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Bilateral bargaining of heterogeneous groups—How significant are patient partners?☆

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ABSTRACT

Although many real bargaining situations involve more than one person on each side of the bargaining table, much of the theoretical and experimental research concentrates on two single players. We study a simple extension: bilateral bargaining of four people (two two-person groups) with different patience. One might think that the outcome should depend only on the most patient members of each group. The impatient members agree anyway and are, hence, irrelevant. We find, however, that the less patient player has at least some impact on the outcome. As an explanation we suggest a decrease in uncertainty about responder behaviour if a group is clearly asymmetric.

1. Introduction

Bargaining is prevalent in many areas of social interaction. Labour unions bargain with employers, political parties bargain with other political parties, families negotiate jointly with the seller of their new home, entire governments haggle with other governments about trade agreements, etc. These bargaining situations are non-trivial for two reasons: First, we know that already in very simple bargaining situations like the ultimatum game (Güth et al., 1982) but also in richer bargaining situations (Güth and Tietz, 1988) behaviour differs markedly from the game theoretic solution and behavioural motives matter a lot. Second, much of the bargaining literature models bargaining parties as individuals (see Osborne and Rubinstein, 1990, for a theoretical and Roth, 1995, for an experimental overview), although much of the real bargaining is done by groups. We know that groups can behave more competitively than individuals (see Wildschut et al., 2003; Wildschut and Insko, 2007, for an overview of evidence on the inter-individual – inter-group discontinuity effect). Thompson et al. (1996) argue that groups are more successful than solo negotiators. Chae and Moulin (2010) show axiomatically that group bargaining leads

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to different outcomes than individual bargaining. Evidence from individual bargainers can, thus, not easily be generalised to bargaining groups. Still, there are only few bargaining experiments where at least one bargaining party consists of more than one person.

Some of these studies are not essentially interested in groups but, rather pragmatically, use groups as a device to elicit spontaneous conversations which reveal motives and processes of bargaining individuals. Hennig-Schmidt et al. (2002) and Hennig-Schmidt and Li (2005) compare alternating offers bargaining of 3-person-teams in Germany to 3-person-teams bargaining in China. Geng and Hennig-Schmidt (2007) analyse communication and quasi-communication in 3-person-groups in ultimatum games. Hennig-Schmidt et al. (2008) analyse non-monotonic strategies of 3-person-groups in ultimatum games. These studies use homogeneous groups.

More related to our experiment is Messick et al. (1997) who study how individuals perceive processes within an opponent group. In their bargaining experiments groups have to use different decision rules. Messick et al. find that the solo counterparts of these groups do not anticipate the impact of the decision rules. As in Messick et al., we want to study how the bargaining position of a group is perceived by the group's opponents. In contrast to Messick et al. we keep the decision rule in groups constant and focus on the heterogeneity within groups.

While Messick et al. manipulate the processes within a group, Bornstein and Yaniv (1998) compare the behaviour of individuals with 3-person-groups in the ultimatum game. They observe that proposer groups make higher demands than individuals while acceptance rates are equal among groups and individuals and conclude that, hence, groups are more rational players than individuals.

Both experiments illustrate two major differences between individual and inter-group bargaining: Groups consist of several players with potentially heterogeneous interests and different power to influence the outcome. Furthermore, groups have identities which may be different from individual identities. In our experiment we will address these issues. We change the number of players who are just members of the group, the number of players who can affect the outcome and the heterogeneity of their preferences.

To simplify matters we exclude face-to-face interaction as well as within and between group discussions. Technically we extend Rubinstein's alternating offers bargaining game (see Rubinstein, 1982, 1985) to the simplest possible group case, namely to two two-person-groups.[1]

2. The bargaining game

2.1. Selfish individuals

In a Rubinstein bargaining game with complete information (see Rubinstein, 1982), two players divide a pie of size one. Players alternate in making offers how to divide the pie. If the responder accepts, the offer is implemented and the game ends. In each round without agreement, payoffs are discounted by individual factors $d_i \in (0, 1)$ for the two players $i \in \{1, 2\}$. In the subgame perfect equilibrium of this game, player 1 offers in the first round $(1 - d_2)/(1 - d_1 d_2)$ for herself and $1 - (1 - d_2)/(1 - d_1 d_2)$ for player 2. This offer will immediately be accepted by player 2.

2.2. Selfish groups

Demidova and La Mura (2010) extend this situation to three players: player 1, player 2A and player 2B with individual discount factors d_i ($i \in \{1, 2A, 2B\}$). Players 2A and 2B form a couple (or a two-person group).[2] Players have to split a pie of size one between player 1 and the couple. The members of the couple enjoy their share of the pie as a public good. As in the Rubinstein game parties alternate in making offers. Once a party accepts, the offer is implemented and the game ends. The couple decides unanimously. Offers are accepted only if both members accept. When both members of a couple make an offer, only the offer that is better for the couple counts. It is easy to show that the equilibrium of this game is equivalent to the equilibrium of a game where player 1 bargains with the more patient member of the couple. If, e.g. player 2A is less patient than player 2B ($d_{2A} < d_{2B}$), then in the subgame-perfect equilibrium player 1 will receive a share of $(1 - d_{2B})/(1 - d_1 d_{2B})$ and the couple will receive a share of $1 - (1 - d_{2B})/(1 - d_1 d_{2B})$. The preferences of the impatient player 2A do not matter at all.[3]

2.3. Groups with social preferences

We consider a variant of Demidova and La Mura (2010) with four players. Players 1A and 1B make the first proposal (only player 1A takes decisions, player 1B is passive and obtains the same payoff as player 1A), players 2A and 2B are the responders

[1] Demidova and La Mura (2010) analyse a situation where all group members are involved in each decision. Perry and Samuelson (1994), for instance, take another theoretical approach. They analyse a situation with two bargaining parties, one representing a (possibly large) constituency.

[2] Since using the word "group" for only two people might be problematic (see Harris et al., 2009), we will use the terms "two-person-group" or "couple" in the following.

[3] Demidova and La Mura (2010) extend these two situations to scenarios under one-sided incomplete information about time preferences which we will not consider in this paper.

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