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Unethical behavior, lying, group identity, competition, experiment

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C92, M54, D63

# Unethical Behavior and Group Identity in Contests

Julien Benistant<sup>1</sup> and Marie Claire Villeval<sup>2</sup>

*Abstract:* Using a real-effort experiment, we studied how minimal group identity affects unethical behavior in a contest game. We varied (i) whether individuals had to report their own output or the output of their competitor, (ii) whether group identity was induced or not, and (iii) whether pairs of competitors shared the same group identity or not. We show that individuals misreported in the same proportion and to the same extent by inflating their output or by decreasing their opponent's output. Misreporting was affected neither by the competitor's group identity nor by the individual's beliefs about misreporting. This suggests that in such competitive settings, unethical behavior is mainly driven by an unconditional desire to win.

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## 1. Introduction

The Association of Certified Fraud Examiners (ACFE, 2016) estimates that unethical behavior in organizations leads to a loss of about US\$6.3 billion for the global economy.<sup>1</sup> Occupational fraud is a scourge for any organization, as it may lower employees' well-being, discourage honest effort, and ruin the reputation of a unit or company if uncovered. Dishonesty in organizations may depend on the presence of "bad apples" (*e.g.*, Gino *et al.*, 2009), but also on the institutional regime itself, including weak societal norms (*e.g.*, Gächter and Schulz, 2016), corporate culture encouraging materialistic values (*e.g.*, Cohn *et al.*, 2014), and competitive schemes (*e.g.*, Shleifer, 2004; Falk and Szech, 2013). In companies, competitive incentives aim at motivating employees (Tullock, 1980; Lazear and Rosen, 1981). However, a risk of sabotage among competitors has been shown both theoretically (Lazear, 1989; Konrad, 2000) and empirically (*e.g.*, Harbring *et al.*, 2007; Carpenter *et al.*, 2010; Harbring and Irlenbusch, 2011; Kilduff *et al.*, 2016; Feltovich, 2017); moreover, cheating opportunities lead less honest people to self-select into more competitive payment schemes (Faravelli *et al.*, 2015).

The prevalence of unethical behavior in competitive settings depends on the environment, namely the intensity of competition (*e.g.*, Schwieren and Weichselbaumer, 2010; Harbring and Irlenbusch, 2011; Cartwright and Menezes, 2014; Conrads *et al.*, 2014) or the outcome of a previous competition (Pittarello *et al.* 2013; Banerjee *et al.*, 2016; Schurr and Ritov, 2016). Among these environmental factors, one can suspect that the strength of preexisting links between potential competitors in a group may affect the prevalence of unethical behavior. For example, an employee who competes for a promotion against one of his team members may be less likely to behave unethically than when faced with an employee from another, more distant, group. Our main research objective in this paper is to identify the influence of group

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<sup>1</sup> This report focuses on 2,410 cases of occupational fraud collected between January 2014 and October 2015. Under this label, it includes corruption, asset misappropriation, and financial statement fraud.

identity and social distance between competitors on unethical behavior in competitive settings.

Specifically, we study whether the social identity of their opponent in a competition affects individuals' willingness to misreport an outcome that contributes to determining their payoff. Are people less willing to misreport in order to increase their chance of winning a competition when doing so harms an in-group? On the other hand, are they more willing to misreport when cheating harms an opponent from another group? We also examine whether group identity has a different impact, if any, when individuals have to report their own outcome and when they have to report their opponent's outcome to determine who is the winner.

By connecting the studies on group identity, on competitive behavior, and on lying, our contribution is threefold. First, by considering the influence of social identification on unethical behavior, we complement the economic analysis of the role of group identity in social interactions. Having originated in social psychology (Tajfel and Turner, 1979), the concept of social identity has been introduced in economics by Akerlof and Kranton (2000). Since then, it has been the topic of many experimental studies. These studies have shown the importance of in-group favoritism, *i.e.*, the fact that people treat more generously someone who shares the same group identity than someone who belongs to another social group (*e.g.*, Charness *et al.*, 2007; Chen and Li, 2009; Goette *et al.*, 2012).<sup>2</sup> The previous literature has also shown that in competitive settings, behavior is affected by the competitors' group identity, in particular their gender (*e.g.*, Datta Gupta *et al.*, 2013) or their regional identity

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<sup>2</sup> In-group favoritism relaxes punishment toward out-group members (Bernhard *et al.*, 2006; Goette *et al.*, 2012), and positively affects coordination (Efferson *et al.*, 2008), trust and reciprocity (Buchan and Croson, 2004; Hargreaves Heap and Zizzo, 2009), generosity in dictator games (Güth *et al.*, 2009), cooperation in dilemma games such as public goods games (Eckel and Grossman, 2005), common-pool resource games (Ruffle and Sosis, 2006), and prisoner's dilemma games (Goette *et al.*, 2006; Charness *et al.*, 2007; Guala *et al.*, 2013; Li and Liu, 2017), as well as the willingness to preserve other's image at a cost (Eriksson *et al.*, 2017). Group identity also influences individual decision-making such as patience and risk attitudes (Benjamin *et al.*, 2010).

(Kato and Pian, 2016). Our contribution to this literature is exploring the impact of group identity on unethical behavior.

Second, we contribute to the analysis of lying behavior by studying how group identity affects the individuals' willingness to follow the moral course of action or not. The previous literature has shown that priming group identity increases the prevalence of norm violation when identity is associated with low morality (Cohn *et al.*, 2015). In social interactions, studies have found evidence of in-group favoritism in lying or deceptive behavior (*e.g.*, Jiang, 2014; Cadsby *et al.*, 2016; Chakravarty and Maximiano, 2016), but results are contrasted.<sup>3</sup> These contrasting results call for further research to better understand under which circumstances group identity has an impact on dishonesty. Testing a resource allocation game in diverse populations, Hruschka *et al.* (2014) showed that behaving dishonestly to favor in-groups instead of following an impartial rule is more likely in societies with lower institutional effectiveness. Our contribution is considering how competitive incentives affect the impact of group identity on unethical behavior in a setting where both competitors can cheat.

Finally, we contribute to the analysis of ethics in competition. As mentioned above, several studies have shown, theoretically and empirically, that some people are willing to bend their moral rules to increase their chance of winning a competition. But we know little about whether sabotaging a competitor is morally equivalent to cheating on one's own performance, when both actions similarly increase one's chance of winning. Addressing this question, Rigdon and D'Esterre (2015) found that individuals are more likely to cheat by overreporting their own performance than by underreporting their opponent's performance

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<sup>3</sup> Jiang (2014) and Cadsby *et al.* (2016) report that in a noncompetitive environment, subjects are more willing to lie when lying benefits a member of their group compared to when it benefits a member of another group. Similarly, cheating is lower when it harms another student compared to when cheating is at the expense of the experimenter (Meub *et al.*, 2016). Using a sender-receiver game with a natural group identity based on friendship, Chakravarty and Maximiano (2016) showed that deception is less likely when the receiver is a sender's friend. In contrast, using the same game Feldhaus and Mans (2014) found that the sender's decision to deceive the receiver is independent of whether they share the same group identity or not.

under both competitive and noncompetitive incentives. Lying about an opponent's outcome increases the moral cost of lying compared to lying about one's own outcome. We test whether inducing group identity amplifies this effect when the opponent is an in-group and cancels it out when the opponent is an out-group.<sup>4</sup>

To sum up, the novelty of our approach is studying the impact of group identity on the intensity and the nature of self-serving dishonesty in a competitive setting.<sup>5</sup> We designed a game based on a repeated two-player Tullock contest. The relative final scores of the players determined their probability of winning the contest. The final score of a player was the sum of his performance in a real-effort task and a random number that could represent his idiosyncratic environmental working conditions. After performing the task, subjects were informed of their performance and their number, and of the performance and the number of their opponent.

We manipulated within-subjects which information players had to report. In one condition, they had to report their own random number ("Self-condition"), while in the other condition they had to report their opponent's number ("Opp-condition"). When reporting, subjects had the opportunity to inflate their own number or to deflate their opponent's number, depending on the condition, with no risk of detection. Due to the use of a probabilistic contest, the final outcome of the competition and the feedback given to the subjects did not allow them to be certain about their opponent's honest or dishonest reporting.

We manipulated between-subjects the existence of group identity in two treatments. In the No-Identity treatment, no identity was induced. In the Identity treatment, a minimal

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<sup>4</sup> Note that people motivated by social status may behave competitively even without competitive monetary incentives. Charness *et al.* (2014) showed that individuals cheat more by artificially increasing their own performance than by sabotaging group members to improve their performance rank under a flat-payment scheme. In contrast, our experiment introduces competitive incentives and no monetary cost for lying.

<sup>5</sup> In a lab-in-the-field experiment in rural India, Banerjee *et al.* (2016) showed that high-caste individuals are more likely to lie to increase their payoffs while harming a member from the backward caste when they learn that they have lost a tournament under a quota policy protecting backward caste members. However, in this study the opportunity to lie follows a distinct tournament game. In contrast, we introduce an opportunity to lie in a contest.

identity was induced following the procedure developed in Chen and Li (2009). In some cases subjects were matched with a player who shared the same group identity and in other cases, they were matched with subjects with the other group identity.

Our results show that 53.7% of the individuals misreported at least once in the contest game and when they lied, they did it to the full extent. Contrary to our conjecture, in both treatments they misreported their opponent's outcome as often and by as much as when they misreported their own outcome. This suggests that in this competitive setting where lying is about a luck number and not about performance at the task, the moral cost of the two types of misreporting is the same. We found no effect of group identity on misreporting: there was no effect from social distance between the individual and his opponent on the frequency, the intensity, and the nature of lies. Although they expressed in-group favoritism in distributive choices and although they believed that group identity affected others' misreporting behavior, people did not lie less against their opponent when he was from the in-group than when he was from the out-group, or in the absence of group identity. Competitive pressure was so strong that the desire to win seemed to turn off the concern for affiliation.

The next section introduces our experimental design and the procedures. Section 3 outlines our behavioral conjectures. Section 4 reports our results. Finally, section 5 discusses these results and provides concluding remarks.

## **2. Experimental Design and Procedures**

We first introduce our experimental design before presenting the procedures.

### *2.1. Experimental Design*

Our experiment was based on a two-player contest played for 16 periods with a reshuffling of pairs after each period. The probability of each pair member winning the contest depended on a comparison of the two pair members' scores. A score was defined as the sum of the performance in a real-effort task and of an idiosyncratic random number that subjects had to



report, as explained below. We implemented a 2x2 mixed factorial design. One dimension varied within-subjects whether the individual had to report his own random number (“Self-condition”) or his opponent’s number (“Opp-condition”). The Self- and Opp conditions were implemented over eight periods each, and were presented in a randomized order. The other dimension varied between-subjects the presence of group identity in two treatments, namely the Identity treatment and the No-Identity treatment. We start by describing the first one.

### 2.1.1. No-Identity Treatment

#### *The Contest*

The game consisted of a two-player Tullock-lottery contest in which two subjects were paired and competed against each other to win a prize. The outcome of the contest depended on the relative final scores. In each period  $t$ , the probability of a given subject  $i$  matched with a subject  $j$  winning is given by the following formula:

$$p_{it}(\text{win}) = \frac{\text{Final score}_{it}}{\text{Final score}_{it} + \text{Final score}_{jt}} \quad (1)$$

The higher the subject’s final score relative to that of his opponent, the higher was his probability of winning. The winner received 100 ECUs (Experimental Currency Units) and the loser 50 ECUs. The final score of a subject was the sum of his performance (the “subscore”) in a real-effort task and an idiosyncratic random number. The task was an encryption task, as in Erkal *et al.* (2011) and Charness *et al.* (2014). It consisted of decoding letters into numbers within 30 seconds with the help of a correspondence table displayed on the computer screen. In our design, each problem was composed of several letters. Subjects had to enter the corresponding number and to validate their answer. They received immediate feedback on whether their answer was correct or not. If the answer was not correct, they had to enter a new number. If the answer was correct, other letters were displayed on the screen. The subscore for the period was the total number of correct answers provided within 30 seconds.

Once the 30 seconds had elapsed, subjects were informed both of their own subscore and of their opponent's subscore. Then, the program drew two random numbers independently from a uniform distribution in the interval  $[-5, 5]$ , one for the subject and one for his opponent, with rebate between the two draws. These numbers could represent the environmental conditions in which the task had to be performed (think, for example, of the number of clients standing in line in a supermarket, which affects the productivity of cashiers). Subjects were informed of these two numbers. The rest of the period depended on the condition.

In the Self-condition, subjects had to report their own random number in the computer.<sup>6</sup> In the Opp-condition, they had to report instead their opponent's number.<sup>7</sup> Subjects who were willing to increase their chance of winning the prize had the opportunity to misreport their own or their opponent's random number, depending on the condition. In the instructions, nothing was mentioned about this possibility. The reported number was added to the subscore to determine the final score.

Finally, the outcome of the contest was computed according to equation (1), and subjects were informed whether or not they won the prize. They were only reminded of their final score in the Self-condition or their opponent's final score in the Opp-condition. Indeed, to avoid the contamination of lying and blind revenge, players were not informed whether their own number was reported truthfully or not in the Opp-condition, or whether the opponent misreported his own number or not in the Self-condition. In no condition did they learn the distance between their own final score and their opponent's final score. To determine the subjects' earnings in this part, two periods (one in each condition) were randomly selected at the end of the session, and the payoffs in these periods were added up.

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<sup>6</sup> Think, for example, of an employee evaluation interview with his manager during which he explains under which environmental conditions he had to perform his task.

<sup>7</sup> In keeping with the same example, during the evaluation interview the employee can compare his working conditions with those of his fellow workers.

### *Belief Elicitation*

Some subjects may misreport because of their preference or because they believe that their opponent will not report truthfully (*e.g.*, López-Pérez and Spiegelman, 2013). At the end of the contest game, we elicited the subjects' beliefs about the frequency of misreports in previous sessions. Subjects were presented two scenarios based on the same contest game. In the first scenario, two participants, A and B, have to report their own random number, with participant A having a higher subscore than participant B. Subjects had to indicate how many A participants among 10 and how many B participants among 10 randomly selected in previous sessions they thought misreported their random number. In the second scenario, participants A and B have to report their opponent's number. Similarly, subjects had to indicate how many A participants among 10 and how many participants B among 10 they thought misreported the random number of their opponent. One of these four guesses was randomly selected for payment. A correct guess paid 100 ECUs.

### *Online Questionnaire on Social Preferences*

Since the outcome of the contest leads to very unequal payoffs, the players' social preferences may have affected their behavior in our experiment. Therefore, about a week prior to the session in the laboratory, subjects had to fill out an incentivized online questionnaire. The main part of this questionnaire consisted of the Social Value Orientation (SVO) test of Murphy *et al.* (2011). In this test subjects faced six decisions successively. Each decision consisted of choosing an allocation of ECUs between himself and another participant among nine options. Figure A1 in Appendix 3 shows the first decision in the test. For this decision, the first option offered an equal split (85 ECUs for oneself and for the other), and the degree of inequality increased between the second and the ninth option (up to 85 ECUs for oneself and 15 ECUs for the other). The other five decisions had the same structure. The subject's six

decisions allowed us to compute an index, called the SVO angle, for each subject.<sup>8</sup> The lower this index is, the less pro-social the subject is. Based on the value of this index, we divided subjects into two categories: the “pro-self” subjects were those with a SVO angle equal to or lower than  $22.5^\circ$  (103 subjects, 53.65% of the total sample), and the “pro-social” subjects were those with a SVO angle higher than  $22.5^\circ$  (89 subjects, 46.35% of the sample).

At the beginning of the questionnaire, subjects were informed that one of their six decisions would be randomly selected and that they would be matched twice with another subject participating in the same laboratory session. In the first matching, the subject was paid the amount he allocated to himself and the matched partner was paid the amount the subject allocated to the other. In the second matching, the subject was paid according to the choice made by the matched partner for the other and this matched partner received the amount he allocated to himself. Feedback on the earnings in this task was given only at the end of the lab session.

In addition to the SVO test, subjects had to answer ten questions taken from the risk-elicitation questionnaire by Weber *et al.* (2002) with no other objective than diverting the subjects’ attention from the elicitation of social preferences in the experiment.

### 2.1.2. Identity Treatment

The Identity treatment was similar to the No-Identity treatment, except that group identity was induced prior to the contest game. The identity induction part was composed of three stages, as described by Chen and Li (2009). The first two stages aimed at inducing identity, while the third one served to assess the validity of identity manipulation.

In the first stage, subjects had to review five pairs of paintings by Klee and Kandinsky. Without receiving any clue about the painters, they reported their preferred painting in each

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<sup>8</sup> We compute the mean allocation that the subject chose for himself and the mean allocation he chose for the other. Then, we subtract 50 from each of these means. Finally, the inverse tangent of the ratio between these means is computed, resulting in the SVO index.

pair. According to their preferences toward one or another painter, they were split into two groups, the “Klee group” and the “Kandinsky group”. Unlike Chen and Li (2009), we formed groups of equal size to get a balanced matching in the contests. Subjects with the weakest preference toward one artist or another were switched into the other group, if needed. The whole procedure was made common knowledge. Subjects were privately informed of their group affiliation.

In the second stage, subjects had to review two additional paintings and they were asked to identify which artist painted each of them. Before entering their answers individually, they had the opportunity to participate in a chat discussion over eight minutes, exclusively with their group members. The aim was to reinforce the feeling of belonging to a group, since the chat allowed group members to help each other. Each correct answer paid 50 ECUs.

The third stage consisted of five periods of a third-party allocation task. Subjects had to share a number of ECUs between two anonymous participants. They were not allowed to allocate ECUs to themselves. The objective was to identify in-group favoritism in the allocation decisions. From the first period up to the fifth, the number of ECUs to be allocated increased from 50 to 250 by increments of 50 ECUs. In each period, subjects were presented three scenarios. In the first scenario, the two participants shared the same group identity as the decision-maker. In the second scenario, the two participants belonged to the other group. In the third scenario, one participant belonged to the same group and the other one belonged to the other group.<sup>9</sup>

After completion of the third stage, subjects played the contests. The rules were the same as in the No-Identity treatment, except that subjects were informed of the group identity of their opponent at the beginning of the sequence. In half of the 16 periods, subjects faced an

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<sup>9</sup> The procedure for payment followed Chen and Li (2009). We generated a random sequence of ID numbers. Subjects allocated ECUs between the two participants whose ID directly followed their own ID in the sequence. Accordingly, a subject’s payoff was the sum of the ECUs allocated to him by the two people whose ID preceded him in the sequence.

opponent from their group (Same Group, or “SG pairs” hereafter). In the other half, they faced an opponent from the other group (Other Group, or “OG pairs” hereafter). Thus, the Identity treatment included four sets of four periods: SG pairs in the Self-condition, SG pairs in the Opp-condition, OG pairs in the Self-condition and OG pairs in the Opp-condition. The order between these four conditions was random across periods.

Finally, at the end of the session we elicited beliefs. Like in the other treatment, subjects had to guess how many A and B participants out of 10 drawn from past sessions misreported in four scenarios. In this treatment, in two scenarios A and B shared the same group identity, and in the two other scenarios they belonged to different groups.

## *2.2. Procedures*

The experiment was conducted at GATE-Lab, Lyon (France). 192 subjects were recruited using HROOT (Bock *et al.*, 2014). 77.60% of the subjects were students from local engineering, business, and medical schools. We conducted four sessions of the No-Identity treatment with 64 subjects and eight sessions of the Identity treatment with 128 subjects. Table A1 in Appendix 2 summarizes the participants’ characteristics, with no significant difference between treatments.

The online questionnaire was programmed with LimeSurvey (Limesurvey GmbH) and the laboratory experiment with Z-tree (Fischbacher, 2007). In the lab sessions, instructions were distributed to the subjects and read aloud (see Appendix 1). In the Identity treatment we first distributed the instructions describing the first two stages of the group identity induction procedure. The instructions for the third stage were distributed only after these two stages were completed. The instructions used neutral language. Those for the belief elicitation were displayed directly on the screens at the end of the contest game.

Sessions lasted on average 70 minutes for the No-Identity treatment and 90 minutes for the Identity treatment. Someone who was not aware of the content of the experiment paid

participants in private in a separate room. This was made clear in the instructions. ECUs were converted into Euros, at the rate of 100 ECUs to €2.50. Mean earnings were €19.29 (SD=1.78), including a €5 show-up fee and an average €1.57 (SD=0.52) for the online task.

### **3. Behavioral Conjectures**

Since by design there is no monetary cost for lying, individuals who are willing to maximize their earnings and have no moral cost for lying should misreport to the full extent to maximize their probability of winning the contest, regardless of their performance at the task and of their random number. In contrast, individuals who suffer a finite moral cost from lying should be less likely to misreport or should misreport only partially, and those who endure an infinite cost of lying should never misreport. This conjecture relies on the recent literature on lying (*e.g.*, Mazar *et al.*, 2008; Fischbacher and Föllmi-Heusi, 2013; Gibson *et al.*, 2013; Kajackaite and Gneezy, 2017; Abeler *et al.*, 2016; see Irlensbush and Villeval, 2015, for a survey) showing that dishonesty is usually partial.

In contexts in which they have to report performance or outcomes, individuals who are willing to maximize their payoffs should misreport to the same extent (albeit not in the same direction) their outcome and the outcome of their opponent. However, Rigdon and D'Esterre (2015) have found evidence that individuals misreport more their own performance than the performance of another person, in both competitive and noncompetitive settings (see also Charness *et al.*, 2014). Similarly, we conjecture that in our experiment subjects are more likely to overreport their own number than underreport their opponent's number, because harming directly another person may be perceived as aggressive. We summarize our first conjecture as follows:

*Conjecture 1 (Misreporting):* (a) Subjects misreport both their own number and their opponent's number; and (b) they are more likely to overreport their number than underreport the opponent's number.

Previous literature has shown that people who identify with a social group tend to favor their in-group members in terms of cooperation, trust and reciprocity compared to out-group members (Goette *et al.*, 2006; Charness *et al.*, 2007; Chen and Li, 2009). In-group favoritism can come with out-group aggressiveness even without any strategic consideration (parochial altruism) (Abbink *et al.*, 2012; Goette *et al.*, 2012; Kolmar and Wagener, 2012). Accordingly, we anticipated that the moral cost of lying in our experiment would be higher when the victim of the lie was in the in-group, and lower when the victim was in the out-group. Therefore, we expected subjects to be less likely to misreport when they were paired with an in-group member (or more with an out-group member) in the Identity treatment, especially in the Opp-condition.

Finally, in-group favoritism can originate from two main channels: preferences and beliefs about how others will behave. Previous studies on group identity and distributive choices (*e.g.*, Yamagishi and Mifune, 2008; Güth *et al.*, 2009; Ockenfels and Werner, 2014), or cooperation (Guala *et al.*, 2013), tended to favor the role of beliefs. Based on these previous results, we conjectured that in our experiment subjects would believe that in-group opponents would be less likely to lie than out-group opponents. As a result, and regardless of their preferences, they would deceive less when matched with an in-group member and more when matched with an out-group member. Thus, we conjectured that pairs composed of in-groups would be less likely to misreport (or more if composed of out-groups). Our second conjecture was the following:

*Conjecture 2 (Social identity and misreporting): (a) When facing an in-group opponent, subjects misreport less than when facing an out-group opponent, especially in the Opp-condition; and (b) differentiated beliefs about the opponent's behavior according to his group identity are correlated with reporting behavior.*



## 4. Results

We start by presenting general results on reporting behavior under the different conditions.

Next, we analyze the impact of group identity on misreporting. Finally, we examine the relationship between the subjects' beliefs and their reporting behavior.

### 4.1. Misreporting behavior across conditions

We introduce our first result:

*Result 1:* (a) More than half of the subjects misreport self-interestedly at some point, and those who misreported did it to the full extent most of the time. (b) They misreported to the same extent and with the same frequency when they reported for themselves (Self-condition) or for their opponent (Opp-condition).

Result 1 gives some support to Conjecture 1a but rejects Conjecture 1b.

*Support for Result 1.* Figures 1A and 1B display the distribution of numbers reported by the subjects in the Self-condition and in the Opp-condition, respectively, by treatment.

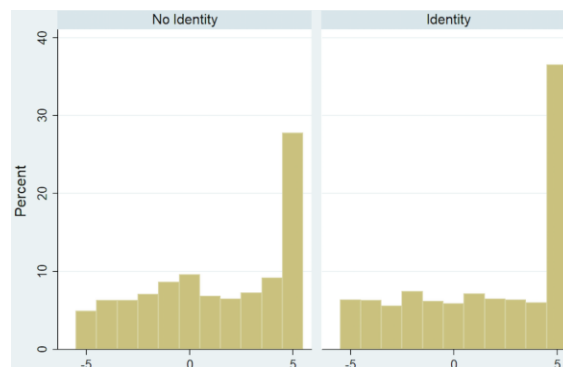


Figure 1A. Distribution of numbers reported in the Self-condition, by treatment

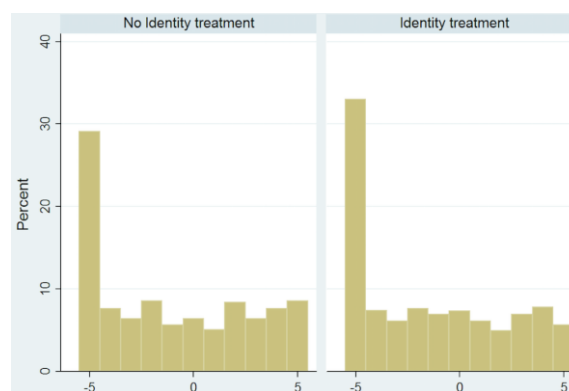


Figure 1B. Distribution of numbers reported in the Opp-condition, by treatment

In each condition, each number is expected to appear uniformly 9.09% of the time if reports are truthful. Figures 1A and 1B suggest that the distribution of reported numbers is

different from a uniform distribution in both conditions and treatments.<sup>10</sup> The frequency of 5s reported in the Self-condition was 27.73% in the No-Identity treatment, and 36.52% in the Identity treatment; conversely, the frequency of -5s reported in the Opp-condition was 29.10% and 33.01%, respectively.<sup>11</sup> This provides evidence of self-interested misreporting.

Our protocol allows us to precisely identify precisely misreports. A (small) majority of subjects told selfish lies. 103 subjects out of 192 (53.65%) misreported self-interestedly at least once during the 16 periods. Among these subjects, 77 misreported at least once in each of the two conditions (40.10%), 12 subjects misreported only in the Self-condition (6.25%), and 14 subjects only in the Opp-condition (7.29%).

Table 1 displays the absolute and relative frequencies of misreports, their average intensity in absolute values, and the absolute and relative frequencies of full misreports, by treatment and condition.<sup>12</sup> Intensity is defined as the difference between the reported random number and the actual number. “Full misreport” consists of reporting the highest possible number for oneself or the lowest possible number for the opponent. This table includes only selfish misreports (those increasing the subject’s probability of winning) and Table A2 in Appendix 2 displays the same information on misreports in which a subject underreported his own number or overreported his opponent’s number.

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<sup>10</sup> For the non-parametric tests reported in the paper, we considered only the first of the 16 periods, the only one in which observations were truly independent. Each subject was taken as one independent observation. Tests were two-sided.  $\chi^2$  goodness-of-fit tests rejected the uniform distribution in the Identity treatment ( $p < 0.001$  for the Self-condition and  $p = 0.027$  for the Opp-condition), but not in the No-Identity treatment ( $p > 0.10$  in both conditions).

<sup>11</sup> Binomial tests on the first period indicate that these numbers are significantly different from 9.09% in both the Self- ( $p < 0.001$ ) and the Opp-condition ( $p = 0.001$ ) in the Identity treatment and in the Opp-condition in the No-Identity treatment ( $p = 0.076$ ); the number of 5s reported in the Self-condition in the No-Identity treatment is not significantly different from 9.09% ( $p = 0.658$ ).

<sup>12</sup> In Table 1 and the following tables and tests about selfish lies, we exclude the cases in which subjects could not misreport selfishly (their number was equal to 5 in the Self-condition and their opponent’s number was equal to -5 in the Opp-condition).

Table 1. Frequency and intensity of selfish misreporting, by treatment and condition

Treatment	Condition		Absolute (relative) frequency of misreports	Average absolute intensity of misreports	Absolute (relative) frequency of full misreports
No- Identity	Self	All	131/476 (27.52%)	5.32 (0.25)	110/131 (83.97%)
	Opp	All	120/438 (27.40%)	4.92 (0.26)	102 /120 (85.00%)
Identity	Self	All	296/912 (32.46%)	5.29 (0.17)	269/296 (90.88%)
		In-Group opponent	140/458 (30.57%)	5.21 (0.24)	127/140 (90.71%)
		Out-Group opponent	156/454 (34.36%)	5.36 (0.24)	142/156 (91.02%)
	Opp	All	285/908 (31.39%)	5.45 (0.17)	248/285 (87.02%)
		In-Group opponent	142/452 (31.42%)	5.86 (0.23)	123/142 (86.62%)
		Out-Group opponent	143/456 (31.36%)	5.05 (0.25)	125/143 (87.41%)

Note: Standard deviations are in parentheses.

If a majority of subjects lie, Table 1 shows that they misreported selfishly less than two-thirds of the time in all treatments and conditions. In the No-Identity treatment, 27% of the subjects reported a higher number for themselves and the same percentage reported a lower number for their opponent when they had an opportunity to lie. In the Identity treatment, 32% and 31% of the subjects misreported in the Self- and in the Opp-condition, respectively. But subjects who lie selfishly misreport to the full-extent in the vast majority of cases (from 84% to 91% of the observations, depending on the treatment and condition). This result is consistent with those of Kajackaite and Gneezy (2017): as the experimenter is able to observe misreporting (ex post facto), those with a higher moral cost of lying may misreport to a lesser extent than if there were no scrutiny at all, but those who are willing to misreport have no reluctance to lie in full.

Table A2 in Appendix 2 shows that non-self-interested misreports were very rare. In 11 cases (emanating from 10 different subjects and representing 0.79% of the relevant observations) subjects underreported their own number; in 53 cases (emanating from 33 different subjects and representing 3.81% of the cases), they overreported their opponent's

number. These cases are either errors or altruistic white lies motivated by the willingness to increase the opponent's chance to succeed. We favor the first interpretation because most subjects made these types of reports only once or twice.<sup>13</sup> The rest of our analysis is based only on self-interested misreporting.

To compare the decision to misreport selfishly across conditions, we first report proportion tests based on the first period and the cases in which the subject had an opportunity to lie. These tests show no statistically significant difference between decisions in the Self- and the Opp-conditions in the No-Identity treatment ( $N=50$ ,  $p=0.214$ ) and in the Identity treatment ( $N=93$ ,  $p=0.634$ ). Next, we report a regression analysis that investigates the determinants of misreporting behavior, considering first the decision to misreport or not, and second the intensity of misreports. The results are shown in Tables 2 and 3.

Table 2 displays the marginal effects of seven random-effects probit models in which the dependent variable is the decision to misreport, with robust standard errors. These models vary the conditions and treatments included. Models (1) to (3) pool the decisions made in the two conditions. Models (4) and (5) consider the decisions made in the Self-condition and models (6) and (7) those made in the Opp-condition. Models (2), (4), and (6) include only the No-Identity treatment, and models (3), (5), and (7) only the Identity treatment.

In model (1), the independent variables include dummy variables for the Identity treatment and for the Opp-condition, taking the Self-condition and the No-Identity treatment as the reference categories. Since the decision to misreport may be affected by the relative performance at the task, they also include the subject's subscore, the difference between subscores when the subject outperforms his opponent ( $\max\{0, \text{subscore}_{i,t} - \text{subscore}_{j,t}\}$ ), the difference between subscores when the subject is outperformed by his opponent ( $\max\{0, \text{subscore}_{j,t} - \text{subscore}_{i,t}\}$ ), and a dummy in case of a tie in performance. Since the decision to

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<sup>13</sup> One subject overreported the opponent's number in seven out of eight cases and underreported his own number in two out of eight cases. But he also overreported his own number in four cases. His comments left in the postexperimental questionnaire suggest that the subject was confused.

misreport may also be affected by relative luck, the independent variables include the subject's random number, the difference between the subject's and his opponent's numbers when the subject is luckier than his opponent ( $\max\{0, \text{number}_{i,t} - \text{number}_{j,t}\}$ ), the difference between numbers when the subject is less lucky than his opponent ( $\max\{0, \text{number}_{j,t} - \text{number}_{i,t}\}$ ), and a dummy in case of a tie. To control for a possible nonlinear evolution of behavior over time, we added a time trend and its squared value. We included the subject's gender and a dummy variable indicating whether the subject was classified as pro-self *vs.* pro-social in the SVO test. The other individual characteristics include the subject's age and his number of past participations in a laboratory experiment. Finally, session fixed effects control for unobserved heterogeneity across sessions.

The other models include the same independent variables, except the condition and treatment variables. In addition, models (3), (5), and (7) include a dummy variable for in-group *vs.* out-group matching.

As a complement to Table 2, Table 3 reports the marginal effects from seven random-effects Tobit regressions on the intensity of misreporting, as data are censored on the left when subjects report honestly (*i.e.*, the intensity is null). These models have the same characteristics as those reported in Table 2.

Table 2. Determinants of selfish misreporting decisions

<i>Dependent variable: Selfish misreport</i>	All conditions			Opp-condition		Self-condition	
	All (1)	No-Identity (2)	Identity (3)	No-Identity (4)	Identity (5)	No-Identity (6)	Identity (7)
Identity treatment	-0.055 (0.147)	-	-	-	-	-	-
Opp-condition	-0.011 (0.014)	-0.003 (0.029)	-0.012 (0.044)	-	-	-	-
In-group opponent	-	-	-0.027 (0.100)	-	-0.023 (0.023)	-	-0.037 (0.040)
Subscore $i_t$	0.016** (0.008)	0.027* (0.015)	0.010 (0.046)	0.047** (0.020)	0.003 (0.011)	0.025 (0.022)	0.011 (0.031)
Tie: $\text{subscore}_{i,t} = \text{subscore}_{j,t}$	0.024 (0.022)	-0.023 (0.039)	0.051 (0.198)	-0.070 (0.050)	0.055 (0.036)	0.004 (0.059)	0.047 (0.081)
$\text{Max}\{0, \text{subscore}_{i,t} - \text{subscore}_{j,t}\}$	-0.007 (0.008)	-0.003 (0.016)	-0.007 (0.030)	-0.015 (0.018)	-0.007 (0.011)	-0.001 (0.020)	-0.002 (0.012)
$\text{Max}\{0, \text{subscore}_{j,t} - \text{subscore}_{i,t}\}$	0.020** (0.008)	0.039** (0.016)	0.012 (0.049)	0.039** (0.018)	0.010 (0.013)	0.036 (0.029)	0.015 (0.036)
Random number $i_t$	0.002 (0.003)	-0.006 (0.006)	0.005 (0.022)	0.018* (0.010)	0.010 (0.007)	-0.039*** (0.010)	-0.004 (0.006)
Tie: $\text{number}_{i,t} = \text{number}_{j,t}$	-0.005 (0.025)	-0.003 (0.056)	-0.002 (0.031)	-0.012 (0.087)	0.022 (0.034)	0.085 (0.063)	-0.010 (0.035)
$\text{Max}\{0, \text{number}_{i,t} - \text{number}_{j,t}\}$	-0.016*** (0.006)	-0.011 (0.010)	-0.017 (0.065)	-0.007 (0.013)	-0.018* (0.010)	0.013 (0.014)	-0.004 (0.007)
$\text{Max}\{0, \text{number}_{j,t} - \text{number}_{i,t}\}$	0.010*** (0.003)	0.011* (0.006)	0.009 (0.034)	0.026*** (0.009)	0.016 (0.010)	-0.001 (0.009)	0.002 (0.006)
Period	0.023*** (0.009)	0.033* (0.017)	0.020 (0.070)	0.040* (0.024)	0.022* (0.014)	0.014 (0.020)	0.015 (0.015)
Period squared	-0.001* (0.000)	-0.001 (0.001)	-0.001 (0.002)	-0.002 (0.001)	-0.001 (0.001)	-0.000 (0.001)	-0.001 (0.001)
Pro-self (SVO)	0.171*** (0.056)	0.217** (0.098)	0.124 (0.090)	0.214** (0.105)	0.117 (0.082)	0.151 (0.111)	0.147 (0.192)
Male	0.172***	0.186**	0.164	0.180*	0.157	0.161	0.155

	(0.064)	(0.091)	(1.054)	(0.096)	(0.186)	(0.115)	(1.045)
Other individual characteristics	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Session fixed effects	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Number of observations	2487	838	1649	438	908	476	912
Number of subjects	192	64	128	64	128	64	128
Pseudo-loglikelihood	-633.580	-257.578	-363.482	-147.611	-233.157	-158.366	-223.594
Wald chi2	99.33	60.816	93.356	55.75	81.02	40.60	63.76
$p > \chi^2$	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001

*Notes:* This Table reports marginal effects from random-effects probit regressions with robust standard errors in parentheses. \*\*\* indicates significance at the 1% level, \*\* at the 5% level, and \* at the 10% level.

Table 3. Determinants of the intensity of selfish misreporting

<i>Dependent variable:</i> Intensity of selfish misreport	All conditions			Opp-condition		Self-condition	
	All (1)	No-Identity (2)	Identity (3)	No-Identity (4)	Identity (5)	No-Identity (6)	Identity (7)
Identity treatment	-0.173 (0.301)	-	-	-	-	-	-
Opp-condition	-0.029 (0.024)	-0.053 (0.055)	-0.015 (0.026)	-	-	-	-
In-group opponent	-	-	-0.014 (0.025)	-	-0.021 (0.030)	-	-0.042 (0.028)
Subscore <sub>i,t</sub>	0.014 (0.013)	0.027 (0.028)	0.009 (0.014)	0.064* (0.039)	0.025 (0.017)	0.056 (0.038)	0.014 (0.015)
Tie: subscore <sub>i,t</sub> = subscore <sub>j,t</sub>	0.089** (0.040)	-0.002 (0.087)	0.117*** (0.044)	-0.102 (0.122)	0.070 (0.051)	0.045 (0.108)	0.066 (0.045)
Max {0, subscore <sub>i,t</sub> - subscore <sub>j,t</sub> }	0.008 (0.013)	0.027 (0.028)	-0.002 (0.015)	-0.014 (0.040)	-0.025 (0.018)	0.016 (0.033)	-0.010 (0.016)
Max {0, subscore <sub>j,t</sub> - subscore <sub>i,t</sub> }	0.055*** (0.017)	0.113*** (0.038)	0.033* (0.017)	0.084* (0.049)	0.020 (0.021)	0.107** (0.050)	0.022 (0.019)
Random number <sub>i,t</sub>	-0.003 (0.006)	-0.014 (0.014)	0.001 (0.006)	0.099*** (0.023)	0.101*** (0.015)	-0.135*** (0.027)	-0.087*** (0.014)
Tie: number <sub>i,t</sub> = number <sub>j,t</sub>	0.010	-0.026	0.034	0.047	0.102	0.159	-0.005

Max{0, number <sub>i,t</sub> - number <sub>j,t</sub> }	(0.048)	(0.103)	(0.052)	(0.144)	(0.064)	(0.132)	(0.059)
	-0.051***	-0.049**	-0.049***	-0.086***	-0.105***	0.028	0.001
Max{0, number <sub>j,t</sub> - number <sub>i,t</sub> }	(0.010)	(0.020)	(0.012)	(0.025)	(0.016)	(0.020)	(0.009)
	0.057***	0.059***	0.055***	0.134***	0.120***	0.014	0.009
Period	(0.008)	(0.015)	(0.009)	(0.026)	(0.017)	(0.016)	(0.008)
	0.052***	0.076**	0.043***	0.115***	0.040**	-0.002	0.037**
Period squared	(0.014)	(0.030)	(0.016)	(0.042)	(0.018)	(0.036)	(0.016)
	-0.002***	-0.003*	-0.001**	-0.005**	-0.001	0.001	-0.001
Pro-self (SVO)	(0.001)	(0.001)	(0.0008)	(0.002)	(0.001)	(0.002)	(0.001)
	0.388***	0.528**	0.270*	0.585**	0.264	0.371	0.291*
Male	(0.136)	(0.236)	(0.163)	(0.265)	(0.178)	(0.262)	(0.167)
	0.323**	0.432*	0.248	0.485**	0.308*	0.376	0.213
Other individual characteristics	(0.130)	(0.225)	(0.157)	(0.248)	(0.173)	(0.250)	(0.159)
Session fixed effects	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Number of observations	2487	838	1649	438	908	476	912
Number of left censored observ.	1737	613	1124	318	623	345	616
Number of subjects	192	64	128	64	128	64	128
Pseudo-loglikelihood	-2501.927	-816.412	-1671.104	-431.356	-870.746	-463.723	-915.907
Wald Chi2	416.56	136.76	294.99	113.20	450.05	136.35	370.26
<i>p</i> >chi2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

*Notes:* This Table reports marginal effects from random-effects Tobit regressions with standard errors in parentheses. \*\*\* indicates significance at the 1% level, \*\* at the 5% level, and \* at the 10% level.



Contrary to Conjecture 1b, models (1) to (3) in both Table 2 and Table 3 show that neither the probability nor the intensity of misreporting differ significantly between the Self- and the Opp-conditions in any treatment.

However, the two tables indicate that the determinants of behavior differ across conditions, suggesting that subjects did not focus exactly on the same information. In the Self-condition, the likelihood of misreporting (only in the No-Identity treatment) and the intensity of misreporting react mainly to bad luck with one's number (models (6) and (7)). In the No-Identity treatment, the intensity of misreporting increases also with the performance spread when the subject is lagging behind. In contrast, in the Opp-condition, the higher one's performance and one's luck, the higher the likelihood (in the No-Identity treatment) and the intensity of misreports (in both treatments), as if to protect one's chance to win (see models (4) and (5)). The probability to misreport the opponent's number and the intensity of misreporting are also both significantly higher the more the opponent is ahead either in terms of performance (in the No-Identity treatment) or in terms of luck. Leading with a larger spread in numbers reduces the intensity of misreporting. Moreover, the subjects are significantly more likely to misreport their opponent's number over time and to a larger extent, whereas no clear time pattern can be discerned in the Self-condition, possibly because individuals have originally more scruples about sabotaging others. More generally, we observe an increase in the intensity of lying with the repetition of the game, which is consistent with the escalation of self-serving dishonesty reported by Garrett *et al.* (2016).

Finally, selfishness, as measured by the pro-self category in the SVO test, and being a male tend to increase the likelihood and the intensity of misreporting, but this is not systematically significant (and almost never significant in the Self-condition).

#### *4.2. Group Identity and Misreporting Behavior*

We next present our main finding regarding the impact of group identity:

*Result 2:* Group identity has no significant impact on the willingness to misreport and on the intensity of misreporting, regardless of the condition.

This rejects Conjecture 2a.

*Support for Result 2:* First, to validate our group identity induction, we test whether subjects exhibit in-group favoritism in the other-other allocation task (scenario 3) in the third stage of the procedure. In this scenario, they had to decide as a third party how to share a certain amount of ECUs between person A (in their in-group) and person B (in their out-group). The amount to share increased by increments of 50 ECUs across periods. Figure 2 displays the average allocation of ECUs in each of the five periods.

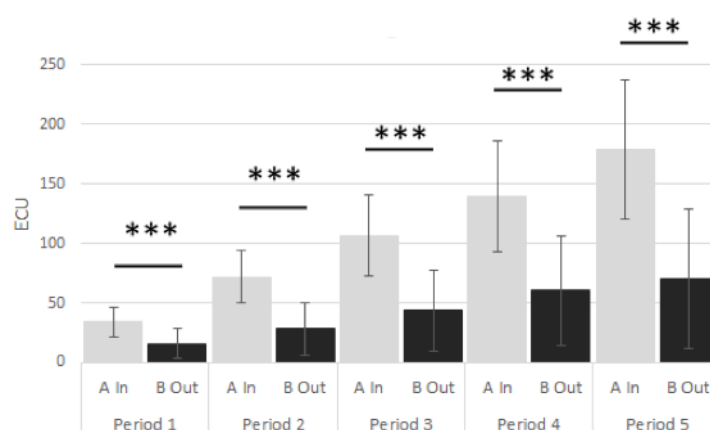


Figure 2. Average allocation in ECU as a third-party in scenario 3, by period (stage 3 of the group identity induction procedure)

*Notes:* “In” stands for in-group and “Out” for out-group. In scenario 3, person A is an in-group member and B is an out-group member. \*\*\* indicates significance at the 1% level in two-sided pair-wise *t*-tests.

In this task, subjects favored in-groups and discriminated against out-groups. When pooling all the data, we find that they allocated 2.68 times more to an in-group member (106.33 ECUs) than to an out-group member (39.67 ECUs) (two-sided pairwise *t*-test,  $p < 0.001$ ). As seen in Figure 2, the difference is significant in each period. Importantly, in the two other scenarios the allocations differed significantly neither when both persons A and B were from the same group as the subject (scenario 1), and when both were from the other group (scenario 2) (see Figure 2A in Appendix 3). This shows that the induction of group identity was successful.

Although subjects expressed in-group favoritism in this task, we found no significant difference in the decisions to misreport between the No-Identity and the Identity treatments, regardless of the condition. This is supported by the regressions reported in Tables 2 and 3. First, in models (1), the Identity treatment variable is not significant. Second, in models (3), (5), and (7) relative to the Identity treatment, being matched with an in-group did not affect misreporting differently than being matched with an out-group. Finally, comparing models (2) and (3), (4) and (5), or (6) and (7) shows similar patterns in the intensity of misreporting in the Identity and the No-Identity treatments (Table 3), but it does show less significant variables in the Identity treatment compared to the No-Identity treatment regarding the probability to misreport (Table 2).<sup>14</sup>

Overall, this suggests that in such a competitive environment, a competitor is first seen as an opponent, and the social distance with him in terms of group identity is not perceived as a relevant characteristic leading one to change one's norm of behavior.

#### *4.3. Beliefs*

We introduce our last result:

*Result 3:* Individuals believe that group identity affects others' misreporting behavior, although they are not themselves influenced by the group identity of their opponent.

This does not support Conjecture 2b.

*Support for Result 3.* We did not elicit the subjects' beliefs about their opponent's misreporting behavior in each period to avoid biasing their behavior. Instead, beliefs were elicited at the end of the session by asking subjects to guess how many people among 10 participants randomly selected in past sessions misreported in scenarios corresponding to the Self- and to the Opp-conditions, depending on whether the participant's subscore was above or below that of his

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<sup>14</sup> The fact that in Table 2 almost none of the independent variables are significant in the Identity treatment is not driven by significant effects of opposite signs between observations corresponding to in-group matching and observations corresponding to out-group matching that would cancel out. Re-estimating models (3), (5), and (7) on the subsamples of pairs sharing the same group identity and pairs with different group identities shows qualitatively the same results as in the models pooling both types of matches.

opponent. Thus, subjects reported four beliefs in the No-Identity treatment and eight beliefs in the Identity treatment, since in the latter treatment we distinguished beliefs about pairs of in-groups and beliefs about pairs of out-groups. Note that at the end of the session, subjects were not informed whether their opponents lied or not during the contests.

Table 4 reports OLS regressions in which the dependent variable is the individual's reported belief in the different scenarios. Robust standard errors are clustered at the individual level. Model (1) pools the data from both treatments and includes a control for the Identity treatment, while models (2) to (4) consider only the No-Identity treatment and models (5) to (7) only the Identity treatment. To correlate beliefs with behavior in the contest game, models (3) and (6) are restricted to the sub-sample of subjects who never misreported in this game and models (4) and (7) to the sub-sample of subjects who misreported at least once.

In all models, the independent variables include a dummy equal to 1 if the belief is about the Self-condition scenario ("Reporting for the Self scenario"), and 0 if it is about the Opp-condition scenario. "Higher subscore player" is equal to 1 if the belief is about the player with a higher subscore, and 0 if it is about the player with a lower subscore. Finally, we control for the same individual characteristics as in the previous tables. In the models relative to the Identity treatment, the independent variables include also an "In-group pair" dummy equal to 1 if the belief is about two participants who shared the same group identity, and 0 if it is about participants with differing group identities.

Table 4 shows that subjects believe that people lied less when ahead of their opponent in terms of performance (models (1), (5), and (7)) and that they lied more about their own number than about their opponent's number (model (1)). This is mainly driven by subjects who themselves misreported in the Identity treatment (model (7)). Finally, and regardless of whether they lied in the game or not, subjects believe that fewer people misreported when paired with someone from the same group (models (5) to (7)).

Table 4. Determinants of beliefs on misreporting decisions in past sessions

<i>Dependent variable: Belief about the number of players who misreported</i>	All subjects (1)	No-Identity treatment			Identity treatment		
		All subjects (2)	Subjects who never misreported (3)	Subjects who misreported (4)	All subjects (5)	Subjects who never misreported (6)	Subjects who misreported (7)
Identity treatment	-0.682 (0.980)	-	-	-	-	-	-
Reporting for Self scenario	0.333** (0.137)	0.133 (0.225)	0.220 (0.459)	0.077 (0.243)	0.383** (0.162)	0.211 (0.217)	0.555** (0.245)
Higher subscore player	-0.380** (0.152)	-0.352 (0.364)	0.100 (0.701)	-0.641 (0.413)	-0.387** (0.168)	0.211 (0.243)	-0.984*** (0.213)
In-group pair	-	-	-	-	-0.426*** (0.096)	-0.398*** (0.143)	-0.453*** (0.132)
Pro-self (SVO)	0.707 (0.431)	0.641 (0.628)	-0.083 (0.878)	0.539 (0.667)	0.759 (0.532)	-0.618 (0.646)	1.055* (0.620)
Male	0.535 (0.458)	-0.653 (0.661)	-0.503 (0.779)	-0.540* (0.762)	0.900 (0.546)	0.189 (0.615)	1.074 (0.652)
Other individual characteristics	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Session fixed effects	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Constant	3.555*** (0.930)	6.420*** (1.120)	3.657*** (1.303)	8.690*** (1.039)	2.788*** (1.009)	1.726 (1.185)	3.970* (2.264)
Nb of obs.	1280	256	100	156	1024	512	512
Nb of subjects	192	64	25	39	128	64	64
R2	0.052	0.057	0.098	0.186	0.071	0.121	0.187
<i>p</i> >F	0.095	0.253	0.114	0.002	<0.001	<0.001	<0.001

Notes: The Table reports OLS regressions with robust standard errors clustered at the individual level in parentheses. \*\*\* indicates significance at the 1% level, \*\* at the 5% level, and \* at the 10% level.

Note that in the No-Identity treatment, none of these variables are significant, regardless of the actual behavior of the subjects. In the Identity treatment, these beliefs are consistent with our conjectures but not with the subjects' actual behavior, as seen in the previous subsections. Even if they believed that individuals were less likely to cheat against an in-group, they did not misreport less when they were themselves in this situation: neither preferences nor beliefs led them to compete more fairly against an opponent.

## 5. Discussion and Conclusion

To study unethical behavior in competitive settings, we explored whether social distance from an opponent in terms of group identity and the nature of reporting (about oneself or about the opponent) affect the willingness to cheat to increase one's chance to succeed. First, we found evidence of widespread lying. Less than half of the subjects never misreported, and those who

misreported did it to the full extent most of the time. This goes against the idea of a convex cost of lying (e.g., Mazar *et al.*, 2008; Lundquist *et al.*, 2009; Fischbacher and Föllmi-Heusi, 2013). Recent theoretical models (Dufwenberg and Dufwenberg, 2016; Gneezy *et al.*, 2016; Kholmetski and Sliwska, 2017) have shown that individuals may refrain from reporting the highest outcome because this may look suspicious and alter their reputation *vis-à-vis* others or the experimenter. In contrast, partial lies were not frequent in our experiment. Behavior was more consistent with the notion of a fixed cost of lying under scrutiny (e.g., Kajackaite and Gneezy, 2017). The opponents did not know whether the subjects misreported or not, but lying could be measured *ex post facto* by the experimenter. Individuals suffering a sufficiently high moral loss of utility from reporting an extreme outcome abstained from misreporting, whereas the others lied in full. Moreover, cheaters may have been less reluctant to lie in full in our game since the report determined only a fraction of the final score which itself affected the probability of winning but not directly the actual outcome of the competition. This may weaken the feeling of responsibility.

A second finding is that in both treatments individuals lied with the same frequency and to the same extent when reporting for themselves or for their opponent. They underreported their opponent's outcome as much as they exaggerated their outcome. This contrasts with Rigdon and D'Esterre (2015), who found that people lie less when reporting the performance of another subject than when reporting their own performance. Kajackaite (2016) showed that lying about an outcome determined by luck is morally less costly than lying about an outcome over which one has control. Accordingly, harming another person may bring less guilt to the liar when lying is about an outcome resulting from luck, like in our experiment, than about the outcome of a costly effort, like in Rigdon and D'Esterre (2015). This interpretation would be consistent with the observation that there are differences in social preferences (e.g., Frohlich *et al.*, 2004; Oxoby and Spraggon, 2008), fairness judgments (e.g., Cappelen *et al.*, 2007), and

acceptability of income inequality (Cappelen *et al.*, 2017) depending on whether an individual's situation results from factors under control (skill, effort) or from pure luck.

Finally, the fact that group identity did not affect misreporting in any condition contrasts with our expectation that people would be less likely to lie at the detriment of an in-group, but this contrasts also with the beliefs expressed by the subjects themselves. It also differs from Banerjee *et al.* (2016), who found in the context of castes in India that the lying behavior of people from the dominant category was discriminatory against previous competitors from the backward caste after they learned that they lost the competition. The difference may result from the fact that in our experiment, group identity was minimal and the opportunity to lie was embedded in the contest game, whereas it followed competition in their case. Note that our results are in line with those of Feldhaus and Mans (2014), who found no effect of social identity on lying in a sender-receiver game.

Regarding distributive choices, Guala and Filipin (2013) proposed that group identity has no systematic effect across contexts because it is a heuristic rather than a social preference or a norm. On the other hand, our interpretation is that in the context of repeated competition, the willingness to win, even using dishonest means, is stronger than affiliation. In other words, a competitor, whether socially close or not, is above all an opponent to beat. This does not mean that ethics in organizations is indifferent to the composition of teams in terms of group identity. But the impact of group identity on unethical behavior may be more sensitive to the environment than previously considered. Reinforcing the feeling of group identity to limit the temptation of unethical behavior in a group may not be a successful policy if the incentives at work involve a strong competitive pressure. Therefore, it is important to investigate under which institutional conditions group identity is more, or less, likely to influence unethical practices in organizations.

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## **Appendix 1. Instructions for the No Identity treatment** (translated from French)

Thank you for participating in this experiment on decision making. Please do not communicate with the others participants until the end of the session. In this session, all your decisions are kept anonymous.

During the experiment, the transactions will be made in ECUs (Experimental Currency Units) and not in Euros. All your earnings will be expressed in ECUs. At the end of the experiment, the total amount of ECUs you have earned will be converted into Euros at the following rate:

$$100 \text{ ECUs} = 2.5 \text{ Euros}$$

You will also receive a 5 Euros show-up fee. Your total earnings will be paid to you in cash at the end of the session. The payments will be made privately in a separate room. The other participants will not be informed of your earnings.

The session consists of two parts. You will receive the instructions for the second part after having completed the previous part.

Each of you has completed an online questionnaire before participating in this session. An ID was sent to you by email to keep your answers to this questionnaire anonymous. You will be asked to enter this ID into your computer at the very beginning of the session. Your earnings in this preliminary part have been computed and they will be paid to you at the end of this session.

### **Part 1**

#### **General description**

This part consists of 16 periods in which you will have to perform a task. In each period your task consists in solving problems during 30 seconds. Each problem solved increases your sub-score by one point.

In each period, you are randomly matched with another participant. Thus, it is very unlikely that you are matched with the same participant twice in a row.

At the end of the period, a participant in the pair earns 100 ECUs and the other pair member earns 50 ECUs. Your payoff depends on your final score relative to the final score of the other participant. Your final score consists of two elements: your sub-score plus a random number that you have to report. If your final score is higher than the final score of the other participant, the higher is the difference between your final score and the other participant's final score, the more likely you will get 100 ECUs.

At the end of the session, two periods among the 16 will be randomly selected by the program to compute your earnings in this part.

#### **Description of each period**

A period consists of 4 stages.

- Stage 1: the task

You have to perform a task during 30 seconds. This task consists in decoding letters into numbers. A conversion table is displayed permanently on your screen. After having decoded the letters, you have to press the OK button to validate your answer. You are immediately informed of whether your answer is correct or not. If your answer is incorrect, you have to enter other numbers. The next problem will be displayed only after you have entered a correct answer. If your answer is correct, new letters are displayed and this will continue for 30 seconds. The conversion table changes in each period. It is the same for all the participants.

- Stage 2: matching pairs

The program forms pairs randomly. You are informed about your subscore and the subscore of the other participant. The other participant receives the same information as you.

- Stage 3: final score of the period

Your final score is determined by the sum of your subscore and the reported random number.

The program selects independently a random number for you and a random number for the other participant (with rebate). The random numbers are integers between -5 and 5. You are informed about your random number and the other participant's random number. You have to memorize these numbers because you will be asked to report one of them on the following screen in order to determine your final scores.

Depending on the period, one of the two following cases occurs:

- Case 1: you have to report your own random number. The other participant reports his own random number.
- Case 2: you have to report the random number of the other participant. The other participant has to report your random number.

Once the random numbers have been reported, the program computes your final score and the other participant's final score. The final scores are determined differently in the two cases.

In case 1, your final score is equal to your subscore (the number of problems solved) plus your random number as reported by yourself. The computation is the same for the other participant.

**Case 1:** Your final score = your subscore + your random number as reported by yourself  
Other participant's final score = his subscore + his random number as reported by himself

In case 2, your final score is equal to your subscore (the number of problems solved) plus your random number as reported by the other participant. The computation is the same for the other participant.

**Case 2:** Your final score = your subscore + your random number as reported by the other participant  
Other participant's final score = his subscore + his random number as reported by yourself

- Stage 4: Determination of the payoff of the period

The higher is your final score relative to the final score of the other participant, the more likely you will earn 100 ECUs. The lower is your final score relative to the final score of the other participant, the more likely you will earn 50 ECUs.

More precisely, your chance of winning 100 ECUs is determined as follows:

Your chance of winning 100 ECUs =  $\frac{\text{Your final score}}{\text{Your final score} + \text{other participant's final score}}$

This formula indicates that for your given final score, if the other participant's final score increases, your chance to win 100 ECUs decreases. In contrast, for a given final score of the other participant, if your final score increases, your chance to win 100 ECUs also increases. Your chance to win depends on your final score but also on the final score of the other participant, and the same logic applies to him.

- End of the period

- In case 1, you are informed of your final score. You are not informed of the final score of the other participant.

- In case 2, you are informed of the final score of the other participant, but you are not informed of your final score.

In both cases, you are informed of your payoff, either 50 ECUs or 100 ECUs.

The next period starts automatically. You have to perform the same task and new pairs are formed.

### **Summary**

In each period :

- You solve problems during 30 seconds.
- You are randomly matched with another participant.
- You are informed about your subscore and about the sub-score of this other participant.
- You are informed about your random number and the other participant's random number.
- You report one of the two random numbers, depending on the period.
- You are informed of your payoff and of your final score, or of the final score of the other participant, depending on the period.

### **Part 2**

The instructions for this part will be directly displayed on your screen. If you have questions at this time, do not hesitate to ask questions by raising your hand and/or by pressing the red button.

### **End of the session**

At the end of the session, your screen will display the following information:

- The two periods selected in part 1 and your earnings for this part.
- Your earnings in the second part.
- Your total earnings for the session.

Your earnings for the online part and the show-up fee will be added to the earnings of the session. The payment will be made by someone who does not know the content of the session and has no access to the program and the data.

## **Instructions for the Identity treatment** (translated from French)

Thank you for participating in this experiment on decision making. Please do not communicate with the others participants until the end of the session. In this session, all your decisions are kept anonymous.

During the experiment, the transactions will be made in ECUs (Experimental Currency Units) and not in Euros. All your earnings will be expressed in ECUs. At the end of the experiment, the total amount of ECUs you have earned will be converted into Euros at the following rate:

$$100 \text{ ECUs} = 2.5 \text{ Euros}$$

You will also receive a 5 Euros show-up fee. Your total earnings will be paid to you in cash at the end of the session. The payments will be made privately in a separate room. The other participants will not be informed of your earnings.

The session consists of three parts. You will receive the instructions for each part after having completed the previous part.

Each of you has completed an online questionnaire before participating in this session. An ID was sent to you by email to keep your answers to this questionnaire anonymous. You will be asked to enter this ID into your computer at the very beginning of the session. Your earnings in this preliminary part have been computed and they will be paid to you at the end of this session.

### **Part 1**

At the beginning of this part and for the rest of the session, participants are divided into two groups of equal size. Each group bears the name of an artist: Klee or Kandinsky. You will be classified into one of the two groups, based on which painter you prefer.

The following procedure is used to determine to which group you will belong to.

Your screen will display five pairs of painting successively. In each pair, one painting was painted by Klee and the other one by Kandinsky. We will ask you to choose which one you prefer in each pair.

Then, you will be matched with people who have the closest preferences from yours. The program will assign each participant to either the Klee group or the Kandinsky group, in order to form two groups of equal size. Having a stronger preference for the paintings of a given artist will increase the likelihood to be assigned to this group. If there are too many participants in one group, those who had the weakest preference for this artist will be assigned to the other group.

Then, you will be informed of which group you belong to. During the rest of the task, you will remain in the same group.

In a second stage, two more paintings will be displayed on your screen. You will have to select the artist who you think made each painting. Each correct answer pays 50 ECUs.

Before entering your answers, you will have access to a chat program to get help from or offer help to other members of your group. You will not be able to communicate with members of the other group. For example, if you are a member of the Klee group you will only be able to chat with the others members of the Klee group, and conversely if you belong to the Kandinsky group. To chat, you have to write your message in the bottom part of the chat box and press enter to validate.

You will be given 8 minutes to access the chat program. Once the 8 minutes have elapsed, a new screen will be displayed in which you will have to enter your answers, individually. You will be informed of your payoff for this part at the end of the session. If you have questions about these instructions, please raise your hand or press the red button on the side of your desk. We will answer to your questions in private.



## **Part 2**

This part consists of five periods. In each period you will receive a certain endowment in ECUs. The amount varies from period to period. You will be asked to allocate these ECUs between two other participants (called Person A and Person B) under three scenarios:

- Scenario 1: both are from your own group
- Scenario 2: both are from the other group
- Scenario 3: one is from your group, and one is from the other group.

For each scenario you must allocate your entire endowment between the two participants. Allocations have to be integers. Do not allocate any ECU to yourself. Your decisions will be used to determine other participants' payoffs for this part at the end of the session. Similarly, your payoff for this part will be determined by others decisions.

At the end of the session, the program will randomly select a period that is used to calculate the payoffs. Each period of decision will have an equal chance of being selected. For the selected period, a new random draw will determine which scenario will be used to calculate the payoffs.

Then, the program will randomly select two participants. The allocation for Person A made by the first participant and the decision for Person B made by the second participant will be added to determine your payoff.

Depending on the random draw the selected participants can be from your group or not. If the first scenario is selected, the two participants will be from your group. If the second scenario is selected, the two participants will be from the other group. If the third scenario is selected, the first participant will be from your group and the second one from the other group.

You will be informed of your payoff for this part at the end of the session.

After reading again these instructions, if you have any questions please raise your hand and/or press the red button.

## **Part 3**

### **General description**

This part consists of 16 periods in which you will have to perform a task. In each period your task consists in solving problems during 30 seconds. Each problem solved increases your sub-score by one point.

In each period, you are randomly matched with another participant. Thus, it is very unlikely that you are matched with the same participant twice in a row.

At the end of the period, a participant in the pair earns 100 ECUs and the other earns 50 ECUs. Your payoff depends on your final score relative to the final score of the other participant. Your final score consists of two elements: your subscore plus a random number that you have to report. If your final score is higher than the final score of the other participant, the higher is the difference between your final score and the other participant's final score, the more likely you will get 100 ECUs.

At the end of the session, two periods among the 16 will be randomly selected by the program to determine your earnings in this part.

### **Description of each period**

A period consists of 4 stages.

- Stage 1: the task

You have to perform a task during 30 seconds. This task consists in decoding letters into numbers. A conversion table is displayed permanently on your screen. After having decoded the letters, you have to press the OK button to validate your answer. You are immediately informed of whether your answer is correct or not. If your answer is incorrect, you have to enter other numbers. The next problem will be displayed only after you have entered a correct answer. If your answer is correct, new letters are displayed and this will continue for 30 seconds. The conversion table changes in each period. It is the same for all the participants.

- Stage 2: matching pairs

The program forms pairs randomly. You are informed of the other participant's group (Klee or Kandinsky). Then, you are informed about your subscore and the subscore of the other participant. The other participant receives the same information as you.

- Stage 3: final score of the period

Your final score is determined by the sum of your subscore and the reported random number.

The program selects independently a random number for you and a random number for the other participant (with rebate). The random numbers are integers between -5 and 5. You are informed about your random number and the other participant's random number. You have to memorize these numbers because you will be asked to report one of them on the following screen in order to determine your final score.

Depending on the period, one of the two following cases occurs:

- Case 1: you have to report your own random number. The other participant reports his own random number.
- Case 2: you have to report the random number of the other participant. The other participant has to report your random number.

Once the random numbers have been reported, the program computes your final score and the other participant's final score. The final scores are determined differently in the two cases.

In case 1, your final score is equal to your subscore (the number of problems solved) plus your random number as reported by yourself. The computation is the same for the other participant.

**Case 1:** Your final score = your subscore + your random number as reported by yourself  
 Other participant's final score = his subscore + his random number as reported by himself

In case 2, your final score is equal to your subscore (the number of problems solved) plus your random number as reported by the other participant. The computation is the same for the other participant.

**Case 2:** Your final score = your subscore + your random number as reported by the other participant  
 Other participant's final score = his subscore + his random number as reported by yourself

- Stage 4: Determination of the payoff of the period

The higher is your final score relative to the final score of the other participant, the more likely you will earn 100 ECUs. The lower is your final score relative to the final score of the other participant, the more likely you will earn 50 ECUs.

More precisely, your chance of winning 100 ECUs is determined as follows:

$$\text{Your chance of winning 100 ECUs} = \frac{\text{Your final score}}{\text{Your final score} + \text{other participant's final score}}$$

This formula indicates that for your given final score, if the other participant's final score increases, your chance to win 100 ECUs decreases. In contrast, for a given final score of the other participant, if your final score increases, your chance to win 100 ECUs also increases. Your chance to win depends on your final score but also on the final score of the other participant, and the same logic applies to him.

- End of the period

- In case 1, you are informed of your final score. You are not informed of the final score of the other participant.

- In case 2, you are informed of the final score of the other participant, but you are not informed of your final score.

In both cases, you are informed of your payoff, either 50 ECUs or 100 ECUs.

The next period starts automatically. You have to perform the same task and new pairs are formed.

### **Summary**

In each period :

- You solve problems during 30 seconds.
- You are randomly matched with another participant.
- You are informed about the group of the other participant and about the subscore of this other participant.
- You are informed about your random number and the other participant's random number.
- You report one of the two random numbers, depending on the period.
- You are informed of your payoff and of your final score, or of the final score of the other participant, depending on the period.

Just before the end of the session, there will be a last stage. The instructions will be displayed on your screen. At this time, do not hesitate to ask questions by raising your hand and/or by pressing the red button.

### **End of the session**

At the end of the session, your screen will display the following information:

- Your earnings for part 1.
- The period and the case selected for the computation of your earnings in part 2 and your earnings for this part.
- The two periods selected in part 3 and your earnings for this part.
- Your earnings for the last stage.
- Your total earnings for the session.

Your earnings for the online part and the show-up fee will be added to the earnings of the session. The payment will be made by someone who does not know the content of the session and has no access to the program and the data.

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## Appendix 2. Tables

Table A1. Characteristics of participants, by treatment

	No-Identity treatment	Identity treatment	Test	<i>p</i> -value
Average nb of participations	4.17 (0.41)	3.66 (0.27)	Unpaired <i>t</i> -test	0.288
Average age	25.11 (1.07)	23.42 (0.51)	Mann-Whitney	0.632
Pro-self in SVO test (%)	59.37%	50.78%	Proportion test	0.260
Male (%)	42.19%	39.06%	Proportion test	0.677
Student (%)	71.87%	80.47%	Proportion test	0.178
Employed (%)	14.06%	12.50%	Proportion test	0.762
Unemployed (%)	9.37%	4.69%	Proportion test	0.206
Other (%)	4.69%	2.34%	Proportion test	0.379
<u>Number of subjects</u>	<u>64</u>	<u>128</u>		

*Note:* Standard deviations are in parentheses.

Table A2. Frequency and intensity of non-selfish misreporting, by treatment and condition

Treatment	Condition		Absolute (relative) frequency of misreports	Average absolute intensity of misreports	Absolute (relative) frequency of full misreports
No- Identity	Self	All	4/468 (0.85%)	2.75 (0.75)	0/4 (-)
	Opp	All	27/463 (5.83%)	3.70 (0.44)	6/27 (22.23%)
Identity		All	7/926 (0.76%)	2.57 (0.84)	2/7 (28.57%)
	Self	In-Group opponent	2/470 (0.43%)	2 (0.00)	0/2 (-)
		Out-Group opponent	5/456 (1.10%)	2.8 (1.20)	2/5 (40.00%)
		All	26/927 (2.80%)	3.69 (0.58)	7/26 (26.92%)
	Opp	In-Group opponent	15/457 (3.28%)	3.53 (0.80)	4/15 (26.67%)
		Out-Group opponent	11/470 (2.34%)	3.91 (0.88)	3/11 (27.27%)

*Notes:* We consider only the cases in which the subject overreports his opponent's number or underreports his own number. The average intensity of misreports is defined as the mean absolute value of the difference between the reported number and the actual number (with standard deviations in parentheses). A full misreport consists of reporting the lowest possible number for self or the highest possible number for the opponent. We exclude the cases in which the subject's number was equal to -5 in the Self-condition and the opponent's number was equal to 5 in the Opp-condition.

**Appendix 3. Figures**

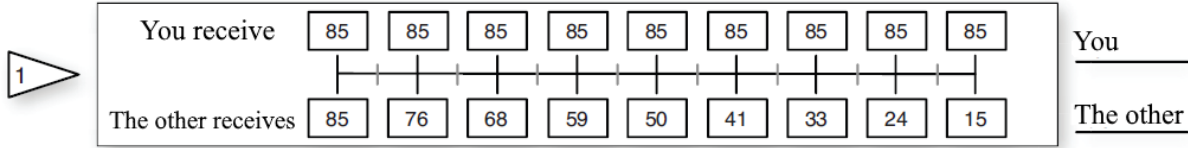


Figure A1. First decision in the SVO test

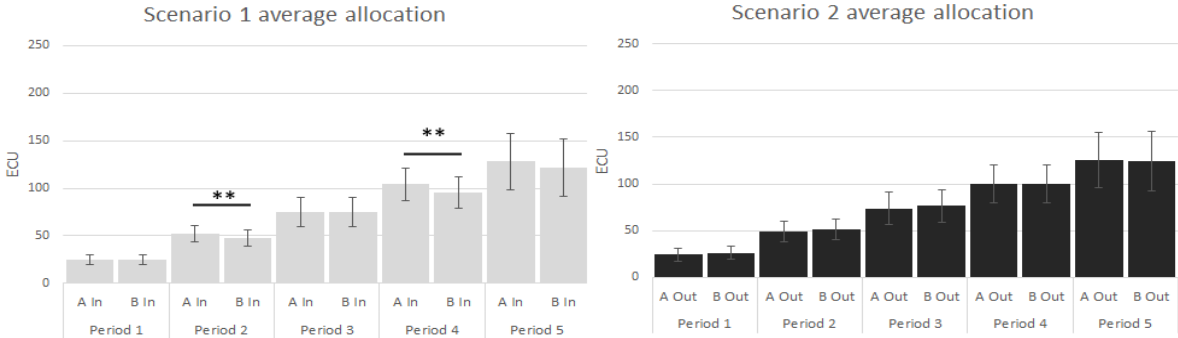


Figure A2. Average allocation in ECUs as a third party in scenario 1 (left panel) and scenario 2 (right panel), by period (stage 3 of the group identity induction procedure)

Notes: “In” stands for in-group and “Out” for out-group. In scenario 1, persons A and B are in-group members. In scenario 2, persons A and B are out-group members. \*\* indicates significance at the 5% level in two-sided pairwise *t*-tests.