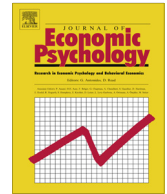




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Group payoffs as public signals

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ABSTRACT

We study experimentally the effect on individual behavior of comparative, but payoff-irrelevant, information in a near-minimal group setting. Specifically, in each round, group members see the groups' cumulative payoffs, which consist of an aggregation of the earnings of each member of the group in the round. Our novel experimental design incorporates two games (the Trust game and the Dictator game) whose payoffs are carefully chosen to ensure cross-game comparability. In the baseline, no comparative information is displayed; the sessions are otherwise identical.

Our first set of results shows that the display is sufficient to induce an in-group bias, which can neither be attributed to mere categorization of subjects into groups nor to a stronger sense of group identity as a result of the display. Moreover, we corroborate existing results, which find that, relative to the baseline, the display is welfare reducing in the Trust game. Our second set of results shows that when comparing the allocators' decisions across the two games, a first mover's trust is reciprocated by the second mover independently of group identity.

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1. Introduction

Recent experimental literature has shown that information on groups' performance promotes intergroup competition, which, in turn, induces improved group cooperation (e.g. Bornstein, Erev, & Rosen, 1990; Erev, Bornstein, & Galili, 1993; Erev & Bornstein, 1994; Nalbantian & Schotter, 1997; Bornstein, Gneezy, & Nagel, 2002; Eckel & Grossman, 2005). This research has been noticeably restricted to payment schemes where group members' payoffs are contingent on the group's performance relative to that of the other group(s). In light of the relatively recent (but not group-based) literature on the impact of social comparison on decision making,¹ it is, thus, not clear whether the improved group cooperation is an outcome of the payoff consequences or the comparative information provided.

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¹ Studies differ in the type of social information selected and presented to participants. Several studies present the decisions of other participants (e.g. Cason & Mui, 1998; Duffy & Feltovich, 1999; Eckel & Wilson, 2007; Krupka & Weber, 2009; Shang & Croson, 2009). Some studies present a statistic on the participants' offer/contribution/rating (Bohnet & Zeckhauser, 2004; Frey & Meier, 2004; Chen, Harper, Konstan, & Li, 2010). Finally, another set of studies presents the complete ranking of all participants (e.g. Duffy & Kornienko, 2010).

Our primary objective in this study is to determine experimentally the effect on individual behavior of comparative, but payoff-irrelevant, information in a near-minimal group setting.² More specifically, we investigate whether the display of comparative information is sufficient to invoke behavioral differences across in-group and out-group members. We, also, examine the implications of the display on participants' group attachment and welfare. To determine the effect of the display *per se*, we establish a baseline where no comparative information is displayed; this enables us to, also, test whether, as Social Identity Theory postulates, mere categorization of subjects into groups is sufficient to lead to behavioral differences across in-group and out-group members (Tajfel & Turner, 1986).³ An additional virtue of our framework is that it utilizes two games (the Trust game and the Dictator game), which allow us to determine the sensitivity of our main hypothesis to the nature of the game. Crucially, the payoffs are identical for the specific choices made across the two games (see, SubSection 2.2 for more details); otherwise, a change in behavior could be attributed to a change in the monetary incentives. Thus, a secondary objective in this study is to investigate any behavioral differences when the *allocator* (the second mover in the Trust game or the dictator in the Dictator game) decides on the split.⁴ To the best of our knowledge, this is the first study to address the role of trust and reciprocity in a group setting via cross-game comparisons.

Our experimental design consists of three stages. In the first stage, participants are divided equally into two groups on the basis of a trivial criterion. In the second stage, participants play either the Dictator game or the Trust game.⁵ In the last stage, participants complete a questionnaire, which consists of explicit statements to measure their group attachment and some questions of demographic nature. An important design decision is the type of social information provided in the experiment. Based on the findings in other studies and our choice of games, we choose to display the groups' cumulative payoffs in the round; the latter consist of an aggregation of the earnings of each member of the group in the round (henceforth, for brevity, referred to as *group payoffs* unless there is a risk of confusion).⁶ It is important to note that our design is symmetric in that groups' payoffs consist of an equal number of subjects with equivalent roles round after round; that is, there are as many second movers/dictators in one group as there are in the other group in any given round. Crucially, the display of group payoffs has no effect on agents' earnings, but provides information on other players' behavior albeit in different ways. In the Dictator game, an endowment \bar{x} to be allocated by a dictator to an in-group member will increase the group's payoffs by \bar{x} regardless of the allocation; thus, no information is revealed on the generosity between in-group members. However, when a dictator allocates an amount to an out-group member, then, information is revealed on the generosity to out-group members as the payoffs of both groups are affected. Conversely, the display of group payoffs in the Trust game provides information on, both, the generosity between in-group members and the generosity to out-group members. On one hand, larger generosity of first movers to in-group second movers unambiguously increases the payoff of the group because of the multiplier on the initial transfer. The decision of the second mover, in this case, is of no consequence to the group's payoffs. On the other hand, any generosity to out-group first movers unambiguously reduces the group's payoffs.

Our first set of results demonstrates that the display of group payoffs is sufficient to invoke an in-group bias in both games (i.e. a link between the group members' payoffs and the group's behavior relative to that of the other group is not a necessary condition for an in-group bias). We say there is an *in-group bias* if the payoff of an allocator who is matched with an out-group member is significantly different (larger) than the allocator's payoff when matched with an in-group member. We investigate why the display of group payoffs has this effect on behavior. We find that the in-group bias can neither be attributed to mere categorization of subjects into groups nor to a stronger sense of group identity as a result of the display. We propose instead that the display of group payoffs acts as a public signal that makes groups salient, and this, in turn, produces the in-group bias; however, we defer testing this conjecture for future research. Moreover, motivated by the study of Hargreaves Zizzo (2009), we investigate the welfare implications of the display of group payoffs in the Trust game.⁷ In contrast to our study, Hargreaves Zizzo (2009) provide subjects with explicit information on the average giving rates and average return rates of in-group and out-group members. Relative to a baseline without group assignment, they find that "the existence of groups . . . tangibly reduces trust in the aggregate, and thus is welfare reducing" (p. 297). Similar to the aforementioned study, we, also, find that, relative to the baseline, total welfare goes down when group payoffs are displayed: first movers transfer significantly less to out-group second movers and do not transfer significantly more to in-group second movers.

Our second set of results comes from conducting cross-game comparisons to determine any behavioral differences when the allocator decides on the split. Existing literature (see, for instance, Berg, Dickhaut, & McCabe, 1995) demonstrates that

² A *near-minimal* group setting is one with (a) a trivial group assignment, (b) no social interaction, and (c) anonymity. Groups are considered minimal if, in addition to these three conditions, the condition that there is no trade-off between the decision-maker's payoff and others' payoffs is also satisfied.

³ The Social Identity Theory argues that individuals have a desire for positive self-identity. This positive image may derive, in part, from one's own qualities, but, also, from membership to one's group. In this latter case, a positive image of the group induces a positive image of the individual member. Esteem for one's group may be positive or negative depending on how well the in-group members compare to relevant out-groups. Thus, in-group members gain if the comparison with other groups is more favorable because their self-image improves.

⁴ The role of the dictator in the Dictator game and the second mover in the Trust game are somewhat similar in the sense that they are the ones to allocate the final payoffs. Although, as an anonymous referee points out, the two decisions clearly differ for the possible reciprocation in one and not in the other.

⁵ A value added of using the Trust game is its connection to the work on social capital. However, in sharp contrast to the studies, mostly, on the Public Goods game that investigate behavioral changes in a setting with a single group, here, we report decisions in a setting with two groups.

⁶ The type of information provided is a rather subtle issue in the sense that it could make an outcome focal. A large body of literature in social psychology (some cited above) shows that social comparisons affect behavior since individuals gain information on what constitutes the 'right behavior' in various contexts. We believe that the display of groups' payoffs relative to another statistic, such as an average or a median, provides some pertinent information on group behavior, without making an outcome prominent.

⁷ The Dictator game is not suitable for welfare analysis as the total number of quarters in the game play is fixed *ex ante* by the experimenter.

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