.83
Leader Exposure Corruption Score	1.67
Leader Heritage Corruption Score	1.70

Table S32. VIF Scores for logistic regression on leader decision to punish compared to not punishing.

Variable	VIF
Player Exposure Corruption Score	1.66
Player Heritage Corruption Score	1.69
Leader Exposure Corruption Score	1.62
Leader Heritage Corruption Score	1.71

Table S33. VIF Scores for logistic regression on leader decision to do nothing compared to not doing nothing.

Bayesian

Model

```
mcmcmodel.bribe <- MCMCglmm(LeaderDec_Bribe ~
factor(MPCR)+factor(LeaderPower) +
                              zPlayerExposureCorruption +
                              zPlayerHeritageCorruption +
                              Period + factor(Version) + Subjects +
as.numeric(Order) +
                              scale(age) + male,
                            random=~LeaderID:GroupNum,
data=dat.norms[dat.norms$Cond=="BG",], family = "categorical",
burnin=50000,nitt=1000000,thin=5000)
mcmcmodel.bribe <- MCMCglmm(LeaderDec_Punish ~
factor(MPCR)+factor(LeaderPower) +
                              zPlayerExposureCorruption +
                              zPlayerHeritageCorruption +
                              Period + factor(Version) + Subjects +
as.numeric(Order) +
                              scale(age) + male,
                            random=~LeaderID:GroupNum,
data=dat.norms[dat.norms$Cond=="BG",], family = "categorical",
burnin=50000,nitt=1000000,thin=5000)
mcmcmodel.bribe <- MCMCglmm(LeaderDec_Nothing ~
factor(MPCR)+factor(LeaderPower) +
                              zPlayerExposureCorruption +
                              zPlayerHeritageCorruption +
                              Period + factor(Version) + Subjects +
as.numeric(Order) +
                              scale(age) + male,
                            random=~LeaderID:GroupNum,
data=dat.norms[dat.norms$Cond=="BG",], family = "categorical",
burnin=50000,nitt=1000000,thin=5000)
```

Results

Accept Bribe

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
High Economic Potential	1.36 [0.66,2.11]	1.36 [0.74,2.04]	1.38 [0.72,2.07]	1.36 [0.69,2.08]	1.38 [0.68,2.09]	1.42 [0.64,2.24]	1.37 [0.65,2.21]
Strong Leader	1.98 [1.09,3.20]	2.09 [1.19,3.62]	2.18 [1.10,3.48]	2.02 [0.86,3.09]	1.98 [1.03,3.05]	2.12 [1.26,3.41]	2.14 [1.18,3.36]
Player Exposure Corruption Score	0.92 [0.80,1.06]		1.22 [1.00,1.47]				1.22 [1.01,1.44]
Player Heritage Corruption Score		0.74 [0.62,0.84]	0.65 [0.53,0.78]				0.65 [0.54,0.79]
Leader Exposure Corruption Score				0.95 [0.70,1.26]		1.17 [0.80,1.57]	1.16 [0.85,1.57]
Leader Heritage Corruption Score					0.82 [0.62,1.06]	0.76 [0.56,1.09]	0.74 [0.50,1.01]
Period	1.03 [0.98,1.08]	1.03 [0.98,1.07]	1.03 [0.99,1.09]	1.03 [0.99,1.08]	1.03 [0.98,1.07]	1.03 [0.96,1.07]	1.03 [0.97,1.08]
Version	0.94 [0.60,1.50]	0.94 [0.49,1.53]	0.91 [0.49,1.43]	0.89 [0.43,1.53]	0.87 [0.47,1.32]	0.89 [0.39,1.53]	0.92 [0.47,1.51]
Subjects	1.05 [0.82,1.29]	1.07 [0.84,1.27]	1.07 [0.79,1.31]	1.04 [0.82,1.32]	1.08 [0.85,1.35]	1.09 [0.82,1.32]	1.08 [0.85,1.35]
Order	1.22 [0.93,1.53]	1.21 [0.97,1.52]	1.20 [0.92,1.53]	1.19 [0.90,1.47]	1.23 [0.91,1.52]	1.22 [0.90,1.49]	1.20 [0.92,1.46]
Age	0.90 [0.75,1.06]	0.94 [0.77,1.10]	0.96 [0.82,1.13]	0.90 [0.74,1.07]	0.90 [0.76,1.07]	0.90 [0.75,1.08]	0.94 [0.80,1.12]
Male	0.70 [0.51,0.95]	0.69 [0.49,0.87]	0.68 [0.49,0.91]	0.71 [0.50,0.97]	0.71 [0.53,0.96]	0.71 [0.51,0.90]	0.71 [0.46,0.88]
(Intercept)	0.65 [0.04,1.56]	0.57 [0.09,1.61]	0.59 [0.05,1.47]	0.73 [0.11,2.25]	0.61 [0.04,1.73]	0.58 [0.03,1.67]	0.57 [0.05,1.54]
Obs.	1396	1396	1396	1396	1396	1396	1396
N	175	175	175	175	175	175	175
Groups	45	45	45	45	45	45	45
DIC	36.56	36.22	35.86	36.63	36.42	35.97	36.13

Table S34. MCMC GLMM categorical regression (equivalent to logistic regression) for leader decision to accept bribe compared to not accepting bribes.

Punish

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
High Economic Potential	0.78 [0.52,1.17]	0.79 [0.49,1.16]	0.77 [0.45,1.13]	0.79 [0.50,1.12]	0.78 [0.47,1.18]	0.81 [0.47,1.15]	0.79 [0.41,1.14]
Strong Leader	1.15 [0.73,1.69]	1.13 [0.50,1.63]	1.09 [0.59,1.57]	1.11 [0.66,1.66]	1.10 [0.69,1.66]	1.11 [0.63,1.60]	1.08 [0.60,1.61]
Player Exposure Corruption Score	1.10 [0.94,1.28]		0.99 [0.82,1.20]				0.99 [0.81,1.19]
Player Heritage Corruption Score		1.15 [0.96,1.29]	1.17 [0.99,1.42]				1.17 [0.96,1.40]
Leader Exposure Corruption Score				1.16 [0.89,1.46]		1.16 [0.85,1.54]	1.15 [0.81,1.52]
Leader Heritage Corruption Score					1.10 [0.86,1.36]	1.04 [0.76,1.33]	1.02 [0.74,1.35]
Period	1.01 [0.96,1.06]	1.00 [0.95,1.06]	1.00 [0.95,1.06]	1.00 [0.95,1.06]	1.00 [0.95,1.07]	1.00 [0.96,1.07]	1.00 [0.95,1.06]
Version	1.24 [0.68,1.90]	1.21 [0.62,1.92]	1.24 [0.78,1.91]	1.32 [0.80,2.04]	1.28 [0.76,1.94]	1.27 [0.64,1.88]	1.26 [0.74,1.84]
Subjects	1.22 [0.98,1.46]	1.21 [0.96,1.47]	1.21 [0.92,1.50]	1.21 [0.96,1.46]	1.20 [0.96,1.44]	1.20 [0.96,1.46]	1.21 [0.95,1.47]
Order	0.82 [0.67,0.98]	0.81 [0.66,0.99]	0.82 [0.66,0.99]	0.81 [0.65,0.97]	0.82 [0.66,0.98]	0.82 [0.66,0.98]	0.81 [0.64,0.97]
Age	0.83 [0.64,1.00]	0.83 [0.69,1.03]	0.84 [0.68,1.01]	0.84 [0.67,0.99]	0.84 [0.69,1.06]	0.84 [0.67,1.00]	0.82 [0.65,0.99]
Male	1.30 [0.93,1.64]	1.31 [0.92,1.70]	1.31 [0.96,1.74]	1.32 [1.00,1.82]	1.31 [0.88,1.78]	1.34 [0.93,1.76]	1.27 [0.90,1.64]
(Intercept)	0.12 [0.01,0.31]	0.14 [0.02,0.39]	0.14 [0.02,0.38]	0.14 [0.02,0.44]	0.15 [0.01,0.37]	0.14 [0.01,0.39]	0.16 [0.02,0.39]
Obs.	1396	1396	1396	1396	1396	1396	1396
N	175	175	175	175	175	175	175
Groups	45	45	45	45	45	45	45
DIC	19.26	19.43	19.07	19.37	19.12	18.95	18.23

Table S35. MCMC GLMM categorical regression (equivalent to logistic regression) for leader decision to punish compared to not punishing.

Do Nothing

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
High Economic Potential	0.92 [0.40,1.61]	0.91 [0.32,1.58]	0.86 [0.32,1.56]	0.92 [0.34,1.50]	0.84 [0.38,1.46]	0.86 [0.36,1.42]	0.81 [0.29,1.40]
Strong Leader	0.37 [0.12,0.69]	0.32 [0.15,0.60]	0.32 [0.14,0.54]	0.35 [0.13,0.65]	0.33 [0.11,0.60]	0.32 [0.08,0.62]	0.29 [0.10,0.50]
Player Exposure Corruption Score	1.02 [0.80,1.19]		0.77 [0.63,0.97]				0.79 [0.63,1.02]
Player Heritage Corruption Score		1.33 [1.14,1.59]	1.57 [1.28,1.94]				1.55 [1.25,1.89]
Leader Exposure Corruption Score				0.97 [0.67,1.39]		0.80 [0.45,1.20]	0.75 [0.42,1.09]
Leader Heritage Corruption Score					1.26 [0.74,1.80]	1.53 [0.80,2.44]	1.60 [0.99,2.43]
Period	0.96 [0.90,1.02]	0.97 [0.91,1.02]	0.97 [0.91,1.04]	0.97 [0.91,1.03]	0.96 [0.89,1.02]	0.97 [0.91,1.02]	0.97 [0.91,1.03]
Version	1.21 [0.36,2.29]	1.14 [0.45,2.17]	1.18 [0.42,2.11]	1.18 [0.51,2.27]	1.24 [0.39,2.38]	1.28 [0.43,2.43]	1.22 [0.52,2.12]
Subjects	0.81 [0.55,1.05]	0.78 [0.53,1.05]	0.78 [0.53,1.06]	0.79 [0.58,1.03]	0.79 [0.52,1.03]	0.77 [0.52,1.02]	0.73 [0.52,0.96]
Order	0.95 [0.69,1.34]	0.94 [0.65,1.26]	0.93 [0.69,1.26]	0.95 [0.70,1.31]	0.93 [0.67,1.31]	0.92 [0.60,1.24]	0.92 [0.66,1.17]
Age	1.22 [0.98,1.45]	1.19 [0.96,1.44]	1.18 [0.97,1.42]	1.22 [0.97,1.42]	1.21 [0.99,1.40]	1.22 [1.01,1.52]	1.19 [1.01,1.41]
Male	1.33 [0.86,1.77]	1.33 [0.86,1.85]	1.31 [0.86,1.76]	1.31 [0.92,1.90]	1.33 [0.90,1.74]	1.28 [0.81,1.75]	1.33 [0.86,2.01]
(Intercept)	2.03 [0.02,6.50]	2.38 [0.10,8.91]	2.43 [0.07,9.24]	1.81 [0.08,6.96]	2.38 [0.07,8.24]	2.98 [0.06,7.99]	3.01 [0.12,9.50]
Obs.	1396	1396	1396	1396	1396	1396	1396
N	175	175	175	175	175	175	175
Groups	45	45	45	45	45	45	45
DIC	19.74	19.47	19.05	19.62	19.50	19.24	18.45

Table S36. MCMC GLMM categorical regression (equivalent to logistic regression) for leader decision to do nothing compared to not doing nothing.

Frequentist

Model

```
model <- multinom(LeaderDec_Bribe ~ factor(MPCR)+factor(LeaderPower) +
                            zPlayerExposureCorruption +
                            zPlayerHeritageCorruption +
                            Period + factor(Version) + Subjects +
                            as.numeric(Order) + scale(age) + male,
                          random=~ 1|LeaderID/GroupNum,
                          data=dat.norms[dat.norms$Cond=="BG",], family
= binomial)
model <- multinom(LeaderDec_Punish ~ factor(MPCR)+factor(LeaderPower)
+
                            zPlayerExposureCorruption +
                            zPlayerHeritageCorruption +
                            Period + factor(Version) + Subjects +
                            as.numeric(Order) + scale(age) + male,
                          random=~ 1|LeaderID/GroupNum,
```

```
                          data=dat.norms[dat.norms$Cond=="BG",], family
= binomial)
model <- multinom(LeaderDec_Nothing ~ factor(MPCR)+factor(LeaderPower)
+
                            zPlayerExposureCorruption +
                            zPlayerHeritageCorruption +
                            Period + factor(Version) + Subjects +
                            as.numeric(Order) + scale(age) + male,
                          random=~ 1|LeaderID/GroupNum,
                          data=dat.norms[dat.norms$Cond=="BG",], family
= binomial)
```

Results

Accept Bribe

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
High Economic Potential	1.42 [1.14,1.78]	1.45 [1.16,1.81]	1.47 [1.18,1.85]	1.43 [1.14,1.79]	1.48 [1.18,1.86]	1.49 [1.19,1.87]	1.54 [1.23,1.94]
Strong Leader	1.61 [1.27,2.04]	1.70 [1.34,2.16]	1.69 [1.33,2.14]	1.61 [1.28,2.04]	1.72 [1.35,2.18]	1.74 [1.37,2.20]	1.84 [1.44,2.34]
Player Exposure Corruption Score	0.98 [0.88,1.10]		1.24 [1.06,1.43]				1.22 [1.05,1.42]
Player Heritage Corruption Score		0.82 [0.73,0.91]	0.71 [0.61,0.82]				0.70 [0.61,0.82]
Leader Exposure Corruption Score				0.93 [0.83,1.04]		1.07 [0.93,1.23]	1.06 [0.92,1.22]
Leader Heritage Corruption Score					0.83 [0.74,0.93]	0.79 [0.68,0.92]	0.79 [0.68,0.92]
Period	1.01 [0.97,1.05]	1.01 [0.97,1.05]	1.01 [0.97,1.05]	1.01 [0.97,1.05]	1.01 [0.98,1.05]	1.01 [0.97,1.05]	1.01 [0.98,1.05]
Version	0.74 [0.58,0.94]	0.74 [0.58,0.94]	0.75 [0.59,0.95]	0.73 [0.58,0.93]	0.71 [0.56,0.91]	0.71 [0.56,0.91]	0.72 [0.56,0.92]
Subjects	1.02 [0.58,0.94]	1.03 [0.93,1.14]	1.04 [0.95,1.15]	1.03 [0.93,1.13]	1.05 [0.95,1.16]	1.05 [0.95,1.16]	1.07 [0.97,1.19]
Order	1.13 [1.02,1.24]	1.12 [1.02,1.24]	1.12 [1.02,1.24]	1.13 [1.02,1.25]	1.13 [1.02,1.25]	1.13 [1.02,1.25]	1.13 [1.02,1.25]
Age	0.88 [0.78,0.98]	0.90 [0.80,1.02]	0.91 [0.81,1.03]	0.88 [0.78,0.99]	0.88 [0.78,0.99]	0.88 [0.78,0.99]	0.92 [0.81,1.03]
Male	0.67 [0.53,0.85]	0.66 [0.52,0.83]	0.66 [0.52,0.83]	0.67 [0.53,0.84]	0.66 [0.52,0.83]	0.66 [0.53,0.84]	0.65 [0.51,0.82]
(Intercept)	0.72 [0.36,1.43]	0.68 [0.34,1.36]	0.64 [0.32,1.28]	0.70 [0.35,1.40]	0.61 [0.31,1.23]	0.60 [0.30,1.21]	0.53 [0.26,1.08]
Obs.	1396	1396	1396	1396	1396	1396	1396
N	175	175	175	175	175	175	175
Groups	45	45	45	45	45	45	45
AIC	1885.43	1872.36	1866.51	1884.00	1875.63	1876.85	1859.06

Table S37. Multilevel logistic regression of each leader decision to accept bribe compared to not accepting bribe, with random effects for players within groups.

Punish

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
High Economic Potential	0.73 [0.55,0.95]	0.72 [0.55,0.95]	0.72 [0.55,0.94]	0.72 [0.55,0.94]	0.70 [0.53,0.92]	0.71 [0.54,0.93]	0.70 [0.54,0.92]
Strong Leader	1.10 [0.84,1.45]	1.09 [0.83,1.43]	1.09 [0.83,1.44]	1.10 [0.84,1.45]	1.05 [0.79,1.38]	1.08 [0.81,1.42]	1.06 [0.80,1.41]
Player Exposure Corruption Score	1.01 [0.89,1.15]		0.94 [0.79,1.12]				0.94 [0.79,1.12]
Player Heritage Corruption Score		1.07 [0.94,1.22]	1.11 [0.94,1.32]				1.13 [0.95,1.34]
Leader Exposure Corruption Score				1.20 [1.05,1.36]		1.14 [0.96,1.34]	1.14 [0.96,1.35]
Leader Heritage Corruption Score					1.18 [1.03,1.36]	1.09 [0.91,1.30]	1.09 [0.91,1.31]
Period	1.01 [0.97,1.06]	1.01 [0.97,1.06]	1.01 [0.97,1.06]	1.01 [0.96,1.05]	1.01 [0.97,1.06]	1.01 [0.96,1.05]	1.01 [0.96,1.05]
Version	1.32 [0.99,1.76]	1.32 [0.99,1.75]	1.31 [0.98,1.75]	1.34 [1.00,1.78]	1.35 [1.01,1.80]	1.35 [1.01,1.80]	1.34 [1.01,1.79]
Subjects	1.20 [1.08,1.35]	1.20 [1.07,1.34]	1.20 [1.07,1.34]	1.21 [1.08,1.35]	1.18 [1.06,1.33]	1.20 [1.07,1.35]	1.19 [1.06,1.34]
Order	0.86 [0.77,0.97]	0.87 [0.77,0.97]	0.87 [0.77,0.97]	0.86 [0.76,0.97]	0.86 [0.76,0.97]	0.86 [0.76,0.97]	0.86 [0.76,0.97]
Age	0.84 [0.70,1.01]	0.83 [0.69,1.00]	0.83 [0.69,1.00]	0.83 [0.69,1.00]	0.84 [0.70,1.01]	0.83 [0.69,1.00]	0.82 [0.68,0.99]
Male	1.27 [0.97,1.67]	1.28 [0.98,1.67]	1.27 [0.97,1.66]	1.32 [1.01,1.73]	1.30 [0.99,1.70]	1.32 [1.01,1.73]	1.32 [1.01,1.73]
(Intercept)	0.12 [0.06,0.28]	0.13 [0.06,0.29]	0.13 [0.06,0.29]	0.12 [0.05,0.28]	0.14 [0.06,0.32]	0.13 [0.06,0.30]	0.14 [0.06,0.31]
Obs.	1396	1396	1396	1396	1396	1396	1396
N	175	175	175	175	175	175	175
Groups	45	45	45	45	45	45	45
AIC	1469.06	1468.02	1469.57	1462.11	1463.53	1463.24	1465.40

Table S38. Multilevel logistic regression of each leader decision to punish compared to not punishing, with random effects for players within groups.

Do Nothing

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
High Economic Potential	0.83 [0.63,1.09]	0.81 [0.62,1.07]	0.80 [0.61,1.05]	0.83 [0.63,1.09]	0.81 [0.62,1.06]	0.79 [0.60,1.04]	0.76 [0.58,1.00]
Strong Leader	0.46 [0.35,0.61]	0.43 [0.32,0.57]	0.44 [0.33,0.58]	0.46 [0.35,0.62]	0.44 [0.33,0.59]	0.43 [0.32,0.57]	0.40 [0.30,0.54]
Player Exposure Corruption Score	1.02 [0.89,1.17]		0.80 [0.68,0.95]				0.81 [0.68,0.96]
Player Heritage Corruption Score		1.27 [1.11,1.46]	1.46 [1.23,1.74]				1.47 [1.23,1.75]
Leader Exposure Corruption Score				0.94 [0.82,1.08]		0.82 [0.69,0.97]	0.82 [0.69,0.97]
Leader Heritage Corruption Score					1.12 [0.97,1.29]	1.28 [1.07,1.53]	1.29 [1.08,1.55]
Period	0.98 [0.93,1.02]	0.98 [0.93,1.02]	0.97 [0.93,1.02]	0.98 [0.94,1.02]	0.98 [0.93,1.02]	0.98 [0.94,1.02]	0.98 [0.93,1.02]
Version	1.18 [0.88,1.59]	1.18 [0.87,1.58]	1.17 [0.87,1.57]	1.18 [0.88,1.59]	1.21 [0.90,1.63]	1.23 [0.91,1.66]	1.21 [0.90,1.64]
Subjects	0.78 [0.69,0.89]	0.78 [0.69,0.88]	0.76 [0.67,0.86]	0.79 [0.70,0.89]	0.77 [0.68,0.87]	0.77 [0.68,0.87]	0.74 [0.65,0.85]
Order	0.97 [0.86,1.10]	0.98 [0.86,1.11]	0.98 [0.86,1.11]	0.97 [0.86,1.10]	0.97 [0.86,1.10]	0.97 [0.86,1.10]	0.98 [0.86,1.11]
Age	1.27 [1.12,1.45]	1.23 [1.09,1.40]	1.23 [1.08,1.40]	1.28 [1.13,1.46]	1.27 [1.12,1.45]	1.29 [1.13,1.47]	1.24 [1.08,1.41]
Male	1.36 [1.02,1.79]	1.41 [1.06,1.87]	1.41 [1.06,1.87]	1.34 [1.01,1.77]	1.37 [1.03,1.81]	1.34 [1.01,1.78]	1.40 [1.05,1.86]
(Intercept)	1.52 [0.65,3.55]	1.59 [0.68,3.73]	1.71 [0.73,4.04]	1.48 [0.63,3.46]	1.69 [0.72,4.00]	1.74 [0.74,4.11]	1.99 [0.83,4.75]
Obs.	1396	1396	1396	1396	1396	1396	1396
N	175	175	175	175	175	175	175
Groups	45	45	45	45	45	45	45
AIC	1415.05	1403.08	1398.64	1414.44	1412.65	1409.36	1394.64

Table S39. Multilevel logistic regression of each leader decision to do nothing compared to not doing nothing, with random effects for players within groups.

Next, we look at whether anti-corruption measures can return contributions to the levels seen in the IPGG, when bribery is not a option.

Cures for Corruption

Here we report the full regression discussed in the main text. Partial transparency may work by revealing or establishing contribution norms and full transparency may work by revealing contribution and bribe norms, as well as the leader's punitive preferences. Leader investment can only work by increasing a leader's tendency to punish for lack of contributions rather than lack of bribes, but this is only likely to work when economic potential is high.

Bayesian

	Coefficient	95% CI	p-value
Economic Potential	0.76	0.52, 1.00	< .001
Bribery Game	−0.21	−0.31,−0.11	< .001
Partial Transparency	−0.31	−0.39,−0.21	< .001
Full Transparency	−0.20	−0.30,−0.11	< .001
Leader Investment	−0.46	−0.55,−0.36	< .001
Strong Leader	0.17	−0.08, 0.40	.202
Period	0.01	0.00, 0.01	< .001
Version	0.24	0.05, 0.40	.006
Subjects	0.02	−0.06, 0.09	.680
Order	0.15	0.13, 0.16	< .001
Age	−0.02	−0.10, 0.05	.642
Male	0.25	0.07, 0.41	.004
Economic Potential:Bribery Game	−0.18	−0.33,−0.04	.014
Economic Potential:Partial Transparency	0.01	−0.13, 0.13	.928
Economic Potential:Full Transparency	0.05	−0.10, 0.18	.446
Economic Potential:Leader Investment	0.31	0.18, 0.44	< .001
Economic Potential:Strong Leader	−0.25	−0.59, 0.11	.172
Bribery Game:Strong Leader	−0.31	−0.46,−0.18	< .001
Part Transparency:Strong Leader	−0.22	−0.36,−0.09	< .001
Full Transparency:Strong Leader	0.15	−0.01, 0.28	.048
Leader Investment:Strong Leader	0.29	0.15, 0.44	< .001
Economic Potential:Bribery Game:Strong Leader	0.13	−0.05, 0.33	.222
Economic Potential:Partial Transparency:Strong Leader	0.09	−0.11, 0.28	.404
Economic Potential:Full Transparency:Strong Leader	−0.25	−0.46,−0.07	.020
Economic Potential:Leader Investment:Strong Leader	−0.36	−0.56,−0.16	< .001
(Intercept)	−0.85	−1.30,−0.41	< .001
Obs.		6766	
N		273	
Group Num.		56	
DIC		12433.28	

Table S40. The coefficients in Figure 1 of the main text are derived from this MCMC GLMM regression on the z-score of contribution. The coefficients of interest can be calculated by changing the reference groups, changing the meaning of the "main effects" in the model. For example, the the coefficient of bribery game in this table is the difference between the BG treatment and the IPGG when Economic Potential and Strong Leader are zero.

Frequentist

	Coefficient	95% CI	p-value
Economic Potential	0.80	0.36, 1.23	.001
Bribery Game	−0.21	−0.31, −0.11	< .001
Full Transparency	−0.20	−0.29, −0.10	< .001
Leader Investment	−0.46	−0.56, −0.36	< .001
Partial Transparency	−0.31	−0.40, −0.22	< .001
Strong Leader	0.19	−0.25, 0.63	.432
Period	0.01	0.00, 0.01	.002
Version	0.38	0.08, 0.66	.013
Subjects	−0.01	−0.16, 0.15	.952
Order	0.15	0.13, 0.16	< .001
Age	0.00	−0.06, 0.06	.964
Male	0.20	0.07, 0.32	.002
Economic Potential:Bribery Game	−0.18	−0.33, −0.04	.013
Economic Potential:Full Transparency	0.04	−0.10, 0.18	.562
Economic Potential:Leader Investment	0.31	0.16, 0.45	< .001
Economic Potential:PartialTransparency	0.00	−0.13, 0.13	.950
Economic Potential:Strong Leader	−0.31	−0.93, 0.31	.344
Bribery Game:Strong Leader	−0.31	−0.46, −0.17	< .001
Full Transparency:Strong Leader	0.15	0.00, 0.29	.049
Leader Investment:Strong Leader	0.29	0.14, 0.44	< .001
Partial Transparency:Strong Leader	−0.22	−0.36, −0.08	.002
Economic Potential:Bribery Game:Strong Leader	0.14	−0.06, 0.33	.179
Economic Potential:Full Transparency:Strong Leader	−0.25	−0.45, −0.05	.016
Economic Potential:Leader Investment:Strong Leader	−0.35	−0.55, −0.15	.001
Economic Potential:Partial Transparency:Strong Leader	0.09	−0.11, 0.28	.367
(Intercept)	−0.81	−1.66, 0.04	.080
Obs.		6766	
N		273	
Group Num.		56	
R^2		0.68	

Table S41. Multilevel model regressing z-score of contribution, with random effects for participants within groups. . The variance explained by both fixed and random factors[11,12] is $R^2 = 0.68$.

Leader Investment

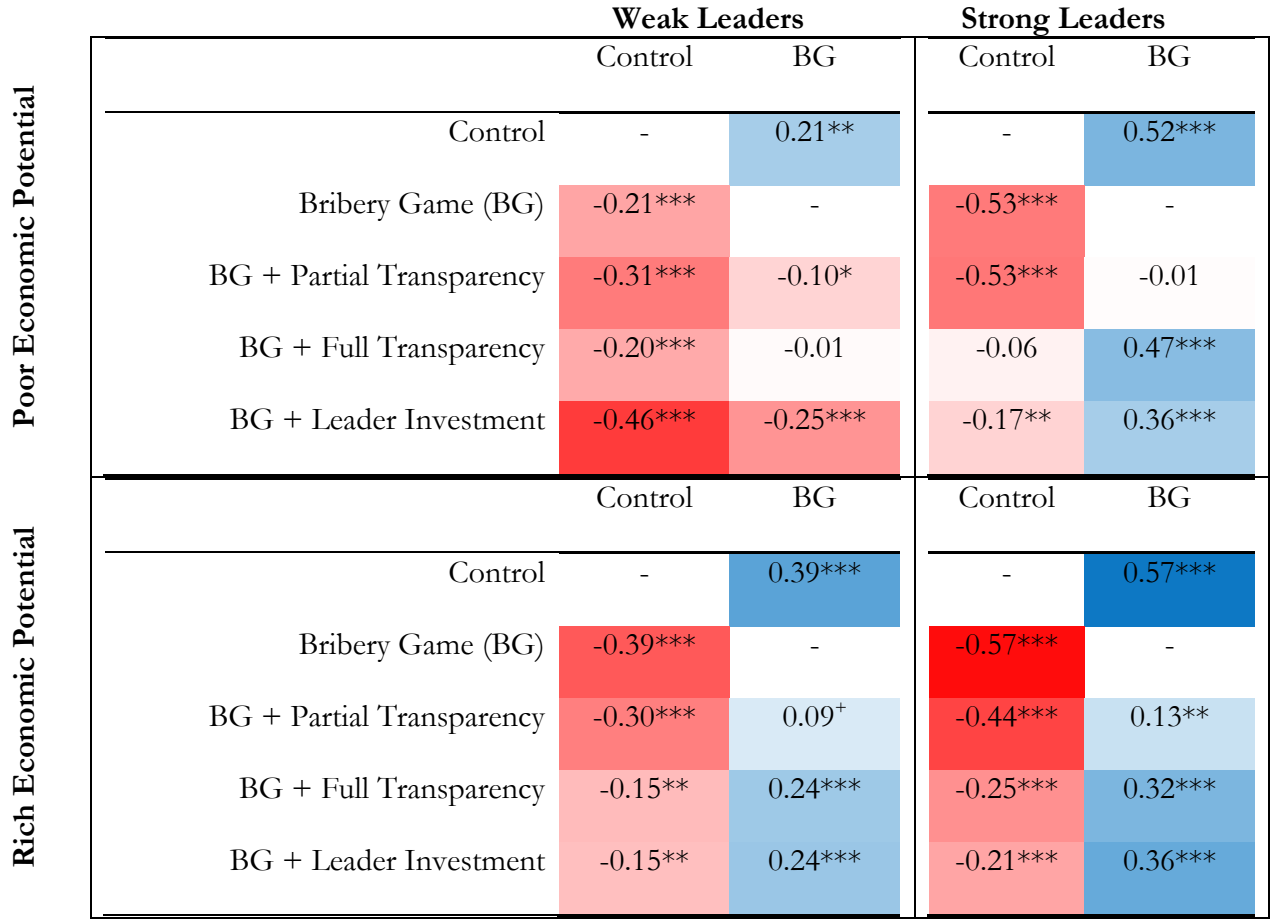


Figure S18. Figure 2 from Main Text with Leader Investment included. Corruption mitigation effectively increases contributions (though not to control levels) when leaders are strong or economic potential is rich. When leaders are weak and economic potential is poor, the apparent corruption mitigation strategy Full Transparency has no effect and Partial Transparency and Leader Investment further decrease contributions.

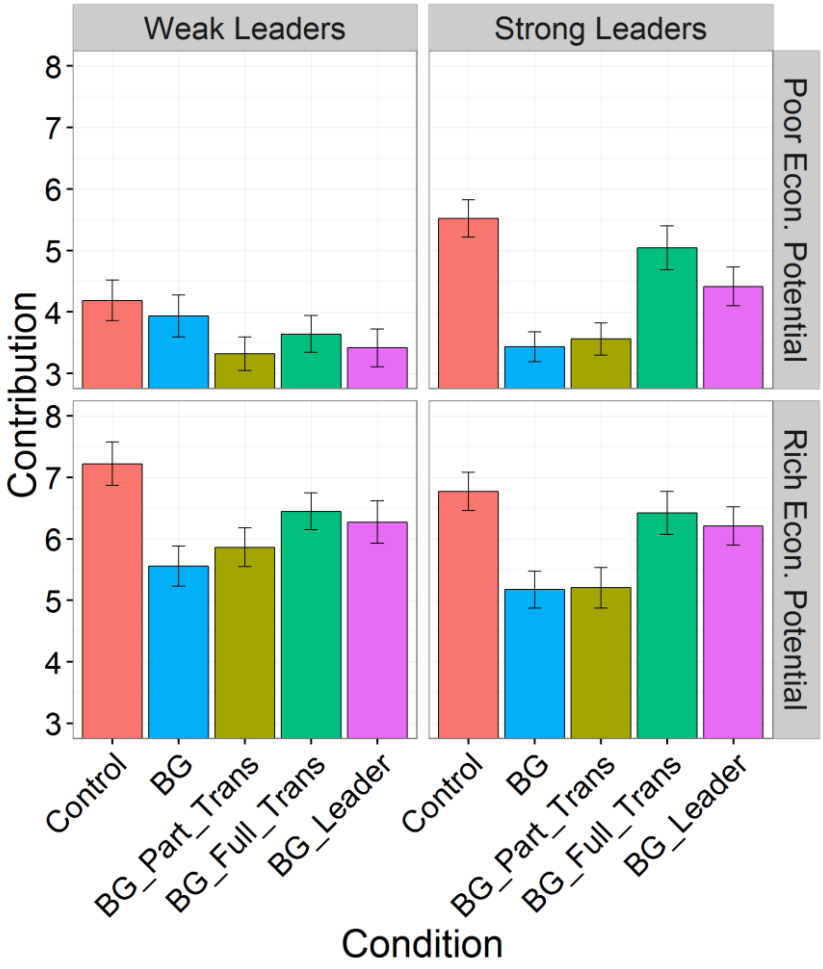


Figure S19. Figure 3 from Main Text with Leader Investment Included.

Preferences for characteristics of the game world

Questions

One more question - after having played several different versions of this game, if you were to play one more game where you chose the rules, what would you do?

In my version of the game...

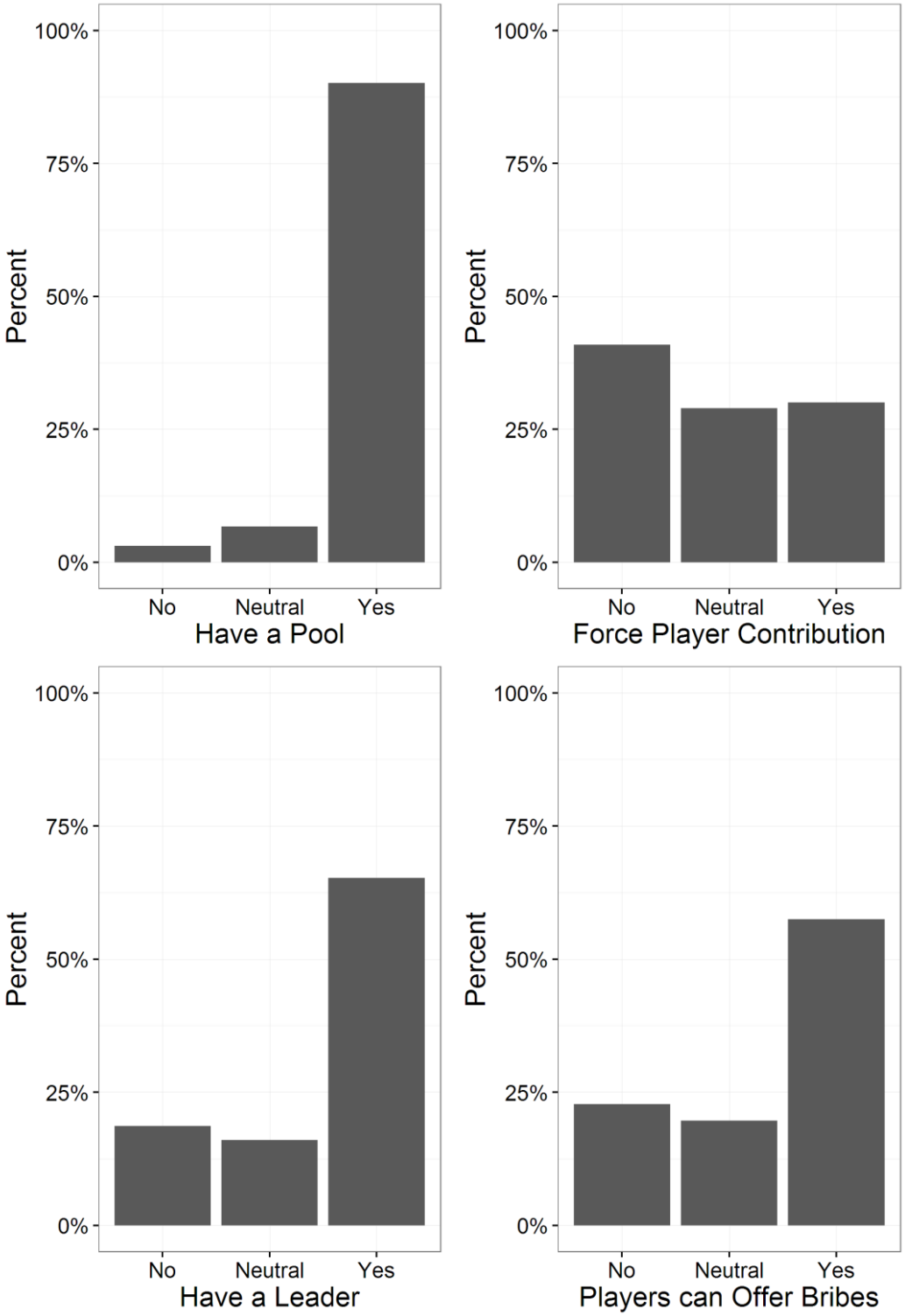
There would be a Pool	○ ○ ○	There would be NO Pool
Players would be forced to contribute 10 points	○ ○ ○	Players would NOT be forced to contribute
There would be a Leader	○ ○ ○	There would be NO Leader
The Leader could punish players	○ ○ ○	The Leader could NOT punish players
The Leader could accept payments from players	○ ○ ○	The Leader could NOT accept payments from players
The Pool Multiplier would be HIGHER	○ ○ ○	The Pool Multiplier would be LOWER
The Take Away Multiplier would be HIGHER	○ ○ ○	The Take Away Multiplier would be LOWER
The Leader would be forced to contribute 10 points	○ ○ ○	The Leader would NOT be forced to contribute
The Leader's contribution would be visible to all players	○ ○ ○	The Leader's contribution would NOT be visible to all players
Players could contribute to the Leader	○ ○ ○	Players could NOT contribute to the Leader
All Player's actions would be visible to everyone	○ ○ ○	All Player's actions would NOT be visible to everyone

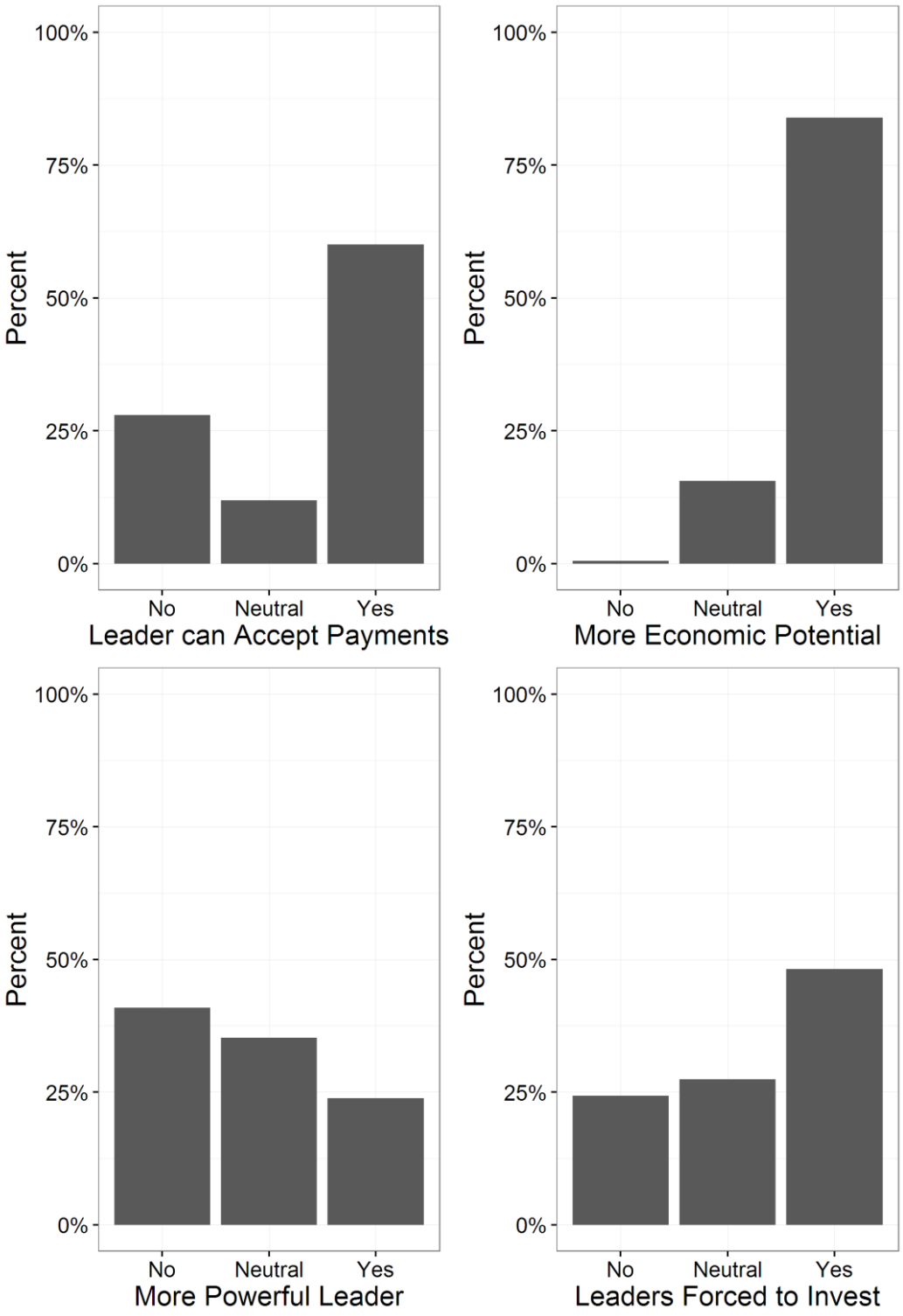
We gave participants a survey at the end of the experiment to see what kind of world they would prefer were they allowed to change the parameters. We assume that this is also the kind of world they would migrate to given the opportunity. Looking only at majorities where greater than 50% agreed on something, most people want to live in a world with:

A pool with institutional punishment, but where players can offer bribes and leaders can accept these bribes. Economic potential would be rich (unsurprisingly) and there would be transparency (players expressed strong preference for both transparency types).

There is some disagreement, but a small plurality of people would prefer to choose to contribute rather than be forced to contribute, and would prefer the leader to be less powerful and forced to invest in the public good.

Graphs





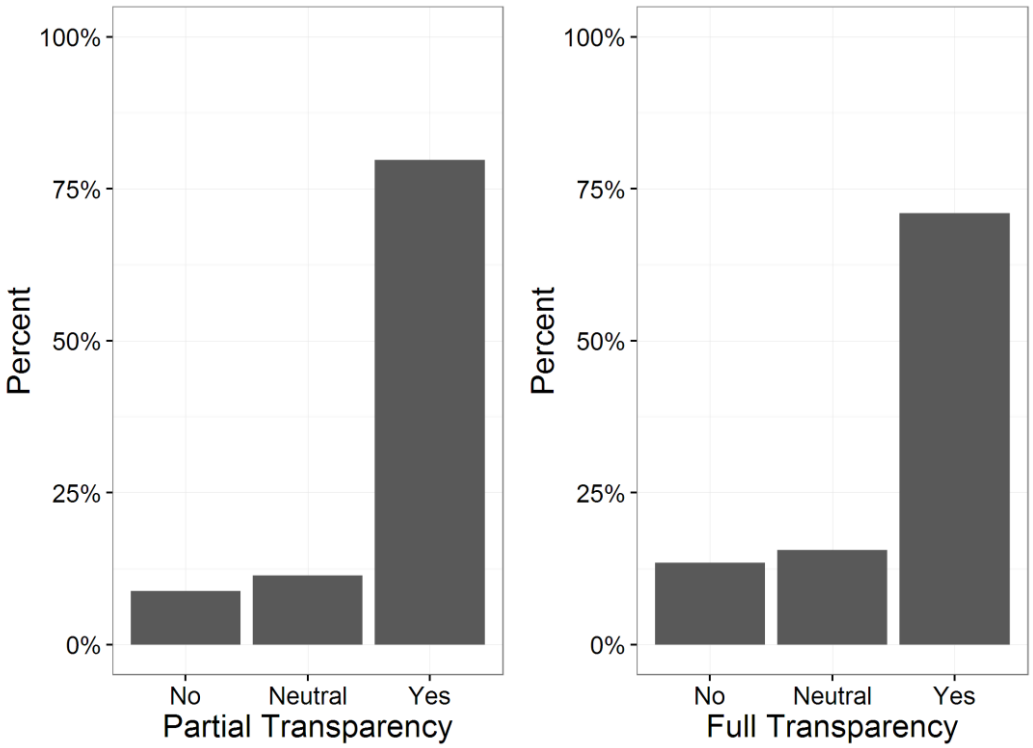


Figure S20. Distribution of answers for each end of survey question regarding preferences for the characteristics of the game.

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