# Identity, Leadership, and Cooperation: An experimental analysis \*

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#### Abstract

Effective leaders promote cooperation among their followers. Although many studies have focused on approaches to effective leadership, few have studied how social identity —both the leader's and the group's impacts a leader's effectiveness. We use a theoretical framework and a novel laboratory experimental design to report data from leader-follower games. In the game, the leader may or may not share a social identity with the rest of the group. Our main finding is that ingroup leaders are more effective than outgroup leaders. In particular, ingroup leaders are more likely to suggest greater cooperation among followers, and their suggestions are more likely to be followed. Furthermore, we find that ex-ante outgroup leaders are perceived to be less cooperative. These findings provide evidence of an important challenge to achieving the well-documented organizational benefits that stem from a diverse and inclusive workplace.

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## 1 Introduction

Leadership is fundamental in helping resolve collective action problems in social groups. A leader's ability to influence her social group measures her leadership effectiveness (Van Knippenberg, 2011). However, a leader's influence can limit the group if the leader does not represent shared group norms, values, goals, and ideals. Group identity being defined by group norms<sup>1</sup> (Akerlof and Kranton, 2000) is a leading cause of intergroup bias (Fershtman and Gneezy, 2001; Chen and Li, 2009; Hargreaves Heap and Zizzo, 2009) and can lead to prejudice against outgroup leaders. There is little evidence in the literature on how sharing group identity between a leader and a social group can affect leader effectiveness. To fill this gap, we develop a model and a novel experimental design and study how leader-follower interactions differ under ingroup and outgroup leadership.

While referring to leadership, there is an implicit reference to an associated group: the nation, the political party, the organization, the research group, and so on.<sup>2</sup>. However, little is known about disparities between cooperation with ingroup and outgroup leaders even when they are otherwise identical. Our study focuses on a social dilemma setting where group performance is dependent on the leader's effort<sup>3</sup>. A leader's ability to be effective depends on whether she can foster cooperation

<sup>&</sup>lt;sup>1</sup>Shared group norms or a common identity have a positive impact on cooperation (Eckel and Grossman, 2005; Goette et al., 2006; Chakravarty et al., 2019), coordination, (Charness et al., 2007; Chen and Chen, 2011) and team building (Pan and Houser, 2013; Charness et al., 2014) among group members. Cooperation, coordination, and team building are defining aspects of leadership. (Bolton et al., 2010)

<sup>&</sup>lt;sup>2</sup>The leadership literature and, more recently, the economics literature have focused on the dynamic interaction between leaders, and a social group as an important determinant of leadership effectiveness (Judge et al., 2002; Van Knippenberg and Hogg, 2003; Haslam, 2004; Brandts et al., 2015; d'Adda et al., 2017; Zehnder et al., 2017; Steffens et al., 2020) The economics literature has primarily studied leadership effectiveness by focusing on (i) transactional leadership styles tied to providing incentives, rewards, or punishments (Brandts et al., 2015; Fehr and Gächter, 2002; Güth et al., 2007) or (ii) transformational leadership styles associated with leading-by-example (Hermalin, 1998; Komai et al., 2007; Potters et al., 2007).

<sup>&</sup>lt;sup>3</sup>Grossman et al. (2019) find that in a setting where a leader's effort does not affect group success or failure,

in her group<sup>4</sup>. In particular, an effective leader will encourage higher levels of cooperation and convince her followers to match her cooperation signals. This will lead to higher group cooperation and social welfare. In our model, similar to (Levy et al., 2011; Houser et al., 2014), randomly-selected leaders send a cheap-talk signal suggesting an amount that each person in the group can contribute (including leaders) in a standard voluntary contribution game. Following the conditional cooperation literature (Croson, 2007; Gächter et al., 2012), we assume followers prefer to match the leader's contribution suggestion.

In addition, following the social identity theory of leadership effectiveness (Tajfel and Turner, 1982; Van Knippenberg and Hogg, 2003), we assume that followers believe that ingroup leaders pursue the group's best interest as they perceive them to embody the group norms. In particular, the social identity theory suggests that leaders are more effective at motivating and influencing followers who perceive them as prototypical<sup>5</sup> of the group. In line with that, we hypothesize that followers are more inclined to trust ingroup leaders who are perceived to be prototypes. Followers will derive higher utility by cooperating with ingroup leaders and thus will want to match their contribution suggestions. Thus, our model predicts that groups will cooperate more under ingroup leadership making them more effective leaders. Further, since all followers receive the same cheap-women leaders are assessed negatively than equally effective men.

<sup>5</sup>The theoretical explanation is that the ingroup prototype leader is an abstract representation of "us" that maximizes inter-group differences ("us" vs. "them") and ingroup similarity. A large body of research in social psychology provides evidence consistent with these claims, e.g., Steffens et al. (2020), which show the impact of very high leader pay on followers' ability to identify with the leader. Zehnder et al. (2017) observe how organizations can cultivate identification among their members through effective leadership.

<sup>&</sup>lt;sup>4</sup>In natural settings, the role of a leader may encompass a broad range of activities — coordinating individual tasks, mediating conflicts, punishing deviators, and so on. Van Vugt and De Cremer (2002) provide a social psychological perspective on aspects of leadership in social dilemma situations. In this paper, we focus exclusively on a leader's role in fostering cooperation in groups.

talk signal, it acts as a focal point of contribution convergence (Levy et al., 2011; Houser et al., 2014; Gangadharan et al., 2016, 2019). Our model predicts that ingroup leaders will send a higher cheap-talk signal to encourage their followers to cooperate  $^{6}$ .

We test our model's predictions using a novel laboratory experiment in which subjects are randomly assigned into four-person groups. First, we used a two-fold identification strategy to induce artificial group identities. Using a "minimal group paradigm" design<sup>7</sup>, we assign labels to groups, then further enhance group identity through a collective puzzle - solving task. Following this, a public goods game is played in three treatments. In the baseline treatment, groups with induced identities play the public goods game without a leader. In the subsequent two treatments, we introduce leaders. Our leaders have no unique information; all relevant information is equally available to their followers. The only factor distinguishing our leaders from their followers is that they occupy the "leadership" position. In one treatment, leaders have the same group identity as followers; in the other treatment, leaders and followers have different identities. In all cases, the role of the leader is to send a cheap-talk signal to all the group members, after which the leader and the followers simultaneously decide their contribution amounts. We further elicit beliefs regarding leader contributions at the beginning of the public goods game. Given that the treatments differ only in whether a leader shares the same identity as the followers, we can isolate the effect of shared identity on effective leadership. By randomly assigning leaders in a controlled laboratory experiment, we avoid the selection and endogeneity problems that often arise in the field.

<sup>&</sup>lt;sup>6</sup>Previous literature has found that when followers consider an outgroup leader to be an "illegitimate leader", they are more likely to ignore the signals of outgroup leaders. Ridgeway et al. (1994); Ridgeway (2001); Grossman et al. (2019) found that followers ignore signals from female leaders because female leaders are viewed as illegitimate.

<sup>&</sup>lt;sup>7</sup>Minimal Group Paradigm (Tajfel et al., 1971) is a widely used experimental technique for studying intergroup perceptions and behavior. Tajfel et al. (1971) use experiments to assign participants to one of two meaningless categories and ask them to allocate rewards to other (anonymous) members of those groups. Typically, discrimination in favor of the ingroup is observed in those reward allocations.

The first contribution of our paper is bringing together two different strands of literature the role of leaders in fostering cooperation (Potters et al., 2007; Chaudhuri, 2011; Sahin et al., 2015) and the role of social identity in enhancing cooperation (Eckel and Grossman, 2005; Goette et al., 2006; Charness et al., 2007; Chen and Li, 2009; Chen and Chen, 2011; Pan and Houser, 2013). To the best of our knowledge, only Drouvelis and Nosenzo (2013) and Ibanez and Schaffland (2018) have so far studied the effect of group identity on leadership but use different leadership institutions than us. In contrast to Ibanez and Schaffland (2018), we consider a set-up where the leader has similar strategic gains from higher performance as followers. Such social dilemma situations are common in organizational settings where a leader not only has to resolve conflicts but actively participates in promoting social interest.<sup>8</sup> Instead of leading-by-example, as in Drouvelis and Nosenzo (2013), leaders use pre-play communication to enhance cooperation in our experiment. Ensuring that leaders cannot signal their commitment beforehand, our design helps to isolate the effect of a leader's contribution and group identity on a follower's conditional cooperation.<sup>9</sup>

Consistent with previous field (Gangadharan et al., 2016, 2019), and laboratory (Drouvelis and Nosenzo, 2013) experiments, we find that ingroup leaders induce substantially higher average contributions from their groups making them more effective leaders. We contribute to the literature by investigating the underlying mechanisms behind the differences in cooperation under ingroup and outgroup leadership. Separately studying leader and follower behavior reveals that both followers and leaders exhibit ingroup favoritism. Additionally, consistent with our theoretical prediction, we

<sup>&</sup>lt;sup>8</sup>There is extensive literature that shows how leaders resolve social dilemmas and help in shaping the growth of nations (Chattopadhyay and Duflo, 2004; Jones and Olken, 2005), organizations (Zehnder et al., 2017; Brandts et al., 2015) and providing public goods. (Güth et al., 2007; Potters et al., 2007; Gächter et al., 2012; Gächter and Renner, 2018).

<sup>&</sup>lt;sup>9</sup>Conditional cooperation can hamper a leader's willingness to lead-by-example as followers mostly contribute less than the leader (Güth et al., 2007; Rivas and Sutter, 2011).

find that outgroup leaders ask for significantly lower contributions. It appears that outgroup leaders themselves are less interested in fostering cooperation in groups. One possible interpretation of this result can be that outgroup leaders consider themselves illegitimate<sup>10</sup> and do not exert sufficient effort to foster cooperation (in our experiment, "exerting effort" would mean asking for a higher contribution from group members). Our results vary from Drouvelis and Nosenzo (2013), who find that higher contributions are mainly driven by leaders but find no significant differences in follower contributions after controlling for leaders' contributions. Thus, our paper is the first to show that higher effectiveness of ingroup leaders can stem from followers' ingroup preferences as well as from outgroup leaders' reluctance to exercise effective leadership.

Belief elicitation results which shed light on the fact that the lower effectiveness of outgroup leaders can be partly due to negative beliefs is our final contribution. We find that beliefs about the contributions made by outgroup leaders are consistently lower than their actual contributions. Cooperation in groups and hence leader effectiveness depends crucially on perceptions about leaders (Grossman et al., 2019). Thus, our results suggest that outgroup leaders are not just less effective in fostering cooperation but are also perceived to be less cooperative. This can result in a self-fulfilling prophecy.

The rest of the paper is organized as follows. In Section 2, we review the literature on social identity and leadership. Section 3 explains the theoretical model and outlines the main hypotheses of this paper. Section 4 documents the experimental design and procedures. Section 5 provides an overview of the data and an analysis of the experimental results. Section 6 concludes.

<sup>&</sup>lt;sup>10</sup>Leader effectiveness is shown to increase when leaders are viewed as legitimate (Levy et al., 2011; Brandts et al., 2015).

# 2 Related literature

Several papers show that the presence of a leader (Potters et al., 2007; Chaudhuri, 2011; Rivas and Sutter, 2011; Gächter et al., 2012; Arbak and Villeval, 2013; Drouvelis and Nosenzo, 2013) in addition to communication (Levy et al., 2011; Houser et al., 2014; Sahin et al., 2015; Gangadharan et al., 2016, 2019; Boulu-Reshef et al., 2020) play a significant role in resolving conflicts of interest and facilitating cooperation. In addition, studies have found that leader contributions heavily influence follower contributions, that is, followers conditionally cooperate with the leader's contribution decision. (Keser and Van Winden, 2000; Croson, 2007; Fischbacher and Gächter, 2010; Gächter et al., 2012; Gächter and Renner, 2018).

Additionally, many experimental studies show that shared group identity is another factor that increases group cooperation. Most studies either: (i) prime existing natural social identities (Bernhard et al., 2006; Goette et al., 2006; McLeish and Oxoby, 2011; Chowdhury et al., 2016) such as race, age, religion, culture, gender, ethnicity, nationality; or (ii) use a "minimal group paradigm" design, where individuals are assigned to groups with no regard to previous interaction, or pre-formed identities. Using a minimal group paradigm design, Chen and Li (2009) found that group identity positively affects cooperation in single-level interactions. Charness et al. (2007) find that when group membership is made more salient by allowing the presence of one's own group as a passive audience, the decision-maker makes choices that favor the ingroup. Eckel and Grossman (2005) analyzed whether induced identity mitigates free-riding behavior in a team production setting. They showed that team identification actions could significantly increase cooperative behavior. Pan and Houser (2013) find that a cooperative production environment that creates artificial identities is associated with lesser parochialism than an independent production process. In our study, we use a "minimal group paradigm" design to search for the weakest cohesion that will create a shared group identity. Our paper brings together these two vast strands of literature to investigate whether the interaction between group identity and a costless cheap-talk signal can enhance group efficiency and hence leader effectiveness. However, the interaction between group identity and leadership can also lead to specific biases, such as discrimination against leaders who do not share the group identity. Li (2020) provides an independent survey of group identity and ingroup bias with applications to labor market discrimination. For instance, an argument for hiring insider CEOs over outsider CEOs is that insider CEOs already have an established network with their subordinates. This is in contrast to outsider CEOs, who often face initial resistance within the firm. (Chung et al., 1987). A recent paper by Bhalotra et al. (2021) finds that a history of intergroup conflict has a detrimental effect on the effectiveness of minority (Muslim) leaders under all policy regimes in India but does not significantly influence majority (Hindu) leader effectiveness.

Specifically, ingroup bias against outgroup leaders can lower overall cooperation and efficiency in groups and become a challenge for effective diverse leadership. Studies have shown that increasing the representation of racial minorities in leadership may help increase firm performance (Roberson and Park, 2007). Companies with executive teams in the top quartile for gender diversity are 25 percent more likely to have above-average profitability (Hunt et al., 2020). Diversity in leadership can lead to a rich variety of perspectives, reduce groupthink (Ostrom, 2008), increase worker productivity (Ranganathan and Shivaram, 2021) and have a trickle-down effect as well (Matsa and Miller, 2011). It is important to understand the ramifications of shared social identities between leaders and followers to prevent the negative consequences arising from ingroup bias.

# 3 Model and Hypotheses

## 3.1 Social Dilemma without Identity

We consider a standard linear voluntary contribution mechanism (VCM) or a linear *n*-player repeated public goods game. Each player j has a private endowment y > 0. The player who is in the role of a leader sends a contribution suggestion  $g_0$  to the other group members. All group members then simultaneously choose how much to contribute in the group account  $g_j \leq y$  and how much to keep in their own private account. Each unit kept in the private account is worth one dollar, and each unit contributed to the group account yields  $\alpha \leq 1$  dollar to each group member. Thus, in a group of *n* players, the payoff  $\pi_j$  for each group member *j* is given by:

$$\pi_j = y - g_j + \alpha \sum_{i=1}^n g_j; \qquad 0 < \alpha < 1 < n\alpha, n \ge 2$$
(1)

By standard economic theory, the contribution suggestion (i.e., cheap talk) should have no effect on group members' contribution decisions. The leader knows that followers may not follow her contribution suggestion and therefore has little incentive to follow the contribution suggestion herself. The dominant strategy Nash equilibrium is for each group member to contribute zero to the group account for each round as the return from contributing to the private account is higher than the return from contributing to the group account. This follows from :

$$\frac{\partial \pi_j}{\partial g_j} = -1 + \alpha < 0 \tag{2}$$

where  $1 < n\alpha$ . In the absence of identity, given that the leader's contribution suggestion is a common signal, there are two potential equilibria - the Nash equilibria strategy,  $g_j^* = 0 \forall j$  and the cooperative strategy  $g_j^* = g_0 > 0 \forall j$ .

#### 3.2 Social Dilemma with Identity

#### 3.2.1 Contribution Decision

Building on previous work (Akerlof and Kranton, 2000; Gangadharan et al., 2016), we include "identity"- based payoffs and augment equation (1).  $\pi_j$  represents standard pecuniary payoffs,  $C_j$ represents the psychic costs incurred by deviating from the leader's suggestions and  $U_j$  denotes the utility of follower j (this includes the leader as a follower to follow her own suggestion) in each round in the modified payoff function, equation (3).

$$U_j = \pi_j - C_j \tag{3}$$

i) When a leader is present, the group norm or prescription is to match the leader's proposed contribution. Each group member (including the leader) j's identity payoff will then depend on the cost of deviation from the leader's proposed contribution. A group member j's cost of deviation is given by:

$$C_j = \beta_{jm}(g_0 - g_j); \qquad \beta_{jm} \ge 0 \tag{4}$$

 $\beta_{jm}$  represents the sensitivity of a group member to deviating from the leader's suggestion when the leader belongs to a category m. A leader can either be absent or belong to ingroup or outgroup category,  $m \in (N, I, O)$ . From the social identity literature, we know that followers are inclined to heed the advice of a leader when the leader belongs to the same group (Tajfel and Turner, 1982; Van Knippenberg and Hogg, 2003). Thus, the behavioral prediction of this model is that  $\frac{\partial C_j}{\partial (g_0 - g_j)} = \beta_{jI} \ge 1$ , that is, group members have a greater cost of deviation from an ingroup leader's suggestions. On the other hand, we predict that  $0 < \frac{\partial C_j}{\partial (g_0 - g_j)} = \beta_{jO} < 1$ , that is, a group member is less cost-sensitive to deviation from an outgroup leader's suggestion. Hence, a group member's optimization problem can be written as follows :

$$\max_{g_j} U_j = y - g_j + \alpha \sum_{j=1}^n g_j - \beta_{jm} (g_0 - g_j)$$
(5)

We assume that  $g_j \leq g_o$ . Given  $g_0$ , a group member's utility is a linear function of  $g_j$ . The best response will be a corner solution.

If  $-1 + \alpha + \beta_{jm} > 0$ , then  $g_j^* = g_0$  [As this is a symmetric game, the symmetric equilibrium,  $g_j^* = g_0 \forall j$ . Therefore, the assumption  $g_j \leq g_o$  is satisfied.]. From our behavioral predictions, we can say that  $-1 + \alpha + \beta_{jm} > 0$  is more likely when there is an ingroup leader.

If  $-1 + \alpha + \beta_{jm} < 0$ , which is more likely when there is an outgroup leader,  $g_j^* = 0$ .

ii) When a leader is absent, there are no costs of deviation from leader's suggestions and hence  $\beta_{jm} = 0$ . The optimization problem is the same as in equation 1 and the dominant Nash equilibrium strategy is  $g_j^* = 0 \forall j$ .

#### 3.2.2 Contribution Suggestion Decision

When  $-1 + \alpha + \beta_{jm} > 0$ , we know that  $g_j^* = g_0 \forall j$ . The leader's utility function can be re-written as:

$$U_j = y - g_0 + \alpha \sum_{j=1}^n g_0 - \beta_j (g_0 - g_0) = y - g_0 + n\alpha g_0 = y + (-1 + n\alpha)g_0$$
(6)

Since  $\alpha > 1/n$ , we must have  $-1 + n\alpha > 0$ . Therefore the leader's best response is  $g_o^* = y$ . When  $-1 + \alpha + \beta_{jm} < 0$ , we know that  $g_j^* = 0 \forall j$ . In this case, the leader's utility function is :

$$U_j = y - \beta_{jm}(g_0) \tag{7}$$

If the leader's suggestion  $g_0 > 0$ , she will suffer the identity loss of deviating from her own suggestion. Therefore, the best response is:  $g_0^* = 0$ .

Solving the equilibrium, we have: 1) If  $-1 + \alpha + \beta_{jm} > 0$ , then the equilibrium is  $g_j^* = g_0^* = y$ . Otherwise, the equilibrium is  $g_j^* = g_0^* = 0$ .

## 3.3 Hypotheses

**Hypothesis 1** Groups with ingroup leaders will exhibit more cooperation than groups with outgroup leaders.

**Hypothesis 2** Groups with leaders (ingroup and outgroup) will exhibit at least as much cooperation as groups without a leader.

From section 3.2.1 of the model, we directly obtain that the mean contributions by group members will be higher (and hence higher cooperation) under ingroup leadership  $(g_j^* > 0)$  than outgroup leadership  $(g_j^* = 0)$ . Similarly, we obtain that in the absence of a leader, group members will contribute  $g_j^* = 0$  to the public good whereas in the presence of a leader, group members will contribute  $g_j^* \ge 0$ .

**Hypothesis 3** Groups (followers) will follow contributions suggestions sent by ingroup leaders equally closely to those sent by outgroup leaders.

Hypothesis 4 Ingroup and outgroup leaders will follow their contribution suggestions equally closely.

From the equilibrium conditions, it follows that groups (followers) will match the contribution suggestions made by ingroup leaders  $(g_j^* = g_0^* = y)$  and by outgroup leaders  $(g_j^* = g_0^* = 0)$ . Hypothesis 4 follows Hypothesis 3. If groups and followers match the contribution suggestions of ingroup (outgroup) leaders, then it will be true for leaders as well.

**Hypothesis 5** Ingroup leaders will encourage their followers to cooperate more than outgroup leaders.

Using the behavioral predictions, we obtain from section 3.2.2 that ingroup leaders will suggest a higher amount,  $g_0^* = y$  than outgroup leaders who will suggest  $g_0^* = 0$ .

#### Hypothesis 6 Ingroup leaders will be perceived as more cooperative than outgroup leaders.

The final hypothesis revolves around perceptions of leader effectiveness. In the absence of group identity, individuals have no reason to expect a difference in cooperation between an ingroup and an otherwise identical outgroup leader. However, recent research has shown that employees hold negative prior beliefs against equally productive outgroup employers (Asad et al., 2020). Likewise, group members hold negative prior beliefs about female leadership (Abel, 2022). In contrast, they have overconfident beliefs about own group members' performance (Cacault and Grieder, 2019). Group members may perceive their own group leaders as more welfare-concerned and simultaneously harbor negative beliefs about the motives of outgroup leaders. Hence, we predict that group members' prior beliefs will be that ingroup leaders contribute more than outgroup leaders.

# 4 Experimental Design and Procedures

Our goal is to test the impact of group identity on ingroup and outgroup leadership. The treatment variable is, therefore, 'leader type'. We consider three different treatments giving us a 1x3 factorial design.

The experiment consists of two parts. Part 1 is a "puzzle game", which is a production process primarily following Pan and Houser (2013). This helps build the group identity. In part 2, we introduce our leader treatments. Each treatment consists of a 20 rounds public goods game. The three leader treatments are the "No Leader", "Ingroup Leader" and the "Outgroup Leader" treatments. Table 1 shows the structure of the experiment. A detailed description of our experiment design follows.

| Treatment Part 1 |        | Rounds    |                        | Rounds | in | Sample |
|------------------|--------|-----------|------------------------|--------|----|--------|
|                  |        | in Part 1 | Part 2                 | Part 2 |    | Size   |
| NoL              | Puzzle | 1         | Public goods game with | 20     |    | 32     |
|                  | game   |           | no leader              |        |    |        |
| InL              | Puzzle | 1         | Public goods game with | 20     |    | 64     |
|                  | game   |           | ingroup leader         |        |    |        |
| OutL             | Puzzle | 1         | Public goods game with | 20     |    | 64     |
|                  | game   |           | outgroup leader        |        |    |        |

#### Table 1: EXPERIMENTAL DESIGN STRUCTURE

## 4.1 Puzzle Game

Part 1 is a key element of our experiment. Its primary purpose is to induce artificial group identities. Using a two-fold identification strategy to induce stronger group effects, we assigned labels to each group. We then asked the groups to participate in a cooperative production process. Additionally, we incentivized and encouraged inter-group competition to complete the production task within a stipulated time to study inter-group conflict.

Four groups (of four members each) finished the same puzzle task in an open environment that facilitated cooperation. The groups were asked to complete the task in separate rooms. Then, two groups were randomly chosen and asked to move out of the experimental laboratory and go to the rooms assigned to them. Those two groups were not allowed to interact with the other groups after completing their tasks. This helped to ensure that there was no inter-group discussion of strategy. An experimenter in each room noted the time each group took to complete their task. The four groups were given ten minutes to complete the task. We named the groups: Red Square, Yellow Rectangle, Purple Rectangle, and Blue Square. Each group was assigned the task of piecing together four identical shapes of a red square, yellow rectangle, purple rectangle, and blue square, respectively.<sup>11</sup> All the puzzle tasks shared the same level of difficulty and thus required the same level of cooperation from each group. The group that took the least time to finish the task earned an additional two dollars for each member. The winning group was not announced until the conclusion of the experiment. A total of 160 subjects participated in the puzzle game with 32 subjects moving on to the No Leader treatment, 64 subjects moving to the Ingroup Leader treatment, and 64 subjects moving to the Outgroup Leader treatment.

## 4.2 Public Goods Game

Part 2 uses the methodology of a standard linear public goods game similar to Houser et al. (2014), widely used to study social dilemma problems. For this part of the experiment, new groups of four members were formed. Three of the four members in each group (followers) were the same as in the puzzle game; the remaining member (leader) could be the same or vary.<sup>12</sup> Each subject received an endowment of 10 E\$. At the beginning of the game, one member in each of the four new groups was randomly selected as a leader. The other three members were assigned the role of followers. These leaders sent a message (contribution suggestion) to all their group members each round. Subjects were aware that the person writing the message would have no other special role in the remainder of the experiment. The subject who wrote the message remained anonymous to the other participants.<sup>13</sup> Followers were told about the leader's role and group identity and informed

<sup>&</sup>lt;sup>11</sup>A figure showing the exact cuts of the puzzle is shown in the Appendix.

<sup>&</sup>lt;sup>12</sup>In the experiment, we never mention the words 'leader and 'non-leader' or 'follower', but instead, we use 'message-

writer' and 'message-receiver' respectively.

<sup>&</sup>lt;sup>13</sup>All subjects were given personal identity numbers and seated separately in front of computer screens. Subjects' roles appeared on their computer screens to preserve anonymity.

that the same message had been received by all three followers. There was one-way communication from the leader and the leader's message was non-binding.

Leaders were randomly selected and remained in the same role for the entire experiment. The reason is that we are interested in the effect of relational identity when group members and leaders have repeated interactions. Random selection of leaders helps to minimize the potential interaction between election mechanisms and the identity effect. This allows us to draw clean inferences for the role of identity in leader effectiveness.

#### 4.2.1 No Leader Treatment

The No Leader treatment serves as a control for the Ingroup Leader and Outgroup Leader treatments. Four groups played a standard linear public goods game for exactly 20 rounds without a leader. Group members belonged to the same groups as in the puzzle game.

#### 4.2.2 Ingroup Leader Treatment

In the Ingroup Leader treatment, we deviate slightly from the standard linear public goods game. At the beginning of the game, subjects were informed whether they had been selected as a leader. The leader sends out a message before each round that reads:

"Let us contribute \_\_\_\_\_ E\$ to the group account."

Along with the message, the followers were informed that the leader and the followers belonged to the same group as in the puzzle game (Part 1 of the experiment). In other words, all four players had interacted previously making the leader an ingroup leader.

After the followers observed the leader's non-binding contribution suggestion, the leader and

the followers simultaneously made their contribution decisions in private. The leader's contribution suggestion was non-binding. At the end of end round, each subject only observed aggregate information. They observed their group contribution and their own contribution. Leaders and followers were not able to observe each other's individual contribution decisions.

## 4.2.3 Outgroup Leader Treatment

The only difference in this treatment is that the leader was an outgroup member. As in the other treatments, the leader was randomly selected; however, the leader did not belong to the same group as the followers in the puzzle game. As a result, even though the three followers had previously interacted with each other, none of them had previously interacted with the leader. This made the leader an outgroup leader. Similar to the Ingroup Leader treatment, once the followers have observed the leader's contribution suggestion, the leader and the followers simultaneously made their contribution decisions in private and observed aggregate contribution decisions at the end of each round.

## 4.3 Belief Elicitation Task

As part of the public goods game, a single question about beliefs appeared on the computer screen before subjects were assigned their respective roles. Specifically, in the Ingroup (Outgroup) Leader treatment, we asked subjects to estimate the average amount that an outgroup (ingroup) leader would contribute to the group account.<sup>14</sup>

<sup>&</sup>lt;sup>14</sup>In the experiment, we never use the words "outgroup leader" and "ingroup leader". We define an outgroup leader as a message-writer who did not belong to the same group as the subject in Part 1 of the experiment and an ingroup leader as a message-writer who belonged to the same group as the subject in Part 1 of the experiment.

#### 4.4 Procedures

There were 10 sessions which included 16 subjects each. The experiments were conducted in The Interdisciplinary Center of Economic Science laboratory at George Mason University. All the subjects were undergraduate students from this university. Subjects earned a \$5 bonus for arriving on time and they earned payment in E\$ during the experiment. At the end of the experiment, E\$ was exchanged for dollars at the rate of 2E\$ = \$1. On average, the subjects were in the laboratory for 90 minutes and earned \$12 in addition to the show-up bonus.

In each session, 16 subjects were randomly assigned to four groups before the puzzle game. Two separate sets of paper instructions were provided in each part.<sup>15</sup> The instructions for Part 2 were provided after all had completed Part 1 of the experiment. Subjects were given a short quiz to answer in each part. Answers to questions were monitored and the experiment did not begin until all subjects demonstrated their comprehension of the experiment instructions.

In part 1, each subject was given one envelope. Each envelope would contain four puzzle pieces. The task for each group would be to complete the puzzle by making four identical shapes from the 16 pieces given to the group. For example, Red Square group members had to complete four red squares from all the 16 puzzle pieces given to the Red Square group.

Part 2 of the experiment was computerized. It was conducted using the software platform oTree (Chen et al., 2016). The randomly chosen leader's information appeared on the computer screens of the subjects. Afterward, the leaders sent their messages to the followers and the group members saw this message on their computer screens. At the end of the experiment, the subjects completed a short-post experimental questionnaire eliciting basic demographic information.

<sup>&</sup>lt;sup>15</sup>The experiment instructions are provided in the Appendix.

# 5 Results



### 5.1 Contribution to the Public Good

Figure 1: MEAN CONTRIBUTION (INCLUDING LEADERS).

Figure 1 displays the mean contributions to the group account for each treatment condition.<sup>16</sup> Mean contributions in the Ingroup Leader treatment were higher than the Outgroup Leader and No Leader treatments from the first round (Ingroup: E\$7.13, Outgroup: E\$6.06, No Leader: E\$5.25) to the last round (Ingroup: E\$7.67, Outgroup: E\$5.17, No Leader: E\$4.44).

We compare the average group contributions across treatments over 20 rounds by calculating each group's total contribution. The sample size is 16 in the Ingroup Leader treatment, 16 in the Outgroup Leader treatment, and 8 in the No Leader treatment. We find that the mean contribution is significantly higher in the Ingroup Leader treatment than in the Outgroup Leader treatment (7.75 vs. 5.59, p = 0.00, Mann-Whitney two-sided test). Similarly, the difference in the mean

<sup>&</sup>lt;sup>16</sup>The figures displaying the mean contributions of leaders (only) and followers (only) are given in the Appendix.

contribution of Ingroup Leader treatment and No Leader treatment is significant (7.75 vs. 5.36, p < 0.001, Mann-Whitney two-sided test). Both the results indicate that group cooperation is significantly with ingroup leaders. However, the difference in the mean contribution of No Leader and Outgroup Leader treatments is not significant (5.36 vs. 5.59, p = 0.168, Mann-Whitney two-sided test). We next report regression analysis results to compare the dynamics of the contributions among treatments.

Table 2 reports the results of two random group effects, censored regressions of group account contributions by each group on an intercept and trend effects by treatment. <sup>17</sup> Standard errors are clustered at the group level to control for the potential dependency of decisions within groups. The first regression includes leaders and followers, while the second includes followers only. Testing the null hypothesis that intercept and round coefficient are pair-wise jointly identical between treatment conditions yields similar results for both regressions: we reject equality of Ingroup Leader and Outgroup Leader treatments (chi-square tests, p < 0.05), of Ingroup Leader and No Leader treatment (chi-square tests, p < 0.05) and also of No Leader and Outgroup Leader treatments at conventional significance levels (chi-square tests, p < 0.05).

**Result 1.** Consistent with hypothesis 1, we find that groups on average make significantly lower contributions to the public good under outgroup leadership than under ingroup leadership.

**Result 2.** Consistent with hypothesis 2, we find that groups with ingroup leaders on average make significantly higher contributions to the public good than groups without a leader. However, we find no significant difference in mean contributions between groups with outgroup leaders and groups with no leaders.

<sup>&</sup>lt;sup>17</sup>We obtain qualitatively similar results using OLS. These alternative estimates are available upon request.

|  | Mean contribution of each | Mean contribution of each  |  |
|--|---------------------------|----------------------------|--|
|  | group in each round       | group in each round        |  |
|  | (Including the leader)    | (Not including the leader) |  |
| No leader (= 1 if in No Leader treatment;    | -1.695***                 |                            |  |
| = 0 otherwise)                               | (0.359)                   |                            |  |
| In<br>group leader (= 1 if in Ingroup Leader | 7.401***                  | 7.323***                   |  |
| treatment; $= 0$ otherwise)                  | (0.269)                   | (0.288)                    |  |
| Outgroup leader (= 1 if in Outgroup          | -1.632***                 | -1.785***                  |  |
| Leader treatment; $= 0$ otherwise)           | (0.359)                   | (0.182)                    |  |
| Pound y No loodon                            | -0.033                    |                            |  |
| Round x No leader                            | (0.034)                   |                            |  |
| Pound y Ingroup leader                       | 0.034                     | 0.033                      |  |
| Round x higroup leader                       | (0.024)                   | (0.026)                    |  |
| Pound y Outgroup loader                      | -0.017                    | -0.003                     |  |
| Round x Outgroup leader                      | (0.021)                   | (0.03)                     |  |
| Observations (n)                             | 800                       | 640                        |  |
| R-squared                                    | 0.19                      | 0.12                       |  |

Table 2: CENSORED REGRESSION ANALYSIS OF GROUP LEVEL CONTRIBUTION OF ALL ROUNDS

*Note*: Dependent variables are calculated as the average of group members' contributions (including or excluding the leader) in each round. Numbers in parentheses are standard errors.

\* p<0.05; \*\* p<0.01; \*\*\* p<0.001

## 5.2 Message Following Behavior



Figure 2: MEAN ABSOLUTE DEVIATIONS FROM CONTRIBUTION SUGGESTIONS (INCLUDING LEAD-ERS).

Figure 2 visualizes mean absolute deviations from leaders' suggested contributions over 20 rounds when including followers and leaders.<sup>18</sup> We find that followers and leaders on average followed leaders' suggestions more closely in the Ingroup Leader treatment than in the Outgroup Leader treatment. Mean deviations fluctuate in the range of 2.58-4.01 E\$ and 1.65-2.95 E\$ for Outgroup Leader and Ingroup Leader treatments respectively.

Breaking up the sample into leaders (Figure 3a) and followers (Figure 3b), we find that the patterns are similar. Similar to the pattern in Figure 2, mean absolute deviations in the Ingroup

<sup>&</sup>lt;sup>18</sup>Figures C.1a and C.1b visualizing the mean negative deviation from ingroup and outgroup leaders' suggested contributions over 20 rounds (including leaders and followers) are given in the Appendix. These figures show that outgroup leaders send higher non-credible signals at 1 percent level of significance.

Leader treatment are universally lower than in the Outgroup Leader treatment (except at round 15) both for followers and leaders.

To provide statistical analysis of the differences across treatments, we report in Table 3 the results of a random group effect, censored regression of the mean absolute deviation of each group's mean contribution from the suggested contribution on an intercept and the round. Testing for pair-wise joint equality of coefficients across treatments, we can reject joint equality of coefficient estimates for the Ingroup Leader and Outgroup Leader treatment (chi-square test, p < 0.05)

**Result 3.** Consistent with hypothesis 3, we find that groups/followers deviate more on average from contribution suggestions made by outgroup leaders than ingroup leaders.

**Result 4.** Consistent with hypothesis 4, we find that outgroup leaders deviate more on average from their own contribution suggestions than ingroup leaders.

Table 3: CENSORED REGRESSION OF THE MEAN ABSOLUTE DEVIATION FROM THE LEADERS' SUGGESTED CONTRIBUTION.

|  | Mean absolute deviation from |
|--|------------------------------|
|  | suggestion coefficient       |
| Ingroup leader (= 1 if in Ingroup Leader   | 1.323***                     |
| treatment; $= 0$ otherwise)                | (0.162)                      |
| Outgroup leader (= 1 if in Outgroup Leader | 0.638**                      |
| treatment; $= 0$ otherwise)                | (0.23)                       |
|  | 0.000                        |
| Round x Ingroup leader                     | (0.015)                      |
|  | 0.019                        |
| Round x Outgroup leader                    | (0.015)                      |
| Observations (n)                           | 640                          |
| R-squared                                  | 0.08                         |

*Note*: The dependent variable is calculated by taking the average of absolute difference between the group leader's suggested contribution and each member's actual contributions (including the leader) in each group in each round. Numbers in parentheses are standard errors.

\* p<0.05; \*\* p<0.01; \*\*\* p<0.001



(b) Followers only

Figure 3: Mean absolute deviations from contribution suggestions





Figure 4: MEAN SUGGESTED CONTRIBUTION

Figure 4 visualizes the average contribution amounts suggested by group leaders in the Ingroup Leader and Outgroup Leader treatments. Ingroup leaders' average contribution suggestions per round varied between 9.50 E\$ and 7.69 E\$, and that of outgroup leaders' varied between 8.00 E\$ and 6.31 E\$.

Table 4 reports random group effect regression results of the suggested contribution amounts by each group leader on an intercept and the round.<sup>19</sup> Standard errors are clustered at the group level to control for the potential dependency of decisions within groups. We reject the null hypothesis that coefficients are jointly identical between ingroup leaders and outgroup leaders (chi-square test, p < 0.01). The estimates reported in Table 4 imply that contribution suggestions significantly increase over rounds in the Ingroup Leader treatment. However, in the Outgroup Leader treatment,

<sup>&</sup>lt;sup>19</sup>Table B.1 in the Appendix compares mean absolute deviations from suggested contributions across treatments.

there is a decline in recommendation amounts over rounds.

|   | Contribution level suggested by each |
|---|--------------------------------------|
|   | leader in each round coefficient     |
| Ingroup leader (= 1 if in Ingroup Leader treat- | 8.093***                             |
| ment;   | (0.256)                              |
| = 0 otherwise)                                  |                                      |
| Outgroup leader (= 1 if in Outgroup Leader      | -0.771                               |
| treatment;                                      | (0.404)                              |
| = 0 otherwise)                                  |                                      |
| Dound y Ingroup loadon                          | 0.048*                               |
| Round x higroup leader                          | (0.021)                              |
| Downd y Outomour loodon                         | -0.018                               |
| Kound x Outgroup leader                         | (0.029)                              |
| Observations (n)                                | 640                                  |
| R-squared                                       | 0.08                                 |

Table 4: Censored regression analysis of leaders' contribution suggestion

*Note*: The dependent variable is the contribution level suggested by each leader in each round. Numbers in parentheses are standard errors.

\* p<0.05; \*\* p<0.01; \*\*\* p<0.001

**Result 5.** Consistent with hypothesis 5, we find that ingroup leaders make significantly higher contribution suggestions to their groups than outgroup leaders.

## 5.4 Perceptions of Leader Effectiveness

Figures 5 and 6 show the beliefs of the subjects in the Ingroup (Outgroup) Leader treatment about the possible contributions that can be made by outgroup (ingroup) leaders and the actual contributions made by the outgroup (ingroup) leaders. The figures provide strong evidence of a difference in beliefs about ingroup and outgroup leaders.

In Figure 5 the beliefs about contributions that can be made by outgroup leaders are consistently lower than the actual contributions made by outgroup leaders. The beliefs were elicited in the Ingroup Leader treatment and data on the actual contributions has been collected from the Outgroup Leader treatment. We find that the mean outgroup leader contributions are significantly higher than the beliefs made by ingroup subjects about the former' contributions (5.87 vs. 3.94, p = 0.02, Mann-Whitney two-sided test). On the contrary, the difference in the mean ingroup leader contributions and the beliefs made by outgroup subjects about the former's contributions is not significant at 5 percent level of significance. (8.00 vs. 6.15, p = 0.083, Mann-Whitney two-sided test.)

**Result 6.** There is no significant difference in beliefs about ingroup leader contributions and actual ingroup leader contributions. However, consistent with hypothesis 6, we find that beliefs about outgroup leader contributions are significantly lower than actual outgroup leader contributions.



Figure 5: Comparison of Beliefs about mean contributions made by outgroup leaders and their actual mean contributions



Figure 6: Comparison of Beliefs about mean contributions made by ingroup leaders and their actual mean contributions

## 6 Concluding Discussion

Effective leaders play an important role in mitigating cooperation failures. We contribute to the literature by analyzing how shared group identity between leaders and followers affects leader effectiveness and shapes beliefs about leader efforts. Using a novel laboratory experiment, we find that ingroup leaders are more effective because they encourage and induce higher cooperation in their groups. By examining mechanisms that could explain the observed behavior, we find that significantly lower follower and leader contributions drive the differences in cooperation under ingroup and outgroup leaders. Our results thus reveal that both leaders and followers exhibit ingroup favoritism and outgroup discrimination.

Further, we obtain two key insights about the effect of group identity on leader effectiveness. First, we find that followers, on average, deviate significantly more from outgroup leaders' contribution suggestions. This implies that outgroup leaders are less influential in fostering group cooperation. Interestingly, outgroup leaders significantly deviate more from their own contribution suggestions. This result suggests that strategic concerns have an important bearing on a leader's decision-making. Suppose a leader expects followers to contribute less knowing that the contribution signal is coming from an outgroup leader. In that case, an outgroup leader will face higher costs for following their own signal. They may prefer to deviate and obtain higher utility. Our finding extends previous experimental evidence which found that some leaders do not follow their own suggestions in public good games (Levy et al., 2011; Gangadharan et al., 2019). In the long run, such behavior from leaders could reduce trust and cooperation within groups and render the leader less effective.

Second, we find that contribution signals sent by ingroup leaders are starkly and significantly greater than outgroup leaders. This novel result suggests that outgroup leaders do not sufficiently encourage their groups to cooperate by asking them to contribute higher amounts to the public good. A possible explanation can be that outgroup leaders perhaps do not think of themselves as "legitimate" (Brandts et al., 2015) leaders. This could make them feel less concerned about overall group welfare, unlike ingroup leaders. Our result suggests that future research should focus on the legitimacy of leaders as an important channel for enhancing leader effectiveness.

We also find that there is no statistically significant difference in average group contributions under outgroup leaders and in groups with no leaders. One possibility is that an outgroup leader is deemed to be a "bad apple" (Grund et al., 2018) or someone who is a free rider. This expectation about the leader's uncooperativeness leads to low contributions within the whole group. Our belief-elicitation results corroborate negative expectations about the leader. We find that prior beliefs about the contributions made by outgroup leaders are consistently lower than their actual contributions. Thus, our analysis suggests that an outgroup leader otherwise identical to an ingroup leader is nevertheless perceived to be less cooperative. Negative beliefs about the performance of outgroup leaders perhaps lead to the breakdown of contributions within groups. This intriguing finding of our experiment suggests that outgroup leaders are less effective in part because of low effectiveness and in part because followers have prior negative beliefs about their efforts. Our results are consistent with a nascent literature that has found evidence of belief-based discrimination by subordinates against outgroup leaders (Ayalew et al., 2018; Chakraborty and Serra, 2019; Grossman et al., 2019; Asad et al., 2020; Abel, 2022).

Overall, our findings help explain why outgroup leadership is relatively rare in business and social environments. The lack of diversity in leadership is a missed opportunity for organizations to create an inclusive environment. Representation from diverse leaders is essential in correcting any prior negative perceptions about outsiders<sup>20</sup>. Further, increasing diversity in leadership can help make leaders more adaptable and help organizations retain diverse team members. Thus, ingroup

<sup>&</sup>lt;sup>20</sup>Outsider leaders are better equipped to make objective, innovative organizational changes. (Lorenzo et al., 2018)

favoritism in leadership needs to be appropriately addressed by organizations and policymakers. A policy implication of our paper is to have more inclusion: by broadening the definition of an ingroup, we can reduce the number of leaders labeled as 'outgroup' leaders. For leadership to be a more effective tool, we must first understand the positive and negative effects of shared social identities. This paper is a step to beginning such an understanding.

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