Behavioural Science Institute

The Influence of Collaborating with an In-group or Out-group Member on Dishonest Behaviour

Tjits van Lent

Master's Thesis

Supervised by:
1. dr. Thijs Verwijmeren
2. dr. Gijs Bijlstra

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Radboud University

Abstract

Recent research has shown that a collaborative environment provides fertile ground for dishonest behaviour. However, less is known about the effect of group membership on the degree of dishonest collaborative behaviour. The present research project investigates the idea that collaborating with an in-group member results in more dishonest behaviour than collaborating with an out-group member. To this end, participants were paired with an in-group or out-group member prior to engaging in a sequential dyadic die-rolling paradigm. This resulted in two conditions: an in-group condition and an out-group condition. In the in-group condition two collaborators share a common group membership whereas in the out-group condition both collaborators are from different groups. Two studies were set up: experimentally manipulated group memberships (Study 1) and naturally existing group memberships (Study 2). Although collaborative dishonesty was found in both studies, the amount of displayed dishonest behaviour did not differ significantly between the in-group and out-group condition. We discuss alternative processes that may play a role in collaborative dishonesty resulting in the absence of the difference between both conditions. Future research should make an attempt to unravel the processes that lie at the basis of collaborative dishonesty.

Keywords: Corrupt collaboration, dishonest behaviour, decision-making, intergroup bias, in-group favouritism

The Influence of Collaborating with an In-group or Out-group Member on Dishonest Behaviour

In 2015, newspapers revealed that Volkswagen (VW) lied about the emission of eleven million cars worldwide. The employees at VW intentionally developed engine software that was able to change performance to seemingly lower emission numbers when cars were subjected to an emission test. Afterwards, people started to question how a scandal like this could have happened. It seems plausible that a group of employees together would be responsible, since a collaborative environment leads people to engage in excessive dishonest behaviour (Weisel & Shalvi, 2015; Wouda, Bijlstra, Frankenhuis, & Wigboldus, 2017). Research indicated that, when collaborating with others, people are found to be more dishonest compared to when they work alone in similar settings (Kocher, Schudy, & Spantig, 2017; Weisel & Shalvi, 2015). Together, these findings suggest that collaboration might lower the moral costs associated with dishonesty (Weisel & Shalvi, 2015). This phenomenon is called *corrupt collaboration*: the attainment of profits (e.g., selling more VW cars) by joint dishonest acts (e.g., work together to develop cheating emissions tests; Weisel & Shalvi, 2015).

Joint dishonest acts like this crucially depend on mutual dishonesty. That is, they are only possible if everybody joins in. Therefore, they rely on the sense of solidarity among collaborators, for example among the employees at VW. The sense of solidarity varies depending on with whom people collaborate. For example, we display solidarity when cooperating with someone with whom we share a common group membership (Yamagishi & Mifune, 2009). Since others are frequently involved in our decisions, it is important to investigate people’s dishonest behaviour in collaborative contexts. For example, collaborations frequently occur between individuals from different departments, companies and countries. Are people more likely to engage in dishonest behaviour when collaborating with someone from their own company (in-group) than from another company (out-group)? In the current research, we explored this question by examining the contextual conditions under which collaboration might turn dishonest.

Earlier research on contextual conditions in collaborative settings found that sharing a common group membership is a contextual condition that has a considerable influence on collaboration (Balliet, Wu, & De Dreu, 2014). In a large meta-analysis, Balliet et al. (2014) found that people are more collaborative with in-group, compared to out-group members, especially in collaborative situations that contain interdependence. Similarly, Romano and colleagues found that people extend greater cooperation to in-group members than out-group members (Romano, Balliet, Yamagishi, & Liu, 2017). For example, studies using social dilemma games like the prisoner's dilemma game showed that people cooperate more with in-group than with out-group members (Ando, 1999; Goette, Huffman, Meier, & Sutter, 2012). Thus, our collaborative behaviour seems greatly affected by sharing a common group membership with a collaborator. However, regarding dishonest behaviour, this effect remains unknown.

In the literature on dishonest behaviour, a distinction has been made between two different types of dishonest acts: *individual dishonesty* and *collaborative dishonesty* (Köbis, van Prooijen, Righetti, & van Lange, 2016). Individual dishonesty describes acts where one individual solely exploits entrusted power for private profit (e.g., embezzlement). Collaborative dishonesty, on the other hand, refers to dishonest acts where multiple individuals together exploit entrusted power for private profit in collaboration (e.g., VW scandal, bribery etc.).

In research on individual dishonesty, findings on the influence of shared group membership have shown that when you share a common group membership with an individual performing dishonest behaviour this influences your own dishonest behaviour.

Gino, Ayal, and Ariely (2009) showed that when you observe an in-group member performing dishonest behaviour this increases the possibility of acting dishonestly. Dishonest behaviour performed by an out-group member, however, reduced this possibility (see also: Gino, Gu, & Zhong, 2009). Similarly, observing someone who is psychologically close to you (i.e., sharing the same birthday) performing dishonest behaviour increases the likelihood of crossing ethical boundaries (Gino & Galinsky, 2012). Observers are more likely to conform with the behaviour displayed by an individual with whom they strongly identify (e.g., an in-group member). Group members use comparisons to their own group to preserve or increase positive social identity and self-esteem (Ayal & Gino, 2011). As a consequence, people are motivated to conform to norms established by an in-group member and engage in dishonest behaviour themselves. In contrast, when an out-group member engages in dishonest behaviour, people distance themselves from the displayed behaviour (Tajfel , 1982). Hence, in individual dishonest contexts people are likely to align with dishonest behaviour performed by an in-group member and behave dishonestly themselves.

As yet, it remains unclear whether these results, and the involved psychological processes, obtained in individual dishonest contexts generalize to collaborative dishonest contexts (Shalvi, Weisel, Kochavi-Gamliel, & Leib, 2016). Similar to dishonesty in individual contexts, the exposure to in-group members' dishonest behaviour is also an important psychological process in collaborative contexts. Next to the exposure to the dishonest behaviour of others, three additional psychological processes have been proposed to explain the role of shared group membership in collaborative contexts: (i) the willingness to work together, (ii) the prosocial interaction and (iii) the loyalty principle.

First, research on in-group favouritism showed that people prefer to collaborate with in-group over out-group members (Balliet et al., 2014; Romano et al., 2017). One could argue that since people display in-group favouritism in collaboration, they might also display in-group favouritism in dishonest collaboration. In dishonest collaboration, effective collaboration occurs when multiple individuals together exploit entrusted power for private profit. When people indeed display in-group favouritism in dishonest collaboration, individuals who share a common group membership might engage in more effective dishonest collaboration resulting in a larger profit.

Second, sharing a common group membership generally increases prosocial interaction (Penner, Dovidio, Piliavin, & Schroeder, 2005). Prosocial interaction symbolizes a wide-ranging category of actions that are “defined by society as generally beneficial to other people and the ongoing political system” (Piliavin, Dovidio, Gaertner, & Clark, 1981, p.4). This category contains a variety of behaviours that have the intention to benefit others, such as collaborating, helping, sharing, comforting and donating to charities. Concerning dishonest behaviour, one can also behave prosocially by telling prosocial lies. Prosocial lies are false statements intended to mislead and benefit a target (Levine & Schweitzer, 2014). For example, doctors might tell a prosocial lie about the severity of a medical diagnosis to benefit a patient (Iezzoni, Rao, DesRoches, Vogeli, & Campbell, 2012; Palmieri & Stern, 2009). In dishonest collaboration one can display prosocial behaviour by telling prosocial lies as telling these will benefit the other. Consequently, sharing a common group membership might result in more displayed dishonest prosocial acts (e.g., telling prosocial lies). This idea is supported by previous studies where it was found that increasing the feeling of bonding through the administration of oxytocin (i.e., a hormone that fosters altruism and bonding with others) encourages group-serving lies (Shalvi & De Dreu, 2014).

Finally, loyalty can encourage collaborative dishonest acts especially among in-group members (Van Vugt & Hart, 2004). Behaviour is loyal to the extent that it promotes (or at least is meant to promote) group well-being (Zdaniuk & Levino, 2001). Loyalty is established by feelings of anticipated guilt that arise when there is a possibility of letting down the dishonest partner. Individuals want to avoid disappointing their fellow in-group member and as a result they act in the interest of the dishonest partner. Put differently, feelings of guilt over disappointing the in-group partner might lead to loyalty in the dishonest behaviour resulting in more performed dishonest acts by the individual.

Based on this theoretical framework, we hypothesize that sharing a common group membership increases performed dishonest acts in a collaborative context, compared to collaborating with an individual with a different group membership. If indeed sharing a common group membership affects dishonest collaboration, this may have important implications for policy makers and managers in recognizing the situations in which collaboration might turn dishonest, and in taking the required measures to control and monitor it.

The present research

Hence, the present research project investigates the idea that collaborating with an in-group member results in more dishonest behaviour than collaborating with an out-group member. In order to measure dishonest collaboration we utilized the sequential dyadic die-rolling paradigm (Weisel & Shalvi, 2015). In this paradigm there are always two collaborators: Player A and Player B. Each trial starts with Player A privately rolling a die and reporting the outcome. Next, Player B is informed about Player A's report and proceeds to roll a die and report the outcome to Player A. Both players receive money only if they both report the same number, with higher numbers representing higher payoff. If the reported numbers are not the same, both earn nothing. Prior to engaging in a sequential dyadic die-rolling paradigm, participants were paired with either an in-group member or out-group member. Two studies were set up: one with experimentally manipulated groups (Study 1) and one with naturally existing groups (i.e., friends versus strangers, Study 2). In both Study 1 and Study 2, dishonest behaviour was operationalized as the amount of reported doubles by dyads as well as the average value of Player A's report, as both are positively related to the shared winnings of both partners. Both studies (all hypothesis, materials and analyses) were pre-registered (see: https://osf.io/p2g9f/registrations)[1].

Study 1

The goal of Study 1 is to test whether collaborating with an in-group member resulted in more dishonest acts compared to collaborating with an out-group member. In this study, in-group and out-group membership was experimentally manipulated.

Method

Participants

Given the parameters from a prior study utilizing the sequential dyadic die-rolling paradigm with a between subjects manipulation (Study 2, Wouda et al., 2017), a power analysis using the package simr (Green & Macleod, 2016) indicated that 80 participants were sufficient (Estimate = .40, power = .81). To account for dropouts, 88 participants were recruited using ORSEE[2] (Greiner, 2015), and voluntarily participated in seven experimental sessions consisting of 12 participants on average. All participants present in a given session were strangers. Two participants (i.e., one dyad) were excluded from analyses due to a mistake regarding group classification. Therefore, data of 86 participants were used (53,4% male, M_{age} = 21.10, SD_{age} = 2.60). Participants were offered a fixed fee of €4,- for joining the study. Similar to Wouda et al. (2017), participants could additionally earn up to a maximum of 12 Experimental Currency Units (ECU). Each ECU was worth €0.25. Participants could thus maximally earn an additional €3,- on top of the fixed fee for their participation.

Materials and Procedure

The experiment was programmed in z-Tree (Fischbacher, 2007). As the study utilized the Dutch version of the sequential dyadic die-rolling paradigm (Wouda et al., 2017), the same script was used. Minor changes were made to the instructions. All sessions took place in the Radboud University XLab. The experiment consisted of three parts: group classification, the instructions and the experimental task.

Group Classification. In order to generate the two conditions, participants were classified into two groups and they were either paired with someone from their own group (i.e., in-group condition) or with someone from the other group (i.e., out-group condition). Upon entering the lab, participants were pseudo-randomly assigned to either the green group or the blue group based on their sequence of arrival. Members of each group received a bracelet of the appropriate colour. After creating the two groups, participants performed a Hula-Hoop Challenge. The goal of this challenge was to strengthen feelings of group membership and to grow rivalry between groups, thus to increase in-group and out-group identification. In the challenge, participants formed a line by holding hands with their teammates. The two lines stood opposite to each other. The goal of the challenge was to get the hula-hoop to the other side of the line as quickly as possible by stepping through the hula-hoop without anyone letting go of their teammates' hands. The group who was the quickest won the challenge and received applause from the other group.

Instructions. After completing the Hula-Hoop Challenge, participants were individually seated in a cubicle with a laptop. The cubicles either contained a green or a blue sign. Participants were asked to take a seat in a cubicle which contained a sign of their group-colour. In addition, each cubicle contained a die, a cup with a little peep hole in the bottom, a pen, a written instructions form, an informed consent form and a payment form including three questions: two questions about in-group favouritism and one question about group identification (See Appendix A). The forms were combined into one instruction booklet.

Once all participants were seated, they were verbally instructed about the experimental task. Participants were asked to open the instruction booklet. The experimenter read the instructions aloud and individually answered questions from participants. Participants were informed that they would be paired into dyads with another student, which would be their partner during the experiment. Participants were either paired with someone from their own group (i.e., in-group condition) or with someone from the other group (i.e., out-group condition). In addition, participants were instructed that the amount of ECU they could earn would depend on the result of their own die roll, and the die roll of their allocated partner. When participants understood the task, they were requested to put their signatures to the informed consent form.

Experimental Task. Prior to the experimental task, participants were assigned to the role of Player A or Player B. During the experiment, Player A would roll the die first and Player B would roll the die second. Moreover, participants were shown the payoff rules. That is, if both players reported the same number (i.e., a double), they earn the value rolled in ECU's , else: both earned nothing. The higher the double reported, the more ECU's they earned. For example, if both players reported a 6, they both earned 6 ECU whereas if both players reported a 1, they both earned 1 ECU. An ECU was worth €0.25 resulting in a maximum gain of €1.50 each trial (See Figure 1). The experimental task consisted of three parts: a practice phase, a one-shot trial for actual payoff and the main experimental task.

Procedure	**Example 1 – Double**
1. Player A privately rolls a die and reports the outcome 2. Player B learns about A's report 3. Player B privately rolls a die and reports the outcome 4. Player A learns about B's report	Player A reported Player B reported Payment: A gets €1,25, B gets €1,25
Payment	**Example 2 – No Double**
If the reported outcomes are equal each player receives the reported amount times €0,25. If the reported outcomes are not equal both players receive nothing.	Player A reported Player B reported Payment: A gets €0, B gets €0

Figure 1. Explanation of the Sequential Dyadic Die-Rolling Paradigm.

First, to ensure proper understanding of the experiment and the belief that the die was fair, participants engaged in three practice trials. In these, participants were asked to roll the die for both Player A and Player B and to enter the outcomes on the laptop. Participants received feedback about the payoff associated (i.e., the amount of ECU) with these rolls after each practice trail. After participants indicated they understood the experiment, they proceeded to the second part: the one-shot trial.

In this trial, participants were allocated to a partner. This was either an individual from their own group (i.e., in-group condition) or an individual from the other group (i.e., out-group condition). To ensure that participants were aware whether their partner is an in-group or out-group member, they were asked to report the group membership of their partner. Together they played a one-shot trial for actual payoff. This one-shot trial allowed both players to earn a maximum of €1.50 (6 ECU), which determined the first half of participants' extra payoff. In this trial, each player privately rolled a die and reported the outcome. The actual outcome was completely private, allowing players to misreport. Player A rolled a die and reported the outcome. Next, Player B was informed about Player A's reported outcome, and proceeded to roll a die and report the outcome. Player B's reported outcome was then shared with Player A. If a double was reported, they earned the outcome of the die roll in ECU, else, they earned nothing. After participants learned about the amount of ECU they had earned in the one-shot trial, they continued to the main experiment.

Lastly, the main part of the experiment was identical to the one shot-trial, except that participants were informed that they would perform in several trials up to a maximum of 30 with the same partner. Unbeknown to the participants, they always engaged in 20 trials. Participants were informed that they would be paid according to the result of one of these trials which was fixed at the beginning of the experiment. This determined the second half of participants' extra payoff. At the end of the experiment, participants' final payoff was shown on the laptop screen and participants were individually paid. In addition, they were asked to fill in the questionnaire (See Appendix A) at the bottom of the payment form.

Analyses

In order to investigate our hypothesis, a binomial generalized linear mixed effects analysis of the relationship between reported amount of doubles and in-group-out-group condition was performed in RStudio (RStudio, 2016), with more doubles reported representing more dishonesty. RStudio (Rstudio, 2016) is a free and open source integrated development environment (IDE) for R (R Core Team, 2017). For this, the glmer function from the *lme4* package was used (Bates, Maechler, Bolker, & Walker, 2015). In addition, a linear mixed effects analysis of the relationship between the value of Player A's reported outcome and in-group-out-group condition was performed, as the value of Player A's reported outcome represents Player A's (dis)honesty. The higher the value of Player A's reported outcome, the more dishonest Player A is. For this, the lmer function from the *lme4* package was used (Bates et al., 2015). Both methods entail estimating both fixed and random effects. To avoid inflated Type I errors, Barr, Levy, Scheepers and Tily (2013) advise to use a maximal random-effects structure when possible. That is, a per-dyad (or per-participant) random adjustment to the fixed intercept ("random intercept") was modelled.

Moreover, participants' reported amount of doubles was compared to a baseline level based on chance. Assuming full honesty, the probability of rolling a double in a single trial is 1/6. Thus, the mean amount of reported doubles by all dyads given 20 trials would be 3.33 (20/6: 16.67%). Additionally, the mean value of Player A's reported outcome was compared to a baseline level based on chance. Assuming full honesty, the probability of rolling a certain value is 1/6. Therefore, the expected value of Player A's reported outcome given 20 trials would be 3.5 ((1+2+3+4+5+6)/6). Figure 2 shows a computer simulation of truthful behaviour of all players (Player A and Player B) in 20 trials.

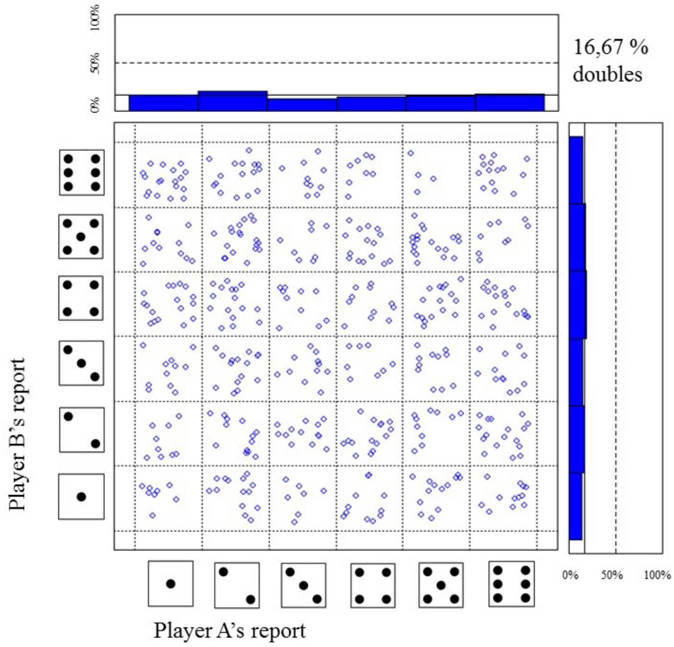


Figure 2. Computer simulation of truthful behaviour of Player A and Player B. Each dot represents a hypothetical report of Player A and Player B in a single trial. The histograms on the right and on top display the hypothetical total percentage of how often each number was reported by each player.

Model Setup

The first maximal model included a fixed effect of in-group-out-group condition (coded using sum-to-zero contrasts, with in-group coded as +1 and out-group coded as -1). Keeping a maximal random-effects structure as suggested by Barr et al. (2013), a per-dyad adjustment to the fixed intercept (i.e., a random intercept of dyad) was included. The main maximal model in RStudio (RStudio, 2016) looked as follows:

cbind(Total Doubles, 20 –Total Doubles) ~ Group Condition +(1|Dyad)

P-values were determined using the mixed function from the *afex* package (Singmann, Bolker, Westfall, & Aust, 2018), using Type III tests and the parametric bootstrap method (with 1000 simulations), which in turns calls on the PBmodcomp function of the *pbkrtest* package (Halekoh & Højsgaard, 2014).

The second maximal model also included a fixed effect of in-group-out-group condition (coded using sum-to-zero contrasts, with in-group coded as +1 and out-group coded as -1). Keeping a maximal random-effects structure as suggested by Barr et al. (2013), a per-participants adjustment to the fixed intercept (i.e., a random intercept of participant) was included. The main maximal model in RStudio (RStudio, 2016), looked as follows:

Decision Player A ~ Group Condition + (1|Participant)

P-values were determined using the mixed function from the *afex* package (Singmann et al., 2018), using Type III conditional *F* tests with Kenward-Roger approximation for degrees of freedom, which in turns calls on the KRmodcomp function of the *pbkrtest* package (Halekoh & Højsgaard, 2014).

Results

Raw Data & Model Diagnostics

First, we examined the model diagnostics of the first main maximal model. Scaled model residuals were normally distributed.

Second, we inspected the raw data with regard to the assumption of normality before performing the second main analysis. The distribution of the dependent variable (the value of Player A's reported outcome) was not normal in both conditions (in-group and out-group condition).

Next, model diagnostics of the second main maximal model were examined. Scaled model residuals were normally distributed: The assumptions of homoscedasticity and linearity were also met.

Manipulation Check

We conducted two separate one-sample *t*-tests[3] to determine whether the score for in-group favouritism and identification was different from neutral, defined as a score of 4. The score for in-group favouritism was computed by taking the mean score of question 1 and 3 (See Appendix A, question 3 was reverse scored). In-group favouritism and identification were significantly and positively correlated to one another (*r*=.36, *p*<.001). The score for in-group favouritism (*M* = 4.49, *SD* =.98) was significantly higher than the neutral score of 4, *t*(86) = 4.65, *p*<.001, and score for the identification with own group (*M* = 4.00, *SD* =1.29) did not significantly differ from the neutral score of 4, *t*(86) =0.00, *p*= 1.00. These results suggest that participants had a higher favouritism for their own group compared to the other group but did not identify more with their own group as compared to the other group, indicating that our manipulation was partly successful.

Confirmatory Analyses

In the in-group condition, dyads (23) reported 10.91 (54,55%) doubles on average (*SD*= 6.50), whereas in the out-group condition, dyads (20) reported 9.75 (48,75%; see Figure 3) doubles on average (*SD*= 5.23). With respect to our research question, the binomial generalized linear mixed model yielded no significant differences between in-group-out-group condition in the amount of reported doubles, χ^2 (1)= 0.34, *p* = .556[4] (see Figure 4). Although the amount of reported doubles slightly differs, no evidence was found that the reported amount of doubles was higher for dyads in the in-group condition than for dyads in the out-group condition.

Next, we conducted three separate Mann-Whitney-Wilcoxon Tests to compare the amount of reported doubles by dyads in general and for each condition separately to the expected 3.33 assuming honesty. The results showed that overall the average amount of reported doubles (*Mdn* = 9.00) differed significantly from chance level (*U* = 920, Z = -5.40, *p*<.001, *d*=0.82), demonstrating participants' dishonesty. In addition, the results showed that this pattern of results was similar in both conditions. The average amount of reported doubles for the in-group condition (*Mdn* = 12.00) and for the out-group condition (*Mdn* = 8.00) differed significantly from chance level (respectively: *U* = 260, Z = -3.70, *p*<.001, *d*=0.77 and *U* = 209, Z=-3.87, *p*<.001, *d*=0.87), demonstrating participants' dishonesty in both conditions.

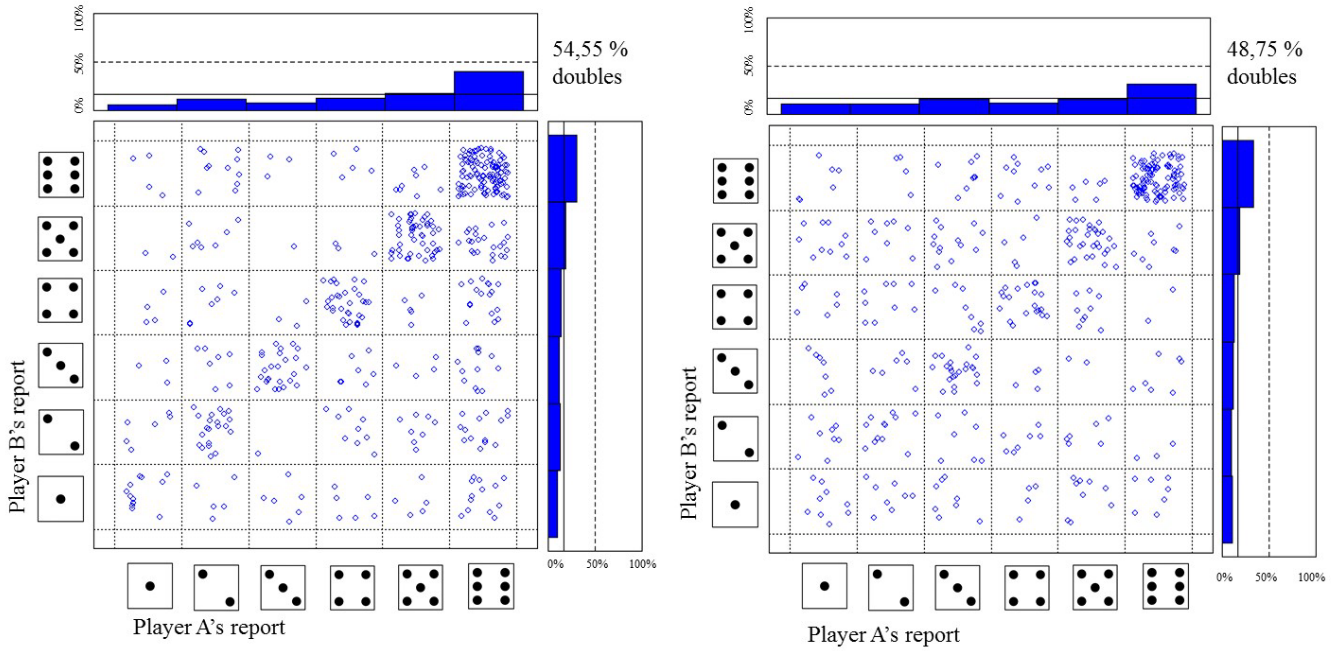


Figure 3. The left figure shows the in-group condition. The right figure shows the out-group condition. Each dot represents a report of both players in a single trial. The histograms on the right and on top display the total percentage of how often each number was reported by each player.

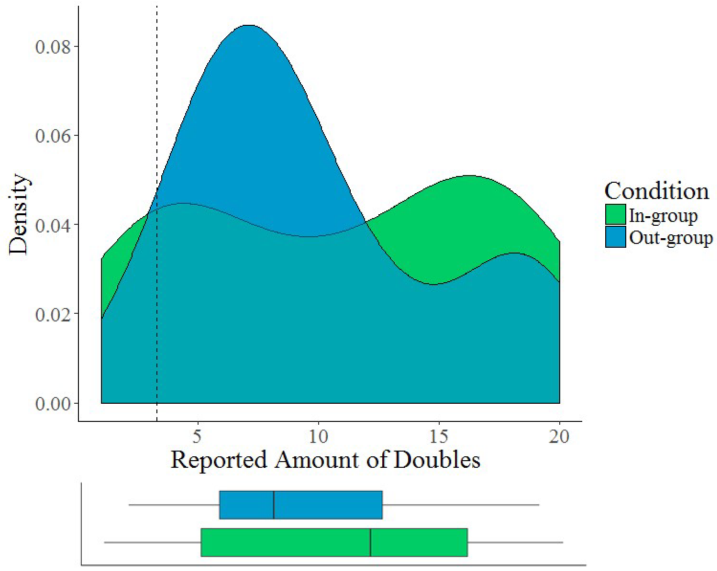


Figure 4. Densityplot and boxplot that compares the distribution of the reported amount of doubles in the in-group condition with the out-group condition. The dashed black line represents the hypothetical mean assuming honesty.

Second, we examined the difference in dishonesty of Player A between in-group-out-group condition. The linear mixed effects analysis yielded no significant differences between in-group-out-group condition in the value of Player A's reported outcome, Estimate = 0.20, SE=0.15, $F(1,41)$ =1.88, p = .178[5] (see Figure 5). That is, no evidence was found that the value of Player A's reported outcome in the in-group condition (M = 4.46, SD =0.93) was higher compared to Player A's reported outcome in the out-group condition (M = 4.05, SD =1.03).

Next, we conducted three separate Mann-Whitney-Wilcoxon Tests[6] to compare the average value of Player A's reported outcome in general and for each condition separately to the expected 3.5 assuming honesty. The results showed that overall the average value of Player A's reported outcome (Mdn=4.00) significantly differed from chance level (U = 751.5, Z = -4.16, p<.001, d=0.63), demonstrating a dishonest Player A. In addition, the results showed that in the in-group condition the average value of Player A's reported outcome (Mdn = 4.10) significantly differed from chance level (U = 263, Z = -3.79, p<.001, d=0.79), demonstrating that Player A was dishonest in the in-group condition. In the out-group condition, however, the average value of Player A's reported outcome (Mdn = 3.58) did not significantly differ from chance level (U = 126, Z=-1.74, p=.081, d=0.39), demonstrating an honest Player A in the out-group condition.

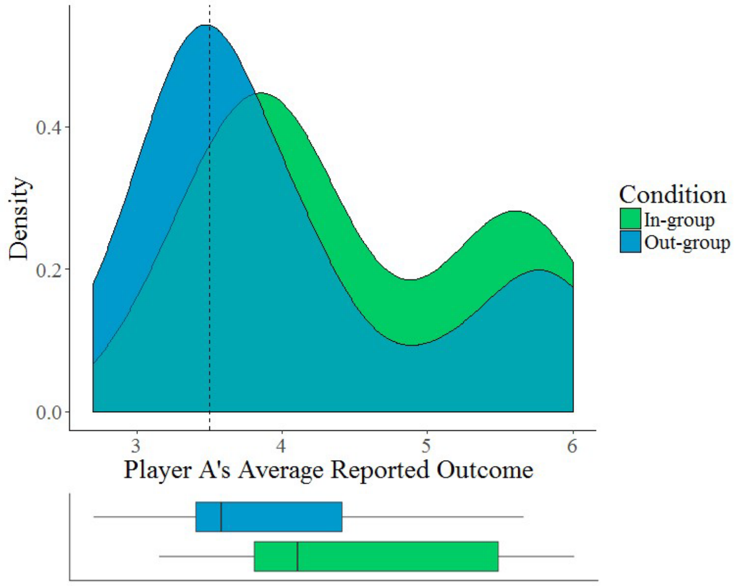


Figure 5. Densityplot and boxplot that compares the average value of Player A’s reported outcome in the in-group condition with the out-group condition. The dashed black line represents the hypothetical mean assuming honesty.

Exploratory Analysis

An additional analysis was conducted in an exploratory fashion to examine whether there was an influence of the value of Player A’s reported outcome on the decision of Player B (i.e., report a double or not) and whether this influence differed between in-group-out-group condition. In doing so, we wanted to examine whether the dishonest decisions of Player B were influenced by the dishonest decisions of Player A. To investigate this, a new model was written, including decision of Player B (double or no double) as dependent variable and in-group-out-group condition and the value of Player A’s reported outcome (centered) as fixed effects. Additionally, the interaction between the latter two was added as fixed effect. A random intercept of dyad was included, leading to the maximal model written in RStudio (Rstudio, 2016) as follows:

*Decision Player B ~ Value Player A * Group Condition + (1|Dyad)*

The model yielded no significant interaction effect between between the value of Player A’s reported outcome and in-group-out-group condition on the decision of Player B (i.e., reporting a double), χ^2 (1)= .004, *p* = .946. The model did yield a significant main effect of the value of Player A's reported outcome, χ^2 (1)= 27.18, *p* <.001, with decision of Player B (i.e., reporting a double) increasing as a function of the value of Player A's decision for both conditions, demonstrating that reporting a higher value by Player A influences the decision of Player B to report a double (i.e., perform dishonest behaviour) for both in-group and out-group condition (see Figure 6).

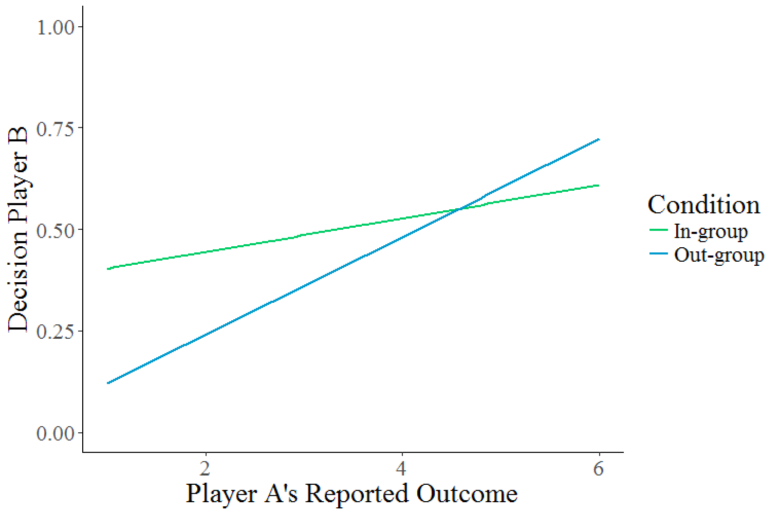


Figure 6. Lineplot that compares the influence of Player A's reported outcome on the decision of Player B (i.e., a double or not) in the in-group condition with the out-group condition.

Discussion

The first study aimed to investigate whether collaborating with an in-group or out-group member differentially influences dishonest acts when individuals are allocated to an experimentally manipulated group. Specifically, we hypothesized that in-group dyads would perform more collaborative dishonest acts, compared to out-group dyads. However, against our pre-registered hypothesis, we did not find evidence for this in Study 1.

We replicated the effect of collaborative dishonesty in both the in-group and out-group condition (Weisel & Shalvi, 2015; Wouda et al., 2017): Dyads in both conditions reported a higher amount of doubles than expected by chance, displaying dishonest behaviour. In addition, although the pattern of behaviour of the in-group condition seems more dishonest than the pattern of behaviour of the out-group condition, this difference was not significant.

Furthermore, we replicated the effect of dishonesty for Player A in general and in the in-group condition (Weisel & Shalvi, 2015) as Player A reported a higher value than would be expected by chance. However, this effect was absent in the out-group condition, which demonstrated an honest Player A. Still, Player A's (dis)honesty did not differ significantly between both conditions. Moreover, our exploratory analysis indicated that the decision of Player B to report a double was influenced by the reported value by Player A for both the in-group and out-group condition. Usually, a higher reported value meant a more dishonest Player A, which in turn influenced the dishonesty of Player B (i.e., the decision to report a double or not). This indicates that both players collaborate in a dishonest manner, but the degree of dishonest collaboration did not differ between in-group or out-group condition.

It may be the case that the differences in dishonesty between in-group-out-group condition were absent because the sample size was too small. The real effect size might have been smaller than the one on which we based our sample size. Consequently, the power of the paradigm might have been low. In addition, our manipulation of group membership might not have been strong enough, resulting in indefinite feelings of group membership. Indeed, individuals favoured members of their own group more than the other group but did not seem to identify more with their own group as compared to the other group. Therefore, instead of using experimentally manipulated group memberships, we made use of naturally existing groups in Study 2, in which we aim to create a stronger feeling of group identification.

Study 2

Up to now, research on collaborative dishonesty has been conducted in a laboratory setting (Barr & Michailidou, 2017; Soraperra et al., 2017; Weisel & Shalvi, 2015; Wouda et al., 2017). In order to increase the external validity of the paradigm and to generalise findings to a more natural setting, our second study was conducted in the field. In addition, since the manipulation of group membership in Study 1 only partly succeeded, we decided to conduct a study with a stronger manipulation of group membership. In Study 2, instead of manipulating group membership experimentally, we used naturally existing groups. Participants were either paired with someone they know (e.g., friend, relative, acquaintance etc.) or with a stranger prior to engaging in the sequential dyadic die-rolling paradigm.

Method

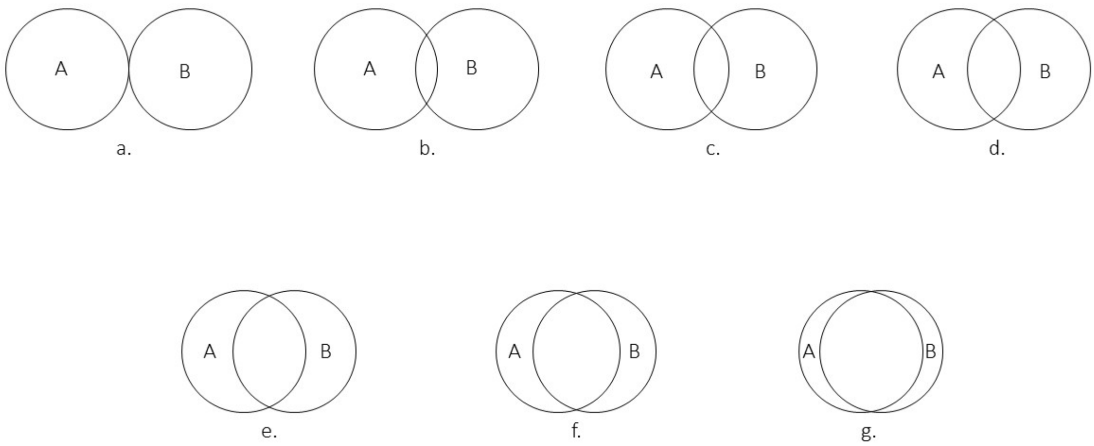
Participants

Eighty-six participants took part in the study on a Dutch public holiday (King’s Day). The participants sample size was determined by the maximum amount of participants that was able to participate given this one day. Participants were recruited in a city park in Nijmegen, The Netherlands. Eight participants were excluded from the analysis because they failed to follow the instructions properly (six participants (three dyads) did not complete all trials, two participants (one dyad) did not comply with instructions and wrote anything other than a circle around the number on the report paper). Therefore, data of 78 participants were used (38,4 % male, M_{age} = 32.95, SD_{age} = 13.53). Participants voluntarily participated and the study allowed winning a prize.

Materials and Procedure. The materials and procedure in Study 2 were partly identical to Study 1, with several considerable modifications. The biggest modification was that no laptops were involved in the experiment: Instead of entering the outcome on the laptop, participants drew a circle around the number they wanted to report on the report paper. The experiment consisted of 3 parts: recruiting participants, instructions and the experimental task.

Recruiting Participants. In order to generate the two conditions, participants took part in the experiment with someone they know (i.e, in-group condition) or with a complete stranger (i.e., out-group condition). Participants were approached in the park in pairs of two. We approached two pairs simultaneously. Then, we either split the pairs and let them perform in the paradigm with a stranger (out-group condition) or we retained the pairs and let them perform in the paradigm with someone they knew (in-group condition).

Instructions. After pairing the participants, they were placed at a table together with their allocated partner. On each table was a screen in the middle to prevent dyads to see each other during the experiment and a box where participants needed to put in their reported outcomes. In addition, for each participant there was a die, a cup with a little peep hole in the bottom, a pen and a question concerning the Inclusion of Other in the Self Scale (IOS Scale; Aron, Aron, & Smollan, 1992). First, participants were assigned to the role of Player A or Player B and were informed to fill in the IOS Scale. In this, participants were asked how close they felt to the other player (see Figure 7).



represent either Player A of Player B. Question: Which diagram best represents how close you feel to the other Player? (Please circle one letter).

Next, participants received a booklet of report forms and were verbally instructed about the experimental task. They learned that the prize that they could earn would depend on the result of their own roll and the roll of their allocated partner. If both players reported the same number (i.e., a double), they earned a prize, else; they earned nothing. If they reported a double, the value of the prize was based on the number they reported. The higher the double reported, the greater the prize. The prizes were divided into three mystery boxes, one for a low double (a double 1 or 2), one for a middle double (3 or 4) and one for a high double (5 or 6).

Experimental Task. The experimental task consisted of two parts: a practice trial and the main experiment. To ensure proper understanding of the rules of the experiment, participants first engaged in one practice trial together. In this, each player privately rolled a die and reported the outcome. Player A rolled a die and reported the outcome by drawing a circle around the number on the report form. The actual outcome was completely private, allowing players to misreport. Next, Player A handed the report form to Player B. Player B proceeded to roll a die and reported the outcome. Player B handed the report form to Player A, so that Player A was informed about B's reported outcome. Finally, Player A put the report form in the box. The main experiment was identical to the practice trial, except that participants were informed that they would perform in several trials until all report forms were used. Unknown to the participant, they always engaged in 10 trials. Participants were informed that whether they would win a prize would depend on the results of one of these trials, which was randomly drawn out of the box at the end of the experiment. If the drawn report form contained a double, participants could draw a prize from the appropriate mystery box.

Analyses

In order to investigate our hypothesis, the same analyses as in Study 1 were performed[7]. In addition, the baseline level based of chance for participants' reported amount of doubles was adjusted to the 10 trials. The expected amount of reported doubles by all dyads given 10 trials would be 1.67 (10/6; 16,67%).

Results

Raw Data & Model Diagnostics

First, the model diagnostic of the first main maximal model were examined. Scaled model residuals were normally distributed.

Second, we inspected the raw data with regard to the assumption of normality before performing the second main analysis. The distribution of the dependent variable (the value of Player A's reported outcome) was normal for the out-group condition but not for in-group condition.

Next, we examined the model diagnostics of the second main maximal model. Scaled model residuals were normally distributed: The assumptions of homoscedasticity and linearity were also met.

Manipulation Check

We conducted an independent-samples *t*-test to compare participants' scores on the IOS Scale between the in-group condition and the out-group condition. There was a significant difference in the scores for the in-group (M = 5.19, SD = 1.51) and the out-group condition (M =2.13, SD = 1.17), $t(72.51)=10.02$, $p<.001$. These results suggest that participants had a higher feeling of closeness in the in-group condition compared to the out-group condition, indicating that our manipulation was successful.

Confirmatory Analyses

In the in-group condition, dyads (24) reported 3.71 (37,10%) doubles on average (SD=2.66), whereas in the out-group condition, dyads (15) reported 2.87 (28,67%) on average (SD = 2.36). With respect to our research question, the binomial generalized linear mixed model yielded no significant differences between in-group-out-group condition in the amount of reported doubles, χ^2 (1)= 1.18, p = .267[8] (see Figure 8). Although the amount reported doubles slightly differs, no evidence was found that the reported amount of doubles was higher for dyads in the in-group condition than for dyads in the out-group condition.

Next, we conducted three separate Mann-Whitney-Wilcoxon Tests to compare the amount of reported doubles by dyads in general and for each condition separately to the expected 1.667 assuming honesty. The results showed that overall the average amount of reported doubles (*Mdn* = 3.00) significantly differed from chance level (*U* = 631, *Z* = -1.28, *p*<.001, *d*=0.21), demonstrating participants' dishonesty. In addition, the results showed that in the in-group condition the average amount of reported doubles (*Mdn* = 3.00) significantly differed from chance level (*U* = 260, *Z* = -3.14, *p*=.002, *d*=0.64), demonstrating participants' dishonesty in the in-group condition. In the out-group condition, however, the average amount of reported doubles (*Mdn* = 2.00) did not significantly differ from chance level (*U* = 83, Z=-1.28, *p*=.199, *d*=0.33), demonstrating participants' honesty in the out-group condition.

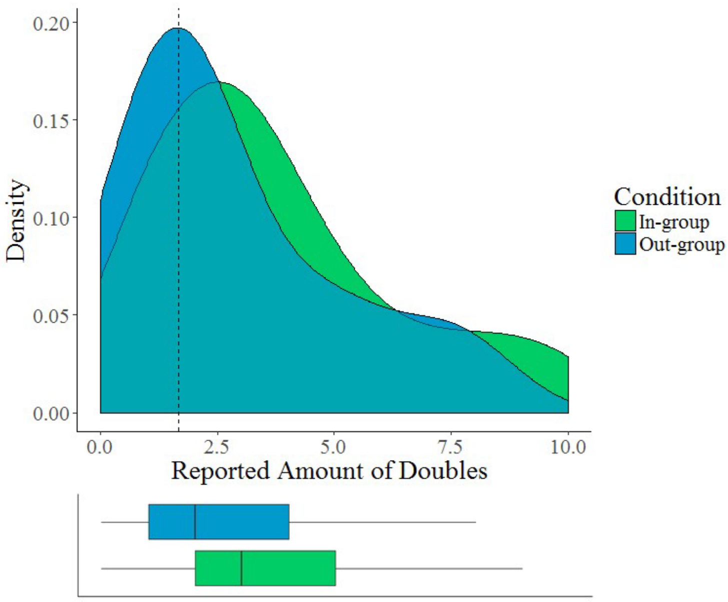


Figure 8. Densityplot and boxplot that compares the distribution of the reported amount of doubles in the in-group condition with the out-group condition. The dashed black line represents the hypothetical mean assuming honesty.

Second, we examined the difference in dishonesty of Player A per in-group-out-group condition. The linear mixed effects analysis yielded no significant differences between condition in the value of Player A's reported outcome, Estimate = -0.002, *SE*=0.16, $F(1,37)$ =0.0001 , p = .992[9] (see Figure 9). That is, no evidence was found that the value of Player A's reported outcome in the in-group condition (*M* = 3.88, *SD* =1.80) was higher than Player A's reported outcome in the out-group condition (*M* = 3.89, *SD* =1.80).

Next, we conducted three separate Mann-Whitney-Wilcoxon Tests[10] to compare the average value of Player A's reported outcome in general and for each condition separately to the expected 3.5 assuming honesty. The results showed that overall the average value of Player A's reported outcome (*Mdn* =3.60) differed marginally significant from chance level (*U* = 430, Z = -1.88, *p*=.061, *d*=0.30), neither demonstrating Player A's honesty or dishonesty. The results for both conditions separately however, showed that for both conditions the average value of Player A's reported outcome (in-group condition: *Mdn* = 3.55, out-group condition: *Mdn* = 3.60) did not differ significantly from chance level (in-group condition: *U* = 167, Z = -1.30, *p*=.194, *d*=0.27; out-group condition: *U* = 66, Z=-1.40, *p*=.162, *d*=0.36), demonstrating Player A's honesty in both conditions separately.

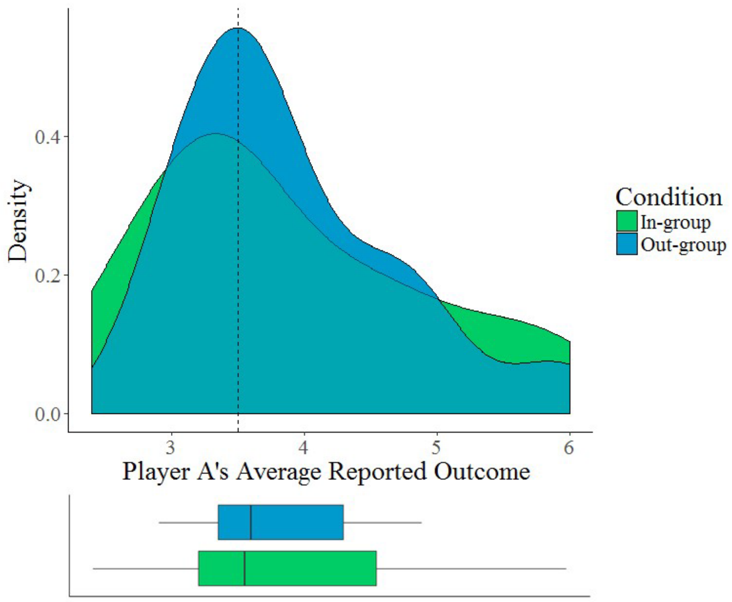


Figure 9. Densityplot and boxplot that compares the average value of Player A's reported outcome in the in-group condition with the out-group condition. The dashed black line represents the hypothetical mean assuming honesty.

Exploratory Analyses

Two additional analyses were conducted in an exploratory fashion to understand the data better and find possible patterns that were beyond the scope of our main analysis. Firstly, it was examined whether there was an influence of the value of Player A's reported outcome on the decision of Player B (i.e., report a double or not) and whether this influence differed between in-group-out-group condition. In doing so, we wanted to examine whether the dishonest decisions of Player B were influenced by the dishonest decisions of Player A. To investigate this, a new model was written, including decision of Player B (double or no double) as dependent variable and in-group-out-group condition and the value of Player A's reported outcome (centered) as fixed effects. Additionally, the interaction between the latter two was added as fixed effect. A random intercept of dyad was included, leading to the maximal model written in RStudio (Rstudio, 2016):

*Decision Player B ~ Value Player A * Group Condition + (1|Dyad)*

The model yielded no significant interaction effect between between the value of Player A's reported outcome and in-group-out-group condition on the decision of Player B (i.e., reporting a double), χ^2 (1)= .03, p = .869 (see Figure 10). In addition, the model did not yield a significant main effect of the value of Player A's reported outcome on the decision of Player B (i.e., reporting a double), χ^2 (1)= 1.34, p =.260, demonstrating that reporting a higher value by Player A did not influence the decision of Player B to report a double (i.e., perform dishonest behaviour) for both in-group and out-group condition.

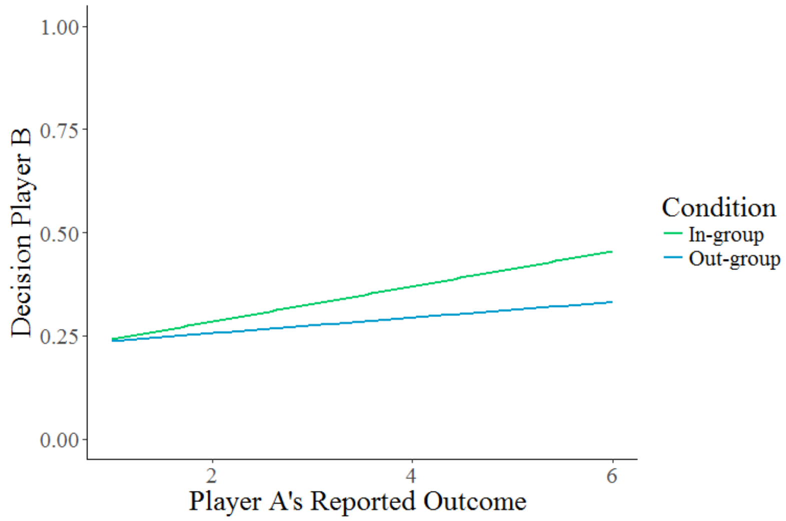


Figure 10. Lineplot that compares the influence of Player A's reported outcome on the decision of Player B (i.e., a double or not) in the in-group condition with the out-group condition.

Secondly, we wanted to examine whether both studies differed on the number of reported doubles. Since dyads only performed in 10 trials in Study 2 (compared to 20 trials in Study 1) the number of reported doubles in Study 2 was multiplied by 2 in order to make comparisons between both studies. To investigate this, a new model was written, including the number of reported doubles as dependent variable and in-group-out-group condition and study as fixed effects. Additionally, the interaction between the latter two was added as fixed effect. A random intercept of dyad was included, leading to the maximal model written in RStudio (RStudio, 2016):

*Cbind(Total Doubles, 20 – Total Doubles) ~ Group Condition*Study + (1|Dyad)*

The model yielded no significant interaction effect between in-group-out-group condition and study on the number of reported doubles, χ^2 (1)=0.12, p = .735. The model also yielded no significant main effect of in-group-out-group condition on the number of reported doubles, χ^2 (1)=1.40, p = .233. The model did yield a significant main effect of study, χ^2 (1)=9.40, p = .005, with more reported doubles in Study 1 (M = 10.37, SD =5.91) compared to Study 2 (M = 6.77, SD = 5.10), demonstrating that the reported amount of doubles differs per study.

Next, in order to gain further insight into this observed difference, we examined both conditions separately. Two separate datasets were created: a dataset including reports from the in-group condition of Study 1 and 2 (i.e., in-group comparing model) and a dataset including reports from the out-group condition of Study 1 and 2 (i.e., out-group comparing model). The same model as our main binomial generalized linear mixed model was used. The in-group comparing model yielded a marginally significant difference between Study 1 and Study 2 in the amount of reported doubles, χ^2 (1)= 3.77, p = .051, with dyads in Study 1 reporting 10.91 doubles on average and dyads in Study 2 reporting 7.42 doubles on average. Additionally, the out-group comparing model yielded a significant difference between Study 1 and Study 2 in the amount of reported doubles, χ^2 (1)= 6.21, p = .014, with dyads in Study 1 reporting 9.75 doubles on average and dyads in Study 2 reporting 5.73 doubles on average.

Discussion

In Study 2 we tested our hypothesis that dyads in the in-group condition perform more collaborative dishonest acts compared to dyads in the out-group condition in a field setting. To this end, we made use of a stronger manipulation of group membership than in our previous study. Nevertheless, we were not able to confirm our expectation, no difference was found in the reported amount of doubles and the average value of Player A's report between the in-group condition and out-group condition.

However, we did replicated the effect of collaborative dishonesty (Barr & Michailidou, 2017; Soraperra et al., 2017; Weisel & Shalvi, 2015; Wouda et al., 2017) outside of the laboratory. Overall, dyads reported a higher amount of doubles than would be expected by chance. When examining both conditions separately, we found this effect in the in-group condition but not in the out-group condition. As the out-group condition only contained 15 dyads, these results should be interpreted with caution. Despite this, (dis)honesty did not differ significantly between the in-group and out-group condition. This could again be explained by a small sample size, as the sample size was nearly identical to the sample size in Study 1.

Moreover, we found no evidence for the effect of dishonesty of Player A (Weisel & Shalvi, 2015). Whereas Player A reported a higher value than expected by chance in general, this effect was only marginally significant. When examining both conditions separately, we observe an honest Player A for both the in-group and out-group condition. In addition, our exploratory analysis indicated that the decision of Player B to report a double was not influenced by the value of Player A's decision. This suggests that both players in both conditions did not collaborate in a dishonest manner. There could be several reasons for the absence of influence of value in this study. In Study 2 players had a subjective incentive (i.e., a prize) to report a high value. In addition, the value of the prize was not explicitly communicated to participants. Both might have led to the absence of influence of value. To support this idea, our exploratory analysis indicated that dyads in Study 1 (which had a monetary incentive to lie) performed more collaborative dishonest acts compared to dyads in Study 2. This seemingly illustrates the importance of a monetary reward for dishonest behaviour.

General Discussion

The current research aimed to investigate whether collaborating with an in-group members results in more dishonest behaviour compared to collaborating with an out-group member. Our results suggest that both the reported amount of doubles and the average value reported by Player A[11] was higher than would be expected according to chance (i.e., in the case of honesty). This replicates the finding that collaborative settings lead people to engage in immoderate dishonest behaviour (Barr & Michailidou, 2017; Soraperra et al., 2017; Weisel & Shalvi, 2015; Wouda et al., 2017). However, the displayed dishonesty did not differ between the in-group and out-group condition. Although it seems that dishonest collaboration was more frequent in in-group compared to out-group collaboration, this finding was not significant and thus we did not find evidence for our pre-registered hypothesis.

An essential prerequisite for the current research is that people experience feelings of group membership. One could argue that the paradigm used in the current research may not have allowed participants to experience feelings of group membership, possibly leading to our null-result, since the group membership manipulation in Study 1 was only partly successful. While participants displayed in-group favouritism in Study 1, they did not identify more with their own group compared to the other group. However, even if participants did experience feelings of group membership (as they did in Study 2), the collaborative context in itself could have had a diminishing effect on the intergroup bias because it provided dyads with a joint goal (i.e., obtaining money or prizes). This could have possibly led to our null-result. A classic study by Sherif and colleagues (1961) showed that having a joint goal leads to more intergroup cooperation (Sherif, Harvey, White, Hood, & Sherif, 1961; see also Gaertner & Dovidio, 2000; Worchel, 1979). The ‘contact hypothesis’ provides further evidence for this idea, as it predicts that the pursuit of a common goal might reduce intergroup conflict and prejudice (Cook, 1985). Therefore, having a joint goal might have led to a reduction in intergroup bias resulting in more collaborative dishonest behaviour, regardless of group membership. Future research might examine whether feelings of closeness toward each other after engaging in dishonest collaboration differ from before engaging in dishonest collaboration, for example whether feelings of closeness increase after performing in the sequential dyadic die-rolling paradigm (Weisel & Shalvi, 2015).

Our theoretical premises in this research were based on four psychological processes: the exposure to dishonest behaviour of others, the willingness to work together, the prosocial interaction and the loyalty principle. The latter three psychological processes presume that collaborative dishonesty is a social process: Behaving in a dishonest manner is partly for the benefit of the other. In hindsight one could argue that in the present research collaborative dishonesty might not have been so social as it measured self-serving dishonesty instead of group-serving dishonesty. Performed dishonest behaviour in the present research only served the personal interest of the individual instead of their groups' interest. Previous research found that oxytocin (i.e., a hormone that fosters altruism and bonding with others) drives group-serving but not self-serving dishonesty. When dishonest behaviour served self-interests only, oxytocin had no effects (Shalvi & De Dreu, 2014). Possibly, it could be that the increase in dishonesty in collaboration (Weisel & Shalvi, 2015; Wouda et al., 2017) cannot be attributed to these social processes, resulting in the absence of the difference in dishonest collaboration between the in-group and out-group condition.

If indeed dishonest collaboration cannot be attributed to social processes, one could examine which other processes might occur in dishonest collaboration. One of these processes could be diffusion of responsibility. Diffusion of responsibility refers to the idea that people within a group feel less responsible for their actions than if they had done similar actions individually (Guerin, 2011). For example, when more bystanders are present at a crime of emergency, none of them would feel responsible for giving aid, resulting in a smaller likelihood that any one of them will intervene (Darley & Latané, 1968). In the case of dishonest behaviour, when many individuals are responsible for a decision, rather than one single individual, they are less likely to take responsibility for their dishonest acts, resulting in an increase in dishonest behaviour (Bandura, 1999). When cooperating in a dishonest manner within a group, people may attribute the performed dishonest behaviour to others. In doing so, people reduce their own responsibility and consequential feelings of guilt (Diener, 1977; Zimbardo, 1969). This reduction in the sense of responsibility might explain why both conditions displayed collaborative dishonesty. Future research could examine the processes that lie at the basis of dishonest collaboration.

The present research has one important limitation. The sample size of both studies was rather small, as the effect size in both studies was smaller than expected. Therefore, it may be that differences in dishonest behaviour in both experiments simply prevailed due to a lack in power. After conducting a power analysis based on our data from Study 1, using the package simr (Green & Macleod, 2016), it was found that future research should have a sample size three times as big. Utilizing a larger sample size, future studies could strengthen the power of the paradigm, and thereby aim to further investigate what the influence is of group membership on the degree to which collaborative dishonest behaviour is carried out. The current research also has positive aspects. Since our second study was conducted in the field, we collected data from a representative sample and replicated the effect of collaborative dishonesty even outside of the laboratory. In addition, both studies were pre-registered.

The present research also raises potential research questions. For example, we found that participants in Study 1 display more collaborative dishonest behaviour compared to participants in Study 2. There could be several explanations for this observed difference. First, this difference might arise from variances in the level of participants' anonymity between both studies. Whereas the partner in Study 1 was anonymous (only the group membership was known), participants in Study 2 knew the personal identity of their partner possibly leading to a decrease in feelings of anonymity. Research indicates that, the more anonymous an individual feels, the easier it is to distance himself from the dishonest behaviour resulting in more dishonest behaviour (Jacobsen, Fosgaard, & Pascual-Ezama, 2018). Likewise, creating the feeling of anonymity by dimming the light in a room or wearing sunglasses made people more inclined to behave dishonestly (Zhong, Bohns, & Gino, 2010). Future research could examine the effects of anonymity in collaborative dishonesty.

Second, the difference in dishonest collaboration between both studies might also arise from variances in the nature of the reward between both studies. While Study 1 used money as a reward for dishonest behaviour, Study 2 used prizes as a reward. Money is a quantitative reward, an amount of money has often a similar value for everybody. In contrast, prizes are a qualitative reward, a prize may have dissimilar value for everybody. In addition, the value of the prize was not explicitly communicated to participants. Together, this may have to led to less dishonest collaboration in Study 2. This idea is strengthened by our findings in Study 2 that especially Player A, having control over the value of the trail, seemingly displayed honest behaviour in both conditions. Similarly, our exploratory analyses indicated that the dishonesty of Player B was not affected by the value of the trial suggesting that the value of the trial was not a trigger to behave in a dishonest manner. Future research could examine whether the nature of the reward influences dishonest decision making in both individual and collaborative contexts.

In sum, the current research is a pioneer research project concerning the role of group membership on dishonest collaboration. Despite that sharing a common group membership did not influence the amount of displayed dishonest acts, the present research project is the first step in examining the influence of sharing a common group membership on dishonest collaboration. The present research did replicate the effect of collaborative dishonesty and shows that the effect generalizes to a sample outside of the laboratory. An next step would be attempting to provide further understanding about the influence of group membership on dishonest collaboration. Since others are frequently involved in our decisions it is important to gain further insight in people's dishonest behaviour in collaborative contexts.

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Footnotes

[1] For Study 1, the analyses on the the average value of Player A's report were not pre-registered.

[2] ORSEE is an Online Recruitment System for Economic Experiments (see www.orsee.org).

[3] Both scores (in-group favouritism and identification) were not normally distributed, therefore we conducted additional Mann-Whitney-Wilcoxon Tests. Since the results were similar, only *t*-test are reported.

[4] When removing scores of two participants that could be influential (indicated by both Cook's distance and DFbeta statistics) similar results were found.

[5] When removing scores of two participants that could be influential (indicated by both Cook's distance and DFbeta statistics) the pattern of results changed notably, Estimate = 0.3110, SE=0.1397; $F(1,39)$ =4.9556 , p = .03186, resulting in a significant difference between in-group-out-group condition in the value of Player A's reported outcome in the proposed direction.

[6] For both conditions the average value of Player A's reported outcome was not normally distributed, therefore we conducted Mann-Whitney-Wilcoxon Tests.

[7] The binomial generalized linear mixed effects analysis of the relationship between reported amount of doubles and in-group-out-group collaboration was adjusted to 10 trials.

[8] When removing scores of four participants that could be influential (two scores were indicated by Cook's distance statistic and two scores were indicated DFbeta statistic) similar results were found.

[9] When removing scores of four participants that could be influential (three scores were indicated by Cook's distance statistic and one score was indicated DFbeta statistic) similar results were found.

[10] Although the average value of Player A's reported outcome was normally distributed for the out-group condition, this distribution was not normal for the in-group condition. To keep both statistical tests as similar as possible, we conducted Mann-Whitney-Wilcoxon-Tests for both conditions.

[11] With the exception of Study 2, where value might not have played a role.

Appendix A

General questionnaire Study 1.

1. I enjoyed being part of my group (ik vond het leuk om tot deze groep te behoren)
    - Anchors: completely disagree – completely agree
2. I identify with this group (Ik identificeer me met deze groep)
    - Anchors: completely disagree – completely agree
3. I would have rather belonged to the other group (Ik zou liever tot de andere groep hebben behoord)
    - Anchors: completely disagree – completely agree