

“Can People Detect Dilemma Strength in A 2 Player 2 Strategy Game?” : A Survey Game

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“Can People Detect Dilemma Strength in A 2 Player 2 Strategy Game?”: A Survey Game

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Abstract: *The objective of this study is to get data from the answers to calculate the dilemma strength for partners and strangers. A questionnaire field survey has been conducted on 28 individuals considering different games such as Prisoners Dilemma (PD), Trivial (TR), Chicken (CH) and Shag Hunt (SH) at Kyushu University, Japan. It is observed that the dilemma strength of Prisoners Dilemma is higher than Trivial. But on the other hand, the cooperation level of Chicken has been found better than that of Shag Hunt.*

Keywords: Dilemma strength; Cooperation; Defection; Game; Survey.

1. INTRODUCTION

2x2 game or 2-player 2-strategy game is one of the important paradigms for explaining our biological system. In case of 2x2 game, players are selected randomly and made to play the game where each player has 2-strategies: cooperation and defection [1]. However, if everybody defects, the mean population payoff is lower than if everybody cooperates, thus creating a social dilemma[2]. Von Neumann and Morgensteri’s statement on game theory that the game are classified into 4 classes; the Trivial game with no dilemma i.e. 100% cooperation, the Prisoner’s dilemma(PD) with entire dilemma means 100% defection, the Chicken (CH) game has coexistence of cooperation and defection members, the Shag Hunt (SH) game converge to either complete defection or complete cooperation depending upon the initial fraction of cooperators[3]. Thus, the objective of this study is to evaluate the dilemma strength of Friends and unknown with the base of this game theory.

2.RESEARCH MATERIALS & METHODOLOGY

To set forth the survey, questions are created by logical thinking to be as transparent as possible and so as not to be vexing for participants. There are 28 individuals participated at Kyushu University, Fukuoka, Japan who eligible persons in a sense are to answer the question paper. For each questionnaire, it comprises 8 questions and each question has multiple-choice answers which represented as 1 & 0 for the calculation of the result. Based on the responds from the fc (cooperation fraction), SD(standard deviation), Dg(dilemma strength), Dg/(normalized dilemma strength), $fc \pm SD$ (maximum or minimum value with the reference of fc and SD),the result is calculated.

3.RESULTS AND DISCUSSION

This segment represents the results from our survey. There is no consistency from the responses as a result no data is omitted. Results obtained from the survey are represented in figure 1,2,3 & 4 in which PD & TR game are played. Figure1 & 2 describe the interactions with 28 friends whereas figure 3 & 4 depict interactions with 28 unknown persons. In the case of friends, total average cooperation fraction for the PD & TR is successively

0.25(PD) & 0.85 (TR) but the natural characteristics of PD & TR game are 100% defection in PD but still have cooperation tendency where TR should have 100% cooperation but have some defection also. So, it can be said that, people are not able to recognize given dilemma strength exposed but they are able to recognize dilemma class. Most of the people can correctly recognize but some of the people are not. It is exposed that PD has high dilemma situation than TR game. Again From the figure 3 & 4, the total average cooperation fraction for the 28 unknown persons is 0.18(PD game) & 0.80(TR game) which represented that PD game has higher dilemma strength than TR game where noticing the fact people here being very generous, optimistic in PD and it can be said that defection is happened in trivial game also. For the case of friends and unknown persons the dilemma strength of PD is higher than SH.

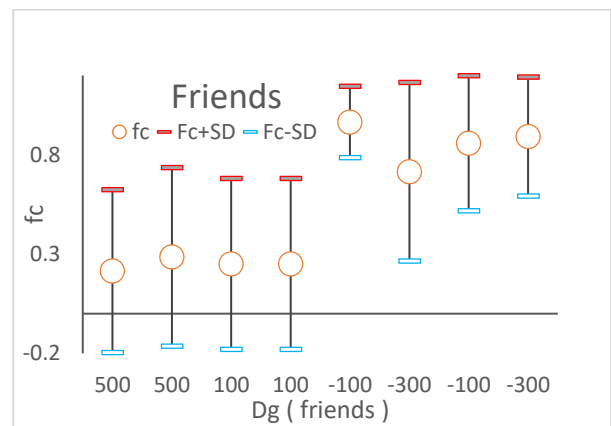


Fig.1: Game with 28 friends (PD & TR game) where Dg (dilemma strength) vs fc (cooperation fraction) is shown.

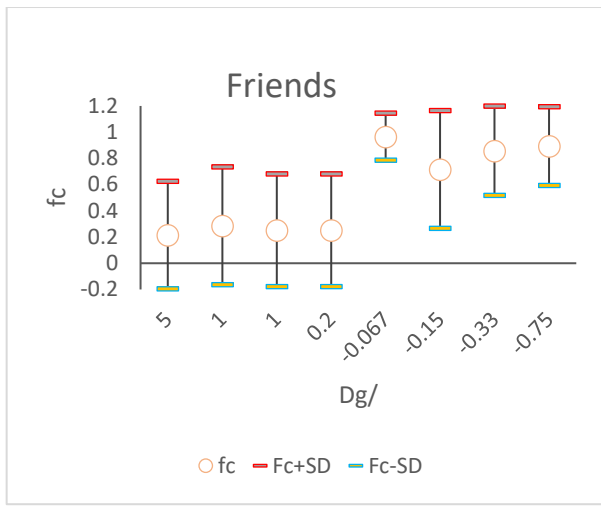


Fig.2: Game with 28 friends (PD & TR game) Where Dg/ (normalized dilemma strength) vs fc (cooperation fraction) is exhibited.

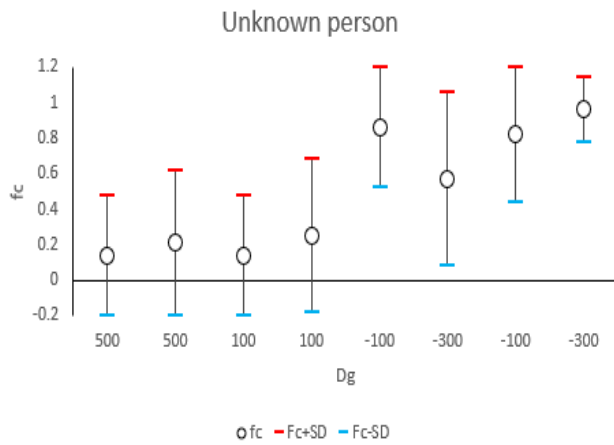


Fig. 3: Game with 28 unknown person (PD & TR game) where Dg (dilemma strength) vs fc (cooperation fraction) is shown.

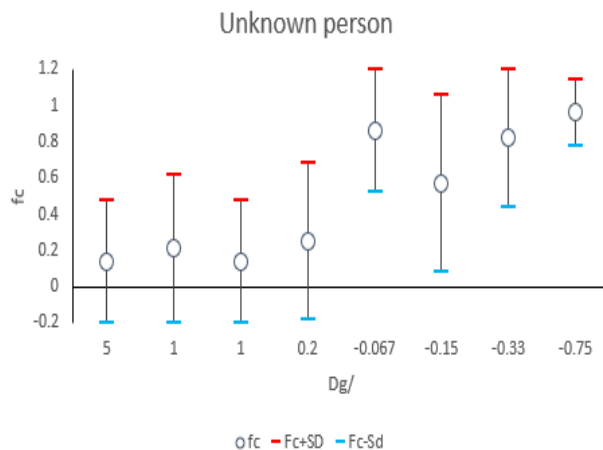


Fig. 4: Game with 28 unknown people (PD & TR game) where Dg/ (normalized dilemma strength) vs fc (cooperation fraction) is exhibited.

Playing with CH & SH, It is found that the total average cooperation fraction for the 28 friends is consecutively 0.59 (CH) and 0.54(SH) and again with 28 unknown people, is 0.65 (CH) and 0.61 (SH). Ideally the total cooperation fraction should be 0.5 but a little bit higher

for every case. Precisely speaking, it's not very close, a little bit higher cooperation in CH than SH.

4.CONCLUSION

To recognize dilemma class and dilemma strength, this survey represents that people can detect PD, Trivial, CH & SH game. PD has cooperative situation and Trivial has less defection level. In the same time, cooperation fraction of CH is higher than SH.

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