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Groups in economics

Gillet, J.

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Citation for published version (APA):

Gillet, J. (2012). Groups in economics. Amsterdam: Thela Thesis.

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Chapter 1

Introduction: Groups in Economics

Economics is the social science that studies the allocation of scarce resources. This scarcity means that choices have to be made. These choices are made by individuals and these individuals – with their preferences and constraints and beliefs and expectations about other individuals etc. – are the main focus of standard economic analyses and theories. The role of groups in economic behavior is usually neglected. Yet, groups are an important and integral element of society and their existence affects the behavior of individuals (Akerlof & Kranton, 2000; van den Bergh & Gowdy, 2009; Hargreaves Heap & Zizzo, 2009). The work described in this thesis starts from the premise that a better understanding of the role of groups in economics will help us better understand economic behavior in general.

One can look at the role of groups in economic decision making at (at least) two different levels. First of all, many economic activities take place *within* groups. Decisions we make affect the people around us and their decisions may affect us. People often (try to) cooperate in groups. Competition also tends to take place in groups. Hence, there is social (group) aspect to many kinds of interaction, while interaction is at the core of economics. There is much previous work in both the theoretical and empirical literatures on this level of group decision making. For example, this is essentially at the core of game theory, which analyzes the ways in which people interact – cooperate, coordinate, compete – in (small) groups (for an overview see for instance Camerer 2003).

Secondly, many economic decisions are made *by* groups. For example, households decide what to consume and firms decide how much to invest. What characterizes these decisions is an interdependence within a group of both the decision to be made and the outcome to be reached. A single decision holds simultaneously for a (limited) number of people and the outcome of this decision affects all those in the group (although the costs and benefits of this decision are not necessarily evenly distributed across the group's members). It may be the case that all members of a group are involved in the process that determines the group decisions but this is not necessary (e.g., in case of leadership by one or more group members, non-leaders may not be included in the decision-making process). Of course,

groups interact with each other as well. Firms compete in markets. Governments try to cooperate or coordinate with each other.

There is far less previous work on the role of groups at this second level. One reason for this lack of interest may of course be that the nature of the decision maker (group or individual) generally does not matter in a theoretical analysis. By and large it holds that what is rational for an individual in a particular situation is also rational when a group faces the same situation. In a game theoretical analysis of a situation a particular outcome is a Nash equilibrium independent of whether the decision maker is an individual or a group (though this of course abstracts from the decision making in the group itself). Behaviorally things may be different. In fact, from the psychology literature we know that groups often act differently than individuals in the same situation. Nevertheless, in experimental economics the role of the decision maker in decisions that, in the real world, might be taken by a group is usually played by a single individual in the lab. Things may be changing, however. In recent years there has been an increasing number of studies in experimental economic that look at differences between individuals and groups (e.g., Cooper and Kagel 2005, Cox and Hayne 2006, Kocher and Sutter 2005, 2007, Sutter *et al.* 2009). In his book *Behavioral Game Theory*, Colin Camerer offers a concise review of the experimental literature on economic games, and lists the question whether groups play the economic games the same was as individuals do as one of the top ten open research questions (Camerer, 2003, p475).

Of course, the two approaches to the role of groups in economic decision making are not unrelated. What goes on within a group is likely to have an influence on the group's decisions. The reverse is also true: what happens to the group as a whole may well have an effect on how its members interact within the group.

Both approaches to studying the role of groups play a role in this thesis. The main research tool used is laboratory experiments. This allows us to study group processes in a controlled environment. This is especially useful in studying groups, as many factors that cannot readily be observed in groups outside of the laboratory play a role in group decisions: the history of the group, the way the members of the group interact with each other, communication, etc.. The laboratory allows us to create groups under specific conditions, without a previous history, and limit the group interaction to observable channels. This artificiality allows us to isolate specific group-related issues, study their effect on decision-making, and analyze the group decision-making process in detail. Of course, where useful –

e.g., for hypothesis forming or the discussion of results – we will also use theoretical insights.

This thesis thus describes a number of experiments aimed at investigating the role of groups in economic decision making. Different experiments have distinct between-group and within-group focus but they also cover the interconnectedness between the two approaches.

The focus of the experiments described in chapters 2 and 3 is primarily on identifying how decisions made by groups differ from decisions made by individuals. The results of the existing literature on this topic can, very roughly, be divided into two broad categories: groups make *better* choices and groups make *different* choices.

The first category can be summarized by the intuition that ‘two (or more) heads are better than one’. In fact, a major reason why many important decisions are made by groups is this idea that groups make better decisions. The expectation is presumably that by combining the different skills or bits of information that individual group members bring to the group, a group will typically outperform any individual decision maker. Moreover, the group deliberation process – the within-group discussion – may lead to insights that are out of reach to individual decision makers. For decisions with a demonstrably correct answer the argument is straightforward: assuming there is a proportion of the population that knows the answer, while the rest does not, then there is, statistically, a higher chance that one of n persons knows this answer than any randomly chosen individual. Empirical results show that groups are indeed better at finding a correct answer than individuals (Laughlin *et al*, 2003). According to Hill (1982) the superiority of groups with regards to problem solving – usually tested in the form of (crossword) puzzles, anagram tasks etc. – is the result of combining member resources and group members correcting each other’s errors. In an economic context the problem is, of course, that it is rarely clear what a correct choice is. In fact, for many economic questions it seems that there is no single ‘correct’ answer (e.g., because the optimal choice depends on preferences).

The second category describes the observation that people often behave differently when they are in a group than when they act alone. This covers not only the idea that a group’s choice depends on how the individual preferences of its members are combined but also that by being part of a group – through the interaction with fellow group members or simply by belonging to a particular group – the preferences of individual group members may shift. Moscovi and Zavalloni (1969) for example, show that if a number of people with more or less the same political preferences discuss politics, the group consensus tends to

become more extreme than the average of the individual opinions. From an economist's perspective, an important finding in this respect is that groups often tend to be more competitive than individuals. This effect has been found repeatedly in experiments with prisoners' dilemma games (see Schopler & Insko 1992 for an overview) where groups choose the non-cooperative option more often than individuals.

Of course, playing the competitive option in a prisoners' dilemma is – in game theoretic terms – also a dominant strategy. It therefore cannot unambiguously be interpreted as being more competitive. It could also mean that groups have a better understanding of the game and choose in a more rational way. The experiment described in chapter 2 was deliberately constructed to be able to distinguish between these two interpretations. We compare individual- and group decisions in an inter-temporal common pool situation. With the decision-maker, in a way, in the role of a fisherman who has to decide how many fish to catch while taking the consequences of this action on the future number of fish in the pool into account. Thanks to a two-part design we show, firstly, that groups are better at solving the inter-temporal puzzle of the common pool situation but, secondly, that this advantage disappears in a strategic setting. We are able to attribute this latter result to a higher competitiveness of groups, compared to individual decision makers. Analysis of the within-group decision making process shows that the increased competitiveness is the result of a combination of participants being slightly more competitive when they are part of a group and the median voter becoming more competitive as a result of the group decision making process. We also find that groups deciding by majority are more competitive than individuals from the start whereas groups having to decide unanimously only become more competitive over time.

The decision making *process* plays an even more important role in the second experiment, described in chapter 3. The main motivation here is that in an industrial organization context the different managerial styles that companies can use to reach decisions may influence the outcome of these decisions. In a Bertrand pricing game with the opportunity to form (non-binding but costly) price-agreements we compare individual decisions with groups having to decide unanimously, groups deciding by majority rule and groups where one (randomly appointed) member decides on behalf of the group. Here we fail to find a difference between individuals and groups in general with regards to competitiveness (measured in the number of price agreements and the prices chosen). But we do find remarkable differences across group decision-making procedures. The most

noticeable result is that groups with a single-member decision – the groups with a leader – choose higher prices.

This last result introduces the concept of leadership into the thesis, which is further investigated in the third experiment. Leadership can take different forms and can have different effects. The experiment described in chapter 4 considers leadership-by-example. In a coordination game we compare situations where groups decide simultaneously to groups where one of the members decides, publicly, before the rest. Having one member choose before the rest should not have an effect on the coordination problem but we show that it does have a positive effect and helps the group coordinate on better outcomes. It does not seem to matter whether the leader leads voluntarily or is randomly appointed.

All in all, the aim of this thesis is to advance our understanding of the influence of between- and within-group processes in economic decision-making. Our results help disentangle the differences between groups and individuals in competitive situations and shine new light on the role of the decision making process herein. We further show how leadership can help overcome within-group coordination problems. More generally we hope to show the importance of the interlinkage of intra- and inter-group processes in understanding group behavior in economics.