Research Brief

Are Wives less Hawkish than their Husbands? Evidence from Hawk-Dove Game Field Experiments

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Abstract[1]

Lab-in-the-field Hawk-Dove game experiments were played by spouses in rural villages in Southern Ethiopia where women/wives traditionally have a weak position. Randomized treatments included a 3x3 design with simultaneous, one-way signaling and sequential games as the first dimension and Pareto-efficient, Pareto-inferior and Pareto-superior (Dove;Dove) payout treatments as the second dimension, with a sequence of six game rounds per household. The experiments allow for the assessment of the presence of alternative player types, such as players that prioritize household income maximization, players that prioritize personal income, players that are Hawkish and punish their spouse at their own expense, and cooperative reciprocators (Doves) who cooperate even at the expense of household and personal income. The experiments revealed that all player types were present in the sample. Husbands played significantly less Hawkish than their wives and played gradually less Hawkish over the six game rounds, whereas wives remained Hawkish throughout the session.

Introducton

Intra-household decisions may not be the outcome of cooperative bargaining. Non-cooperative bargaining models, such as the separable spheres model developed by Lundberg and Pollak (1993), may be better representations of intra-household cooperation and bargaining than cooperative bargaining (Manser and Brown 1980; McElroy and Horney 1981) and collective models of households (Chiappori 1988; 1992; 1997). One important distinction is that the latter models assume Pareto-efficient intra-household outcomes, whereas the former ones allow for Pareto-inefficient solutions within households.

The objective of this paper is to investigate the behavior of spouses towards each other in

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a sequence of six Hawk-Dove games where the benefits of mutual cooperation vary in simultaneous, one-way signaling, and sequential games. To our knowledge this is a novel contribution to the experimental literature on intra-household decision-making.

Figure 1. The Hawk-Dove game in the field.

These experiments allow us to assess which players are more Hawkish in the competition for funds within a household, whether players aim more for individual income maximization from the game or for household income maximization, and whether they are willing to punish their spouses at their own expense if he or she plays selfishly. We hypothesize that husbands, as the traditionally dominant individuals in this cultural setting, will be the more dominant and Hawkish player. Decisions in simultaneous games are made without knowing what the other player will

do, and expectations and uncertainty about what the other player will do is likely to affect the decisions. With one-way signaling games, such uncertainty is reduced, which should reduce errors in expectation formation. Additionally, with sequential games, such errors in the formation of expectations are fully removed. When there are individual incentives to be Hawkish, we vary the incentives for mutual cooperation. The (Dove, Dove)=(D;D) rewards are either Pareto-efficient, Pareto-superior or Pareto-inefficient compared to (Hawk, Dove) and (Dove, Hawk) pay-outs from a household perspective[2]. We hypothesize that (D;D) outcomes are more likely when they are Pareto-superior and less likely when they are Pareto-inferior relative to the Pareto-efficient case. Such a response requires that individuals are willing to sacrifice individual income to increase household income. The random combination of these treatments with simultaneous, signaling and sequential games allows us to identify the frequency of different 'player types' and 'household types' with respect to the degree of individual selfishness, intra-household cooperation and even willingness to punish the spouse at one's own expense. These are the unique contributions of our original design that also reveals interesting and surprising gender differences.

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[2] Pareto-efficiency is here seen as a situation where a redistribution of income among spouses cannot render one of the spouses better off without rendering the other spouse worse off. A (D,D) = (40,40) is Pareto-efficient in the sense that the sum of income (40+40=80) is the same as (H,D) and (D,H), with sums 60+20= 20+60=80. A (D,D) = (30,30) is Pareto-inferior because 30+30=60<80, and (D,D) = (50,50) is Pareto-superior to (H,D) and (D,H) because redistribution within the household can render both spouses better off.

Treatments

The Hawk-Dove experiment used a 3x3 randomized design of paired games where husbands and wives in a random order played each of the paired games. The first treatment category of paired games related to whether the game was 1a) simultaneous, 1b) a one-way signaling game or 1c) a sequential game. These treatments provide variation in the information about what the other player will do. The one-way signaling game strengthens the basis for expectation formation compared to the simultaneous game. The sequential game removes uncertainty about what the first player will do. However, the fact that all games are played in pairs means that one game is always followed by an identical "pay-back game".

The second treatment category was whether the (D;D) outcome of the game was 2a) Pareto-efficient, 2b) Pareto-inferior or 2c) Pareto-superior relative to the (H;D) and (D;H) outcomes.. These treatments create variation in incentives to cooperate in the game such that there is a trade-off in Matrix 3 between individual pay-out and household pay-out, creating a stronger social dilemma. Playing Hawk in Matrix 1 does not affect efficiency if the spouse plays Dove. If both spouses play Hawk, (H;H), this has a strong negative effect both on individual and household returns. The risk of (H;H) outcome should be reduced with one-way signaling games and sequential games. Matrix 2 reduces incentives to play Dove because (D;D) is Pareto-inferior.

Hypotheses

H1. Husbands behave more like hawks and women behave more like doves in the simultaneous HD game (selfish men hypothesis).

H2. In one-way signaling and sequential HD games, the first player will choose to play Hawk (selfish individual hypothesis).

H3. Both players are more likely to play Dove when the (D;D) outcome is Pareto-superior rather than when it is exactly Pareto-efficient, and when it is exactly Pareto-efficient rather than when it is Pareto-inefficient (household income maximization hypothesis).

H4. There is learning in the games such that the frequency of (H;H) outcomes declines through the games for those who aim to maximize household income, whereas more selfish individuals will move toward the optimal switch points in mixed games given the expectations of what the spouse will do based on earlier game rounds.

Testing for player types

We use the experiments to assess the extent to which the following types of players can be identified:

1) Persons that are willing to seek personal gain at the expense of the household gain: These are identified as persons who choose Hawk in games where (D,D) is Pareto-superior to (H,D) and (D,H) for the household.

2) Persons that are willing to seek personal gain at the expense of the spouse gain:
> These are identified as persons who play Hawk in Pareto-efficient (D,D) games

3) Hawks. Persons who are willing to punish their spouses at their own expense. These are persons who reduce inequality by reducing the pay-off to their spouse as well as to themselves (Charness and Rabin (2002). These persons can be identified as:
   a. Persons who always play Hawk.
   b. Persons who respond to Hawk with Hawk in sequential games.
   c. Persons who respond to Hawk with Hawk in one-way signaling games.

4) Doves (cooperative reciprocators). Persons who always cooperate even when doing so sacrifices household and personal income.

Summary of findings

The experiments revealed diverse player types, including players who prioritized household income over personal income (more common among husbands), players who maximized personal income at the expense of household income (more common among wives), players who always played Hawk (more common among wives), players who were willing to punish their spouses even if that meant sacrificing personal income, and players who always played Dove (cooperative reciprocators), even at the expense of household and personal income. There was a tendency for more aggressive players to render their spouses less aggressive such that only one of the spouses in a household played very Hawkish.

Overall, the results show that non-cooperative bargaining is common within households, resulting in Pareto-inefficient outcomes. The type of models that rely on Pareto-efficiency in the households cannot, therefore, be considered good universal approximations of household behavior. Our findings thus partially support the findings in recent experimental studies using the one-shot Voluntary Contribution Mechanism in intra-household public goods games with our more general Hawk-Dove game. Our Hawk-Dove game is a multiple equilibrium coordination game with varying Pareto-efficiency benefits from cooperation. The variation in communication in simultaneous games combined with sequential games with six rounds allowed for learning and expectation formation and revealed substantial variation of player types with surprising gender differences.

Full paper link:

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