

Influence of Gender, Past, and Future on Cooperation in Non-Cooperative Games

A Vignette Study

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Contents

- 1 Problem Statement
- 2 Theoretical Background and Hypotheses
 - Repeated Games
 - Gender
- 3 Methodical Approach
 - Games in Focus
 - Vignette Analysis
- 4 Empirical Results
 - Prisoners' Dilemma
 - Trust Game
 - Ultimatum Game
- 5 Conclusion

Contents

- 1 Problem Statement
- 2 Theoretical Background and Hypotheses
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 - Gender
- 3 Methodical Approach
 - Games in Focus
 - Vignette Analysis
- 4 Empirical Results
 - Prisoners' Dilemma
 - Trust Game
 - Ultimatum Game
- 5 Conclusion

Problem Statement

- Is there any potential for cooperation in non-cooperative situations?
- Do
 - ▶ repeated interaction (iteration of a game) and
 - ▶ gender of the participants (players)influence decision making (the players' choices)?

Contents

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 - Gender
- 3 Methodical Approach
 - Games in Focus
 - Vignette Analysis
- 4 Empirical Results
 - Prisoners' Dilemma
 - Trust Game
 - Ultimatum Game
- 5 Conclusion

Game Theory and Repeated Games

- Basis: strategic (one-shot) games
- Reality offers the possibility of
 - ▶ Having met each other (played together) in the past
 - ▶ Interacting (playing) again in the future
- Additional examination of common past and future required
- Repetition of a game provides for
 - ▶ New strategies
 - ▶ Reward and punishment
 - ▶ Cooperation

Hypotheses (1)

- Games without past and future
 - ▶ One-shot games
 - ▶ Cooperation *not* expected
- Games with future
 - ▶ Finite play: Backward Induction
 - ▶ Cooperation *not* expected
 - ▶ Infinite play: Folk-Theorem
 - ▶ Cooperation expected
- Games with past
 - ▶ Information about other's strategies
 - ▶ Shared future crucial
 - ▶ Cooperation expected

Hypotheses (2)

- Games with past *and* future
 - ▶ Cooperation expected
- Intensity of repetition
 - ▶ Possibility of cooperation increases with increasing probability of repetition
- Importance of past vs. future
 - ▶ Influence of future is more fundamental

Influence of Gender

- Gender important in two ways
 - ▶ Respondent's sex (psychological aspect)
 - ▶ Opponent's sex (frame aspect)
- Previous experiments show no consistent findings
- Some experiments don't consider all players' sex

Socialisation Theory (Gilligan)

- Two morals:
 - ▶ Men follow justice orientation
 - ▶ Women follow care orientation
- Justice
 - ▶ Solutions found by deducing abstract rules
 - ▶ Self-centered way of considering problems
- Care
 - ▶ Individual solutions for individual problems
 - ▶ Think of others well-being

Social Role Theory (Eagly)

- Women and men hold different sex roles
 - ▶ Women are communal
 - ▶ Men are agentic
- Communal
 - ▶ Concern common welfare
 - ▶ Self-abandonment
- Agentic
 - ▶ Self-assertion
 - ▶ Controlling tendency
- Gender roles work in 2 ways
 - ▶ Knowledge of sex roles enforce stereotypical behavior
 - ▶ Sex roles allow prediction of other's behavior

Hypotheses

- Prisoners' Dilemma
 - ▶ Women cooperate more often than men
 - ▶ Rate of mutual cooperation is higher in mere female games than in mere male games
- Trust Game
 - ▶ Female trustors cooperate more often than male trustors
 - ▶ Female trustors are more trusted than male trustors
- Ultimatum Game
 - ▶ Women more often make a fair offer (50%) than men
 - ▶ Offers made by women are more often rejected than equal offers made by men

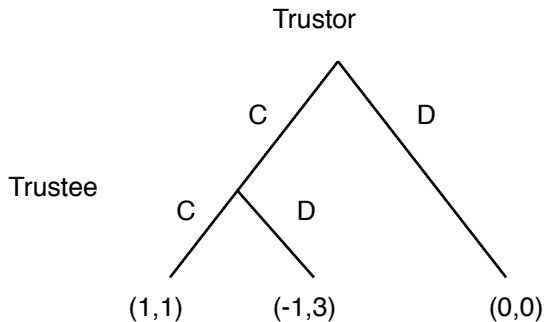
Contents

- 1 Problem Statement
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 - Games in Focus**
 - Vignette Analysis**
- 4 Empirical Results
 - Prisoners' Dilemma
 - Trust Game
 - Ultimatum Game
- 5 Conclusion

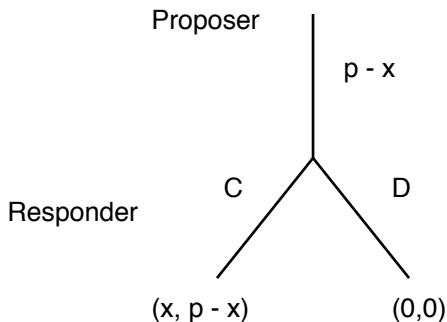
Prisoners' Dilemma

	cooperate	defect
cooperate	-1,-1	-5,0
defect	0,-5	-4,-4

Trust Game



Ultimatum Game



Vignette Analysis

- Vignette describes hypothetical situation
- Combined appearance of values is independent from empirical occurrence
- Influence of variables can be treated separately
- Quasi-experimental design
 - ▶ Randomizing vignette dimension improves internal validity
 - ▶ Using real situation improves external validity
- Subject selects one of a set of given actions (e.g., cooperation or defection)
- Dispute: measuring actions or norms?

Implementation

- Online survey
 - ▶ Facilitates randomization of vignette dimensions (independent variables)
 - ▶ Easy to reach a lot of people per email
- Vignette allocation
 - ▶ 7 to 15 Vignettes per person (free choice)
 - ▶ Random order
 - ▶ 1xPD, 2xTG, and 4xUG within the first seven vignettes
- Sampling modalities
 - ▶ Students
 - ▶ University of Cologne
 - ▶ January 7th to February 14th 2006
- Sampling problems
 - ▶ Self selection
 - ▶ No trusted information about respondents

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Descriptives

- Response
 - ▶ 555 respondents (about 500 after two weeks)
 - ▶ 5162 vignettes (modus: 8 vignettes per person)
 - ▶ Hardly any dropouts
- Respondents' demography
 - ▶ Age: mean 24 years (94% younger than 30 years)
 - ▶ Nearly all subjects (20% languages)
 - ▶ State: 92% Nordrhein-Westfalen
 - ▶ Gender: 33% men, 67% women

Prisoners' Dilemma

- 93% cooperation
- No significant influence of past, future and gender
- Significant influence of loss and gain ($p=0.006$)
- Possible explanation:
 - ▶ Student role dominates sex roles
 - ▶ Student standard (code of honor)
 - ▶ One-shot games and finite play not conceivable for the player

Trustor

- 79% cooperation
- Medial and intensive past significant ($p=0.001$)
- Intensive future significant ($p=0.03$)
- Opponent's sex almost significant ($p=0.08$)
- Significant influence of loss and gain ($p=0.000$)
- Interpretation:
 - ▶ Indicates strategic behavior
 - ▶ Acquaintances more trusted than strangers, independent of further repetition
 - ▶ Shared past more important than shared future
 - ▶ Women more trusted than men

Trustee

- 97% cooperation
- No significant influence of past, future and gender
- Explanation:
 - ▶ Social desirability
 - ▶ Self selection

Proposer

- Median offer 50%
- No significant influence of past and future
- No difference in mean offer of women and men, but women offer more often more than 50% than men
- Interpretation:
 - ▶ All effects are dominated by a fairness norm
 - ▶ Fairness compulsive for both sexes, but women are slightly more altruistic

Responder (1)

	40% offer	25% offer	10% offer
acceptance	73.1%	39.7%	30.4%
no past	72.2%	32.7%	32.3%
median past	71.3%	40.0%	28.9%
intensive past	77.0%	48.7%	31.4%
no future	69.5%	40.2%	29.9%
median future	69.1%	39.5%	31.6%
intensive future	79.2%	39.6%	29.5%
men	72.3%	36.8%	30.1%
women	73.4%	41.2%	30.5%

Responder (2)

- Acceptance rate increases with level of proposal
- Intensive past almost significant ($p=0.08$)
- No significant influence of future
- Interaction effect between actor's sex and opponent's sex ($p=0.05$)
- Significant influence of loss and gain ($p=0.001$)
- Interpretation:
 - ▶ Women's offers more likely to be accepted by men
 - ▶ Men's offers more likely to be accepted by women
 - ▶ "Unfair" offers made by acquaintances more likely to be accepted

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Conclusion

- Empirical results do not match theoretical prediction
- Common past is more important than common future
- Opponent's sex is more important than respondent's sex
- Differences between the sexes smaller than expected (by theory and by players)
- Vignette Analysis inadequate design?

Thank you for your attention!