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On the effects of group identity in strategic environments

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ABSTRACT

We examine differences in behavior between subjects interacting with a member of either the same or different identity group in both a centipede game and a series of stag hunt games. We find evidence that subjects interacting with outgroup members are more likely to behave as though best-responding to uniform randomization of the partner. We conclude that group identity not only affects player's social preferences, as identified in earlier research, but also affects the decision making process, independent of changes in the utility function.

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1. Introduction

It is well established that group identity manipulations can increase altruism, positive reciprocity and the desire for maximising social welfare among ingroup partners, even when group assignment is based on arbitrary criteria (for an overview, see Chen and Li, 2009; Chen and Chen, 2011; Goette et al., 2012a,b). In this paper, we consider the possibility that group identity affects not only preferences, but also affects a player's decision making through the underlying belief-formation process or belief-action correspondence. This idea shares some relationship with the concept of social projection in psychology (Robbins and Krueger, 2005; Acevedo and Krueger, 2005; Ames et al., 2011), but has not received attention in the economics literature.

We report the results of two separate experiments which reveal that people interacting with outgroup partners in strategic interactions are, ceteris paribus, more likely to behave as though their opponent is behaving randomly. We show that this effect can augment, diminish, or even reverse the impact of group identity on social preferences, and in the latter case can result in counter-intuitive outcomes, for example, outcomes contrary to predictions of standard preference-driven models of group identity.

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Our first experiment was originally designed to examine the impact of social preferences on behavior in the centipede game. Participants were assigned to almost "minimal groups" according to their preferences over paintings (following Chen and Li, 2009) and interacted with ingroup or outgroup members. Following the social-preference hypothesis, our prior was that increased altruism, positive reciprocity and the desire for maximising social welfare would lead to pairs from the same identity group to continue longer and reach more efficient outcomes. However, we found that the opposite was the case, with pairs from different groups (outgroups) continuing longer. The explanation we found for this counter-intuitive result was that subjects were more likely to act as though the behavior of outgroup members was random, compared to behavior when facing ingroup members. This could occur either because subjects form different beliefs about the strategic sophistication of outgroup members or feel less able to predict their behavior. With the exponentially-increasing payoffs in the centipede game, the best response to uniform randomization of the opponent is to choose continue.

We implemented a follow-up experiment (Experiment 2), applying the same group identity manipulation in a series of extended stag hunt games, to further test the explanations of behavior suggested by the results in the centipede game (Experiment 1). Experiment 2 allowed us to test our explanation independently using new data, and importantly, without relying on stated beliefs of participants. Confirming our initial results, we again found that subjects interacting with outgroup members were more likely than those interacting with ingroup members to choose strategies which were best responses to uniform randomization (BRUR) by their partner.

Results across the two experiments point at two intuitive interpretations for why subjects behave as if outgroup members are treated as acting randomly. In the first, outgroups are seen as being genuinely strategically unsophisticated in comparison with ingroup members, thus raising an individuals' self-esteem. Alternatively, subjects may feel less able to predict outgroup behavior and, having no idea about what they will do, apply the principle of insufficient reason and assign equal probability to all possible actions.

As an additional test of our findings, we elicited participants' beliefs about the behavior of their opponents in both experiments and found differences in the treatment effects across experiments. In Experiment 1, we found no treatment effect between elicited beliefs but support for changes in the belief-action correspondence between group affiliation treatments. In Experiment 2, there was a significant treatment effect, suggesting that the group identity manipulation also affected the belief-formation process itself. These conflicting findings suggest that our belief data is not sufficiently reliable to distinguish between the interpretations described in the previous paragraph, but add to the emerging discussions on biases in belief elicitation (e.g. Schlag et al., 2014; Schotter and Trevino, 2014) and on the underlying relationship between (ex post) stated beliefs and behavior in strategic interactions (e.g. Costa-Gomes and Weizsäcker, 2008; Rubinstein and Salant, 2014).

Overall, our insights contribute to the understanding of the effects of group identity in strategic interactions, and more specifically, fully explain a number of puzzling empirical and experimental observations in bargaining and market environments. Graddy (1995), for example, showed that white fishmongers charge less to Asian customers (in take it or leave it offers); Ayres (1991) found that test buyers get worse deals from car salespeople of same gender or race. A recent experimental study closely related to our work is Li et al. (2011) who also use group identity manipulations to study seller–buyer relationships in oligopolistic markets. Their results show that sellers charge lower prices to buyers of the other group than of the same group and is consistent with our results of an uncertainty-driven discrimination if salespeople are less certain about the relevant outgroups' bargaining strategy than that of ingroups. Increased uncertainty regarding outgroup behavior also provides an explanation of why employers are often less willing to hire people of different gender or ethnic groups, even in the absence of any preference for discrimination.

2. Experiment 1: centipede game

The study was designed to investigate the role of social preferences in behavior in the centipede game.[1] To this end, we used a seven-legged centipede game with exponentially-increasing payoffs, as depicted in Fig. 1. In this game, two players (labelled neutrally as player types 1 and 2 respectively) alternately faced the decision to continue or stop, $a \in \{C, S\}$, until one of them chooses stop, which ends the game, or player 2 chooses C at the final node. The unique subgame-perfect Nash equilibrium is such that players choose to stop at each of their decision nodes, the game thus ending at the first node.

If group identity increases reciprocity, a natural hypothesis is that subjects playing with an ingroup member are more likely to continue at any given decision node compared to subjects interacting with an outgroup member. Theoretically, increased altruism and concerns for social-welfare maximization would make players continue longer by making later

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[1] The centipede game has attracted much attention both in the theoretical and experimental game theory literature. It has been repeatedly demonstrated in experimental studies that the game is rarely terminated at the first node, the unique subgame-perfect Nash equilibrium in the game. Most of the literature has argued that the systematic deviations from the subgame-perfect equilibrium outcome result from some form of bounded rationality (Rosenthal, 1981; Aumann, 1995, 1998). Boundedly rational explanations of behavior in the experimental literature on the centipede game include quantal response equilibria (Fey et al., 1996; McKelvey and Palfrey, 1998), learning (Nagel and Tang, 1998; Rapoport et al., 2003), varying abilities to perform backward induction or limited depths of reasoning (Palacios-Huerta and Volij, 2009; Levitt et al., 2011; Gerber and Wichardt, 2010; Kawagoe and Takizawa, 2012; Ho and Su, 2013). With the exception of McKelvey and Palfrey (1992) and Fey et al. (1996), who allow for altruistic behavior, none of these papers has explicitly tested for the possible import of social preferences in the centipede game.