

## Public Goods Experiments: Other Applications and Issues

Susan K. Laury  
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## Experiments with Internal Nash Equilibria

- In the standard (linear) VCM the predictions are boundary solutions:
  - Individual Optimum: complete free riding
  - Social Optimum: contribute fully
- Any deviations (no matter the source) must be in the direction of over-provision relative to the Nash prediction.
  - What is viewed as altruism or cooperation may just be the path of contributions as they move toward the predicted level.

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- Changing the payoff structure can move the Nash prediction to the interior of the decision-space.
- This can be implemented by specifying earnings from either the private or public good as a nonlinear function of allocations.
  - I will focus on a public good with diminishing marginal return to contributions.
- If deviations from the boundary prediction were due to error, one should observe both over- and under-provision in this new environment.

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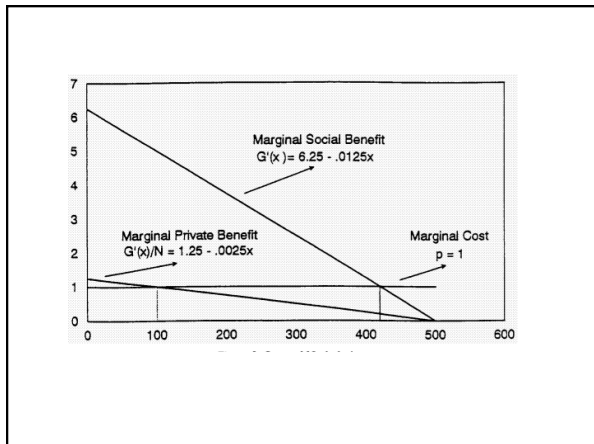
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**Isaac and Walker (Experimental Economics, 1998)**

- Subjects participated in groups of size 4, each with each with 62 tokens (248 tokens for the group).
- In all cases the Nash equilibrium is for an aggregate contribution
  - The individual contribution is not unique. Any sum of individual contributions that sums to the total is a Nash equilibrium
- Treatments: Nash = 0, 48, 124, 200 tokens

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- They also considered the role of information
  - In earlier experiments it was true, but not stated, that all subjects faced the same environment: number of tokens, return from the private good, and return from the public good.
  - In a complete information treatment this was explicitly stated.
- There was no significant effect of providing this information on contributions

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- Across groups and within a treatment there is a large amount of variation in aggregate contributions. Few aggregate contributions are consistent with the Nash prediction.
- Overall, average contributions in the Nash0 and Nash 48 treatments tend to be above the Nash predictions.
- Average contributions in the Nash124 and Nash200 treatments are below Nash
  - This is most apparent in the Nash200 treatment
- Contributions do not appear to converge toward the Nash prediction in Nash124 and Nash200

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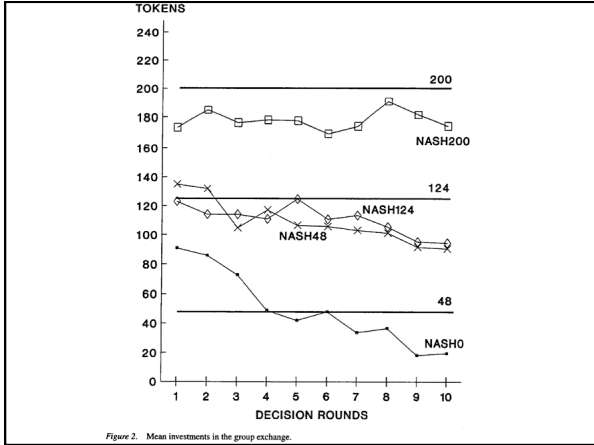
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**Laury, Walker, and Williams (Public Choice, 1999)**

- This paper extends the Isaac and Walker experiment.
- It looks at the effect of:
  - Changes in information about the payoff structure of the experiment
  - Resource endowment (number of tokens)
- Subjects participate in groups of size 5
- As before, there is a diminishing marginal return to contributions to the public good.

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- In all cases the unique (aggregate) Nash equilibrium was 100 tokens contributed to the public good.
- The social optimum was 420 tokens contributed to the public good.
- Individual endowments were either 125 or 200.
- Information about earnings was either provided in summary form or detailed.

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- ### Summary Information Treatment
- Written information provided in addition to the computerized information in previous experiments.
  - It emphasized:
    - Each token allocated to the private account earned 1-cent with certainty
    - Earnings from the group account depended on aggregate contributions
    - Each person in the group would receive an equal share of group earnings

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- ### Detailed Information Treatment
- All information from summary treatment
  - Additional information comparing the constant MC of allocating to the group account versus declining MB (to individual and group)
    - Table 1: additional return to a contribution to both individual and group at various levels
    - Table 2: Total group and individual earnings at various levels + additional earnings to both group and individual

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### Token Endowment

- The token endowment was changed, holding constant the Nash equilibrium and social optimum.
- While this doesn't change the prediction, some may be more apt to contribute if they have a higher resource endowment.

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### Results

- Contributions with low endowment and summary information are similar to the IW Nash48 treatment.
- The aggregate contribution is higher than predicted in all treatments.
- Contributions are lower in treatments with detailed information.
- With summary information, contributions are lower when the token endowment is lower.
  - It is only slightly lower in detailed info sessions

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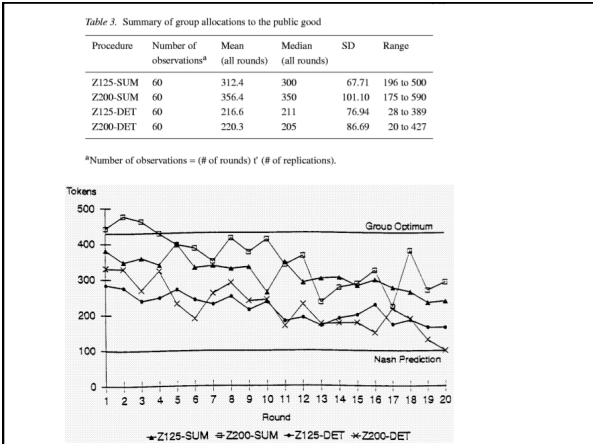
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