Sample Results of the Asymmetric Public Goods Game

Sample results are shown in the table below, for a game with 30 students playing. They show some cooperative play in the first variation, but free-riding, in all or in large part, predominated; the students achieved a total payoff of 602, compared to possible payoffs of 720 with all tokens contributed to the group account and 540 with all tokens kept privately. In the second variation, a clear majority of students supported required contributions, and all students thus contributed all 6 tokens. In the third variation, 13 of the fortunate combined with 4 of the unfortunate to oppose mandatory contributions. The unfortunate, who are doomed to a low score even if they free-ride, contributed almost half their tokens, but the fortunate contributed nearly none, except for one (relatively) generous player who contributed half of her tokens. The total payout was 563 in this variation. In the fourth variation, the discussion among the students produced two proposals with substantial support, that the fortunate should get 2 shares and that they should get 5 shares, corresponding to divisions of (32,16) and (40,8). 2 shares is the integer number closest to the Rawls solution, while 5 is the libertarian solution. A narrow majority, composed mostly of unfortunate players, voted for 2 shares, and then a larger majority, though with substantial opposition from the fortunate, supported requiring contributions. In the fifth variation, where players do not know what their endowment will be, proposals were considerably more generous to the unfortunate. In this case, discussion among the students produced significant support for either 1 share or 2 shares for the fortunate, the former being the egalitarian solution, and a vote between these produced a majority in favor of 2 shares. The vote to require contributions produced a near-unanimous decision in favor, with the result of those who subsequently turned out to be fortunate getting a payoff of 32 while those who turned out unfortunate got 16.

***Variation 1
Known symmetric endowment, equal distribution of group return, no vote on required contribution***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Number of tokens: | *0* | *1* | *2* | *3* | *4* | *5* | *6* |
| Number of players contributing: | 8 | 7 | 6 | 3 |  | 2 | 4 |
| Their payoff | 26.27 | 23.27 | 20.27 | 17.27 |   | 11.27 | 8.27 |

Total contributions of 62 tokens to the group account produces a payoff of 62\*4/30 = 8.27 for each player; each player also receives a payoff of 3 for each token not contributed.

***Variation 2
Known symmetric endowment, equal distribution of group return, vote on required contribution***

|  |  |
| --- | --- |
| Votes in favor of requirement: | 23 |
| Votes opposed: | 7 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Number of tokens: | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| Number of players contributing: |  |  |  |  |  |  | 30 |
| Their payoff |  |  |  |  |  |  | 24 |

***Variation 3
Known asymmetric endowment, equal distribution of group return, vote on required contribution***

|  |  |  |
| --- | --- | --- |
|  | Fortunate | Unfortunate |
| Votes in favor of requirement: | 2 | 11 |
| Votes opposed: | 13 | 4 |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Fortunate* |  |  |  |  |  |  |  |  |  |  |  |
| Number of tokens: | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Number of players contributing: | 10 | 3 | 1 |   |   | 1 |   |   |   |   |   |
| Their payoff | 33.07 | 30.07 | 27.07 |   |   | 18.07 |   |   |   |   |   |
| *Unfortunate* |  |  |  |  |  |  |  |  |  |  |  |
| Number of tokens: | 0 | 1 | 2 |  |  |  |  |  |  |  |  |
| Number of players contributing: | 8 | 1 | 6 |  |  |  |  |  |  |  |  |
| Their payoff | 9.07 | 6.07 | 3.07 |  |  |  |  |  |  |  |  |

Total contributions of 23 tokens to the group account produces a payoff of 23\*4/30 = 3.07 for each player; each player also receives a payoff of 3 for each token not contributed.

***Variation 4
Known asymmetric endowment, vote on distribution of group return, vote on required contribution***

|  |  |  |
| --- | --- | --- |
| Proposed fortunate shares: | 2 | 5 |
| Fortunate votes for | 3 | 12 |
| Unfortunate votes for | 14 | 1 |
| Total votes | 17 | 13 |

|  |  |  |
| --- | --- | --- |
|  | Fortunate | Unfortunate |
| Votes in favor of requirement: | 10 | 14 |
| Votes opposed: | 5 | 1 |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Fortunate* |  |  |  |  |  |  |  |  |  |  |  |
| Number of tokens: | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Number of players contributing: |   |   |   |   |   |   |   |   |   |   | 15 |
| Their payoff |   |   |   |   |   |   |   |   |   |   | 32 |
| *Unfortunate* |  |  |  |  |  |  |  |  |  |  |  |
| Number of tokens: | 0 | 1 | 2 |  |  |  |  |  |  |  |  |
| Number of players contributing: |   |   | 15 |  |  |  |  |  |  |  |  |
| Their payoff |   |   | 16 |  |  |  |  |  |  |  |  |

***Variation 5
Unknown asymmetric endowment, vote on distribution of group return, vote on required contribution***

|  |  |  |
| --- | --- | --- |
| Proposed fortunate shares: | 1 | 2 |
| Total votes | 12 | 18 |

|  |  |
| --- | --- |
| Votes in favor of requirement: | 28 |
| Votes opposed: | 2 |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Fortunate* |  |  |  |  |  |  |  |  |  |  |  |
| Number of tokens: | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Number of players contributing: |   |   |   |   |   |   |   |   |   |   | 15 |
| Their payoff |   |   |   |   |   |   |   |   |   |   | 32 |
| *Unfortunate* |  |  |  |  |  |  |  |  |  |  |  |
| Number of tokens: | 0 | 1 | 2 |  |  |  |  |  |  |  |  |
| Number of players contributing: |   |   | 15 |  |  |  |  |  |  |  |  |
| Their payoff |   |   | 16 |  |  |  |  |  |  |  |  |