CURRENT RESEARCH IN SOCIAL PSYCHOLOGY

Volume 6, Number 12
Submitted: March 3, 2001
Resubmitted: May 16, 2001
Accepted: May 23, 2001
Publication date: May 23, 2001

INDIVIDUAL-GROUP CONTINUITY IN COOPERATION AND COMPETITION UNDER VARYING COMMUNICATION CONDITIONS

Hein F.M. Lodewijkx
Open University, Heerlen, The Netherlands
Utrecht University, Utrecht, The Netherlands

ABSTRACT

A 2 (Individuals / Groups) X 2 (Communication / No communication) ten-trial Prisoner's Dilemma Game (PDG) study examined effects of repeated communications on the so-called discontinuity effect: the observation that intergroup PDG interactions are more competitive than interindividual PDG interactions. Inconsistent with the discontinuity hypothesis, but consistent with goal-expectation theory, results indicated that repeated communications increased cooperation to an equal extent for individuals and groups; and that groups had stronger cooperative expectations of, and attributed less competitiveness to their opponent, than individuals. Findings suggest an individual-group continuity effect, rather than a discontinuity effect, within the context of repeated PDG interactions and communications between individuals and groups.

[166]
---
[167]

INTRODUCTION

Groups have a bad reputation, even leading to half-jokingly comments by some authors that 'humans would do better without groups' (Buys 1978). Once individuals are submerged in a group, they seem to transform from a Dr. Jekyll into a Mr. Hyde and are driven by the lowest impulses and instincts (LeBon 1895). Only as single individuals, they would act in a civilized, cool, calm, and collected way. In his discussion of mass phenomena, Brown (1954) described this discrepancy between individual and group behavior as an 'apparent discontinuity', suggesting that individuals submerged in groups are more antisocial, domineering, deceitful, hostile, aggressive and competitive compared to isolated individuals.

In their program of research on this 'individual-group discontinuity hypothesis' —the name was borrowed from Brown's (1954) discussion— Insko, Schopler, and colleagues give strong

evidence for the negative image of the social group sketched above. They repeatedly observed that in the context of matrix games, such as the Prisoner's Dilemma Game (PDG) or variations thereof, intergroup behavior is less cooperative and more competitive than interindividual behavior (for reviews e.g. Drigotas, Insko, and Schopler 1998; Insko et al. 1992; Rabbie 1998; Schopler and Insko 1992; Wildschut and Insko, *in press*). In all these studies there was a moderate degree of non-correspondence between own and other party's interests.

In many of the discontinuity studies individuals and groups (or their representatives) were instructed to communicate with each other on each trial of a ten-trial PDG. During these face-to-face communication sessions both parties could suggest non-binding ways to coordinate their choices. In line with the earlier PDG findings of Wichman (1972) these repeated communications often resulted in over 90 per cent cooperation for individuals. Importantly however, for groups these repeated communications were considerably less effective in inducing cooperation. For instance, the effects of communication on individual-group discontinuity were examined in a study by Insko et al. (1993), using a single trial play with a so-called PDG-Alt matrix[1]. Communication in this experiment did not involve face-to face interactions, but the use of an intercom system. A number of reliable main and interaction effects for communication versus no communication and individuals versus groups on the proportion of cooperative, competitive, and 'withdrawal' choices were obtained. Communication increased cooperation between individuals, but not between groups. The no communication condition, compared to the communication condition, produced an increase in withdrawal choices for individuals but not for groups. As predicted, groups were more competitive than individuals and this main effect was not moderated by communication opportunity.

We are, however, doubtful whether results obtained within the context of single trial interactions can be generalized to iterated interactions. For instance, Kelley and Thibaut (1978) have put forward that it is necessary to emphasize differences between single and repeated trial interactions "to counteract the unfortunate tendency for investigators to theoretically analyze a game in terms of 'one-shot-play' and then to be surprised when repeated play does not conform empirically to their analysis" (p. 163-64). Therefore, we decided to examine several of the hypotheses formulated by Insko et al. (1993) in their single trial communication study, but this time using iterated interactions. These hypotheses will be contrasted with predictions derived from goal-expectation theory (Pruitt 1983; Pruitt and Kimmel 1977).

Individual-Group Discontinuity

Schopler and Insko (1992) proposed two main hypotheses to account for the discontinuity effect[2]. According to the schema-based distrust-, or *fear hypothesis*, the effect is caused by the activation of an 'ethnocentric outgroup schema'. They write: "the anticipation of interaction with another group instigates learned beliefs, or *expectations*, that intergroup relations are competitive, unfriendly, deceitful, aggressive and so forth" (*ibid.*, p. 129, italics ours). The outgroup schema is thus based on learned expectations about the competitive nature of intergroup relations. Because of their fear to be exploited by a competitive opponent, groups are inclined not to cooperate. Clearly, it is rational not to cooperate when one beliefs to be facing an untrustworthy, competitive opponent. Regarding the effects of communication, the fear

hypothesis predicts that inter-party communication will induce less cooperation between groups than between individuals because "communication between groups is in the context of the outgroup schema and is thus of low credibility" (Insko et al. 1993, p. 115).

The social support for self-interest -, or *greed hypothesis* holds that groups are less cooperative and more competitive than individuals because groups provide their members with support for the pursuit of their short-term self-interests by acting in a competitive, unfair, and selfish manner. This hypothesis implies that communication will induce less cooperation between groups than between individuals, because groups are more likely to defect from a cooperative agreement in an attempt to exploit the opponent (e.g. Lodewijkx et al. 1999), or to use communication for deceit, as was observed by McCallum et al. (1985) in the first discontinuity study conducted.

[168]
---
[169]

Goal-Expectation Theory

Goal-expectation theory, on the other hand, does not specifically predict individual-group differences in cooperation or competition. According to this theory, self-interest or individualism is the main motivational orientation of parties facing the 'strategic, impersonal environment' of the PDG (Pruitt and Kimmel 1977). It is further proposed that the cooperative responding between parties is the result of both the goal of achieving mutual cooperation and the expectation that the other party will cooperate. Expectations can also be labeled as '*trust*' (Pruitt 1983, p. 111). Importantly, the goal of mutual cooperation and the expectations can vary independently from each other. Only when parties indeed want to achieve the goal of mutual cooperation and have reason to believe that the other party can be trusted —or expected— to cooperate, mutual cooperation between parties will develop. This approach implies differential effects of single and repeated trial interactions on individual-group discontinuity.

From an individualistic point of view, it is rational not to cooperate in a single trial PDG despite any non-binding agreements that might have been reached between parties (Bornstein et al. 1994; Colman 1982). The reason is that in single trial interactions a non-cooperative party will achieve a maximum gain in case the opponent cooperates, and will suffer a minimal loss in case the opponent is non-cooperative. Whereas individualism is associated with non-cooperation in a single trial PDG, it is not in an iterated PDG. In the latter case it is assumed that a 'transformation of motivation' (Kelley and Thibaut 1978; Pruitt 1983) takes place from short-term self-interest to 'enlightened' long-term self-interest, or from non-cooperation to cooperation. In an attempt to maximize their outcomes, the very same underlying individualistic motive will propel parties to opt for non-cooperation in single trial PDG interactions, but to choose for cooperation in iterated interactions. In the latter case the choices made on a given trial do not only affect the outcomes on that trial, but can also influence the outcomes on following trials. In an iterated PDG the future can cast a shadow back upon the present and thereby change the current nature of the interdependence structure between the parties in a way that promotes mutual cooperation (Axelrod 1984; Kelley and Thibaut 1978; Pruitt and Kimmel 1977). In line with this argument, it has been found that the level of cooperation on the final trial of an iterated PDG is lower than the level of cooperation on previous trials. Since no time perspective is present in this situation, this 'end-game effect' (Rabbie and Horwitz 1982) is due to the absence

of cooperative expectations, or trust, and of the decrease in the importance to achieve the goal of mutual cooperation.

[169]
---
[170]

While the earlier PDG literature generally suggests that forms of inter-party communication lead to increased cooperation, especially when parties can both see and hear each other (Deutsch 1973; Miller and Simmons 1974; Radlow and Weidner 1966; Terhune 1968; Wichman 1972), it also suggests that the effects of inter-party communications on the level of cooperation in single trial interactions are mediated by different mechanisms than they are in iterated interactions (see Colman 1982). Communication will increase mutual cooperation in iterated interactions because it permits parties (1) to share and develop insights about the interdependence structure of the PDG; (2) to communicate cooperative intentions; and (3) to warn each other that non-cooperation will be reciprocated. Opportunities to communicate further enable parties (4) to coordinate their choices and (5) effectively reduce the confusion that is inherent to the process of sorting out which part of the opponent's behavior reflects his strategy, and which part reflects the opponent's reactions to one's own actions (Colman 1982; Kelley and Thibaut 1978; Pruitt and Kimmel 1977). All these factors will promote both the long-term goal of mutual cooperation and the expectation that the opponent will strive for this goal, and they will do so to an equal extent for individuals and groups.

In a recent review of the discontinuity studies, Wildschut and Insko (*in press*) provide some evidence for the goal expectation approach. In a PDG study individual versus group conditions were crossed with a manipulation of anticipated future interaction: in one condition participants were told that they would interact for only one trial, in another condition that they would interact for multiple trials. In fact, all participants exchanged PDG choices only once. Expectancies concerning other party's cooperative or competitive choices were assessed after participants made their choice, but before they learned of the opponent's choice. Results revealed a significant interaction effect. When anticipating multiple trials groups expected 70 % cooperation, compared to 47 % in the single trial condition. For individuals, these means were 80 % and 76 %, respectively. Anticipating interacting for multiple trials thus induces cooperation for groups, but not for individuals, whose cooperative tendencies are already very strong. These results are in line with goal-expectation theory and suggest that, in the presence of repeated communication sessions, a continuity effect rather than a discontinuity effect in cooperation between individuals and groups can be expected.

[170]
---
[171]

HYPOTHESES

With respect to PDG choice behavior, the discontinuity hypothesis predicts that groups will show less cooperation than individuals (H. 1). Both the fear and greed hypotheses[3] predict an individuals / groups by communication / no communication interaction on the level of cooperation, such that communication will increase cooperation between individuals to a greater extent than it will between groups (H. 2). Goal-expectation theory on the other hand predicts that

communication will increase cooperation and will do so to an equal extent for groups and individuals (H. 3). The same theory (see also Axelrod 1984) proposes that short-range thinking ordinarily leads to non-cooperation and that cooperation usually results from long-range thinking. Because the 'shadow of the future' is absent on the final trial of an iterated PDG, it is predicted that the level of cooperation on this final trial will be lower than the level of cooperation on the previous trials (H. 4). The discontinuity hypothesis would not predict such an end-game effect.

Schopler and Insko's (1992) fear hypothesis proposes that the discontinuity effect is partially caused by the instigation of an ethnocentric outgroup schema. Similar to the results reviewed by Wildschut and Insko (*in press*), participants' anticipated choices of the other party were assessed, prior to any actual interaction or communication between parties. The fear hypothesis predicts that groups will expect less cooperation from their opponents, compared to individuals (H. 5). In order to assess the validity of these anticipated choices, individuals and groups were further requested to fill out a questionnaire pertaining to the reasons or motives they believed the other party had for making this choice. The fear hypothesis predicts that groups will expect their opponent to be more competitively motivated than individuals (H. 6).

METHOD

Participants and Design

Participants were 72 students of Utrecht University, The Netherlands (12 males, 60 females). They were recruited by means of sign-up sheets that were put out in different buildings of the campus. The study was presented as an 'interaction experiment'. Apart from their participation fee of 7.50 Dutch guilders (about 4 US$), participants could keep the money they earned during the experiment, which, on average, amounted to Fl. 6.90 (3.50 US$).

Two independent variables were varied: *Individuals* versus *Groups* and *Communication* versus *No communication*. The groups consisted of dyads. The group condition was modeled after the group-all condition of the Insko et al. (1987; 1988) studies, in which group members had to reach a consensus on their group choice and in which they collectively interacted with their opponent. The communication condition was manipulated by comparing the interaction of parties that engaged in between-party, face-to-face communication on each trial of the ten-trial PDG with the interaction of parties that had no such opportunities.

[171]
---
[172]

Procedure

We closely followed the procedure as described by Insko et al. (1987). After participants reported to the experiment, they were randomly assigned to Party 1 or Party 2. Following this assignment, participants were seated in their 'home' rooms. By means of written instructions, it was made clear to them that they were in a situation in which they could earn money. The instructions included a copy of the PDG pay-off matrix, adapted from Schopler and Insko (1992). The outcome values were 75 / 75 Dutch cents for the cooperative-cooperative (C-C) combination, 45 / 85 cents for the cooperative-competitive (C-D) combination (or the reverse for

the competitive-cooperative D-C combination), and 50 / 50 cents for the competitive-competitive combination (D-D). Participants would interact with the other party on ten trials, each trial with the same outcome matrix. Individuals were told that the numbers in the matrix represented amounts of money that could be earned by each party, groups were told that the numbers represented amounts of money that could be earned by each individual member of both groups. Thus, there were equal amounts of money at stake for each individual participant in the experiment. Before reading the procedural details participants' understanding of the contingencies in the PDG matrix was tested by letting them exchange choices with the experimenter twice. Regardless of participants' choices the experimenter always responded with a cooperative choice on the first occasion and with a non-cooperative choice on the second one. No pay-offs were at stake during this quiz.

The experiment took place in a row of three separate rooms located on one side of a hallway. The communication sessions took place in the central room. Before the first communication session participants were asked to indicate whether they expected a cooperative or a non-cooperative choice of their opponent and to fill out a questionnaire pertaining to the reasons and motives of the other party. Group members had to reach a consensus on their answers to these questions. Participants in the *Group / Communication condition* started each trial with a twenty second planning period, discussing the proposal they were going to make to the other group. They were then directed to the central room where they could exchange proposals and discuss possible courses of action for fifteen seconds. All group members were engaged in these communication sessions. After this, the groups returned to their 'home' rooms where they had another fifteen seconds to reach a decision upon their choice for that trial and record it in writing. Next, both groups returned to the central room where their choices were announced by the experimenter. Back in their 'home' rooms, own and other party's choices were recorded, including the amount of money gained or lost on the trial. At the end of each trial participants received the money they had earned. Every group member was paid individually. The other three conditions followed the same procedure with slight variations. In the *Individual / No communication* - and the *Individual / Communication conditions* no intra-party planning and discussion was possible. Instead, individuals were given twenty seconds to think about their choice. In the *No communication conditions*, where there were no opportunities for the parties to communicate with each other, participants were given fifteen seconds to think about their choice. In these conditions choices and proposals of both parties were exchanged by the experimenters.

[172]
---
[173]

Dependent Variables

Our primary focus is on extent of mutual cooperation assessed across trials. When one or both of the parties made a non-cooperative D-choice on a given trial this choice was assigned 0, only when both parties made a cooperative C-choice (i.e. mutual cooperation) this choice was assigned 1. This measure of mutual cooperation potentially varies between 0% when one or both of the parties made non-cooperative choices on all the 10 trials and 100% when mutual cooperative choices were made by the parties on all the ten trials. To test the 'end-game effect' similar measures were computed for the first nine trials and the last, tenth trial. The third dependent variable constituted participants' expectations about other party's choice. Participants' reasons or motives that guided these expectations constituted a last set of dependent variables.

Participants were asked to tick the 7-point items (1 = this reason is unimportant; and 7 = this reason is very important) of a questionnaire consisting of the main motivational orientations distinguished in the literature (Kelley and Thibaut 1978). Items included: Cooperation or *max. joint* ('The other group [party] wants to earn as much money as possible together with us [me]'). Individualism or *max. own* ('The other group [party] wants to earn as much money as possible for themselves [itself]'). Competition or *max. rel*. ('The other group [party] wants to beat us [me]'). Fairness or *min. diff*. concerns an equal sharing of outcomes between parties ('The other group [party] wants to earn an equal amount of money'). The questionnaire further included an item that assessed opponents' expected fear or *defensiveness* ('The other group [party] wants to defend itself against our [my] actions'), as well as an item assessing opponent's *risk aversion* ('The other group [party] does not want to take a risk').

RESULTS

The mutual cooperation measure was included in a 2 (individuals / groups) X 2 (communication / no communication) ANOVA. The discontinuity hypothesis predicts that intergroup behavior is less cooperative than interindividual behavior (H. 1). Contrary to this prediction the analysis revealed no reliable main effect for individuals versus groups, $F < 1$. Table 1 shows the mean proportions of mutual cooperation[4].

[173]
---
[174]

Table 1. Mean Proportion of Mutual Cooperation, End-Gaming and Other Party's Expected Cooperation for Individuals and Groups in the No Communication (No Com.) and the Communication (Com.) Conditions.

	Individuals		**Groups**	
	No Com.	**Com.**	**No Com.**	**Com.**
Percent Mutual Cooperation	29	73	28	82
Percent End-Gaming	-32	-49	-13	-47
Percent Other Party's Expected Cooperation	57	43	71	80

ANOVA further yielded a strong main effect for communication versus no communication, $F(1, 21) = 15.92$, $p < .001$, revealing that, consistent with goal-expectation theory (H. 3), communication increased the level of mutual cooperation to an equal extent for individuals and groups. Noteworthy, absence of these opportunities to communicate decreased the level of mutual cooperation for individuals and groups also to the same extent. The interaction effect between the group and communication factors that was predicted by Schopler and Insko's (1992) fear and greed hypotheses (H. 2) proved to be non-significant, $F < 1$.

Support was found for the end-gaming hypothesis (H. 4). Mean proportions of mutual cooperation for the first nine trials and for the last, tenth, trial were included as a within-subjects trials factor in a 2 X 2 X 2 repeated measure, mixed ANOVA. The analysis only yielded a main effect for the trials factor, $F(1, 21) = 7.20$, $p < .05$. This main effect is best presented by the 'end-

game' difference score in Table 1. The scores indicate that the average level of mutual cooperation is 35 per cent lower on the tenth trial than on the combined nine previous trials. The strength of this observed end-game effect does not differ between conditions, *F*s < 1, implying that the end-game effect applies equally to individuals and groups, irrespective of opportunities to communicate.

Table 1 further shows mean proportions of other party's expected cooperation. In contrast to the prediction based on the fear hypothesis —i.e. that groups expect less cooperation from their group opponents than do individuals from their individual opponents (H. 5)—, results indicate that groups expect more cooperation from their opponents compared to individuals, $F(1, 46) = 4.06$, $p < .05$. No other effects involving other party's expected choice behavior were statistically reliable.

[174]
---
[175]

With respect to the questionnaire data pertaining to other party's expected motives a 2 X 2 ANOVA provided no support for the fear hypothesis that groups expect their opponents to be more competitively motivated (*max. rel.*) than individuals (H. 6). On the contrary, Table 2 reveals that groups expected their opponents to be less competitively motivated than individuals, $F(1, 46) = 3.90$, $p < .055$.

Some additional results were yielded by the 2 X 2 ANOVAs to which the items of the questionnaire were subjected. First, no main effects for communication were obtained. Second, results of individual-group main effects (*p*s < .05) can be summarized as follows: Groups expected their opponents to be less individualistic, $F(1, 46) = 5.69$, and more risk averse, $F(1, 46) = 9.60$, compared to individuals.

Table 2. Mean Ratings of Other Party's Expected Motivational Orientations for Individuals and Groups in the No Communication (No Com.) and the Communication (Com.) Conditions.

	Individuals		**Groups**	
	No Com.	**Com.**	**No Com.**	**Com.**
Individualism (*Max. Own*)	6.21	6.00	4.38	5.40
Cooperation (*Max. Joint*)	4.79	4.00	4.50	4.95
Competition (*Max. Rel.*)	4.29	3.93	2.75	3.05
Fairness (*Min. Diff.*)	4.57	3.64	5.17	4.65
Defensiveness	3.17	3.14	3.96	2.95
Risk Aversion	3.79	3.00	5.42	4.90

Note: The higher the score, the more important the reason / motivational orientation.

To examine the fear and greed hypotheses in more detail, a 2 X 2 X 6-mixed MANOVA was performed, treating the six questionnaire items as levels of a within-subjects factor. The analysis yielded a reliable within-subjects effect, $F(5, 230) = 6.84$, $p < .01$, indicating overall differences among responses to the items of the questionnaire across levels of the group and communication independent variables. However, this main effect was qualified by a significant interaction effect between individuals versus groups and the within-subjects variable, $F(5, 230) = 3.97$, $p < .05$. Contrary to the fear and greed hypotheses, Bonferroni controlled within-cells paired comparisons between the six items of the questionnaire revealed that groups expected their opponent to be more risk averse and fair (*min. diff.*) rather than defensive or competitive (*max. rel.*), all comparisons $t(21) > 2.50$, $p < .05$. Further, groups expected their opponents to be more individualistic (*max. own*) and cooperative (*max. joint*) rather than competitive (*max. rel.*), all comparisons $t(21) > 2.45$, $p < .05$. Individuals, on the other hand, expected their opponent to be primarily motivated by individualism (*max. own*), more so than by the other five motives, all comparisons $t(27) > 3.65$, $p < .01$. The relative importance of individualism for individuals and groups in the present PDG study is in agreement with goal-expectation theory.

[175]
---
[176]

DISCUSSION

In the present study a similarity or continuity was observed in the PDG choice behavior of individuals and groups in conditions under which they had repeated opportunities to communicate with their opponent or not. We failed to replicate the discontinuity effect in circumstances that allowed for free, spontaneous interaction between parties, that were composed of real participants, who had complete feedback regarding their choices and outcomes. These are all variables that, according to Schopler and Insko (1992), strongly bolster individual-group discontinuity.

The groups in the current study consisted of only two members which could be a reason why no differences in competition were obtained between our individuals and groups. However, Insko et al. (1993) note that "two-on-two relations are markedly more competitive than one-on-one relations, with three-on-three and four-on-four relations producing progressively smaller differences" (p. 109). Thus, differences in competition between individuals and groups can reliably be detected by contrasting individuals with dyads. Therefore, the size of the groups used in the current study cannot explain the null-results obtained for the discontinuity hypothesis.

As predicted by goal-expectation theory (Pruitt and Kimmel 1977), but contrary to the findings obtained by Insko et al. (1993) in their single trial communication study, repeated face-to-face inter-party communications markedly increased the amount of mutual cooperation and did so to an equal extent in interindividual and intergroup relations. Noteworthy, in anonymous circumstances, that is, in the absence of communication opportunities, individuals and groups decreased their cooperation also to the same degree. First, all this substantiates our assumption that findings obtained within the context of a single trial PDG cannot be easily generalized to iterated play of the PDG (Kelley and Thibaut 1978; Bornstein et al. 1994). Second, when individuals and groups anonymously face the ‘impersonal, strategic environment of the PDG’ (Pruitt and Kimmel 1977), individuals are as capable of non-cooperation as are groups, a result

that is in agreement with predictions of goal-expectation theory. Also consistent with this theory is the finding that the main motivational orientation in interindividual relationships is *max. own* or individualism. Similar findings, for individuals as well as groups, were obtained by Lodewijkx et al. (1999) in a study examining the effects of incentives to cooperate (*monetary* versus *symbolic outcomes*) on individual-group discontinuity. This suggest that the strong cooperation observed in interindividual relationships in the discontinuity studies is perhaps not only due to internalized norms to accommodate and to distribute outcomes in a fair and equitable way, as proposed by Schopler and Insko (1992). Apparently, 'enlightened' self-interest may also account for the strong cooperative behavior of the individuals observed within the context of iterated PDGs.

[176]
---
[177]

The only significant effects involving individuals versus groups speak against the discontinuity hypothesis and, more specifically, the schema-based distrust, or fear, hypothesis. First, groups expected their opponents to be more cooperative on the first trial relative to individuals. Second, the individuals versus groups main effect observed on other party's expected motives indicated that groups attributed less competitiveness and more risk aversion to their opponent than individuals. Third, analyses performed within the groups and individuals conditions separately, revealed that groups perceived their opponents to be more individualistic (*max. own*) and cooperative (*max. joint*) rather than competitive (*max. rel.*), and more risk averse and fair (*min. diff.*) rather than defensive or competitive (*max. rel.*).

A limitation of the present study could be that we failed to detect the discontinuity effect due to a lack of statistical power. The number of observations in the present study is small, limiting the chances of detecting statistically reliable interaction effects as predicted in the Insko et al. (1993) communication study. However, Insko, Schopler and colleagues repeatedly note that the discontinuity effect is a 'descriptively large' effect, suggesting that it is a robust social psychological phenomenon that can be fairly easily detected with a relatively small number of observations. In view of their own argument, we therefore do not think that the null-results obtained for the discontinuity effect in the current study is due to a lack of statistical power. Moreover, based on the same relatively small number of observations, the present pattern of results clearly indicates that goal-expectation theory proved to be a valid theory to explain the cooperative and competitive responding of both individuals and groups.

The present data contradict predictions of social identity theory (Tajfel and Turner 1986) that stresses the categorization based, competitive nature of intergroup relations. Our data, however, are consistent with the 'common ingroup identity model' of Gaertner, Dovidio, Anastasio, Bachevan and Rust (1993). The intergroup communication sessions could have led the members of the two separate groups to perceive themselves as belonging to a single, superordinate category or ingroup. Consistent with the Gaertner et al. studies (1993), this recategorization leads to the perception of a 'common ingroup', which, on its turn, could have induced the strong collaboration and cooperation among the members of both groups. In a similar vein, the same recategorization / common ingroup identity perspective may also account for the strong cooperation observed between the two individuals in the communication condition in the present study.

FOOTNOTES

1. A PDG-Alt matrix is a PDG matrix with a third 'withdrawal' choice added to the cooperative and non-cooperative choices. The withdrawal choice produces outcomes that are intermediate to those in the mutually cooperative cells and the mutually non-cooperative cells, independent of the opponent' s choice.

[177]
---
[178]

2. Other hypotheses relate to (1) the effects of lessened identifiability in intergroup relations to induce competition; and (2) to effects of procedural interdependence imposed upon groups by the requirement to make unanimous decisions (i.e. consensus rule). These hypotheses are beyond the scope of the present study (but see Wildschut, Lodewijkx, and Insko, 2001, *in press*).

3. According to Insko et al. (1993) the finding that communication increases cooperation between individuals to a greater extent than it does between groups is evidence for the fear hypothesis, since this hypothesis predicts that groups are less likely to believe each other's cooperative proposals, and are more likely to defend themselves against the exploitation that they fear. As we have stated before, however, the greed hypothesis also predicts that communication will increase cooperation between individuals to a greater extent than between groups, because groups are more likely than individuals to defect from an agreement in order to exploit the opponent, or to use communication for deceit.

4. Due to intra- and inter-party communications, observations are not statistically independent. Therefore, statistical analyses were performed using weighted observations. The unit of analyses is the interaction between parties, for groups the weight =.25, for individuals the weight = .50. Weighted observations were 7 for the *Individual / Communication condition* , 7 for the *Individual /No communication condition*, 5 for the *Group/ Communication condition* and 6 for the *Group/No communication condition*. Assessments of other's expected choice and motivational orientations took place before the inter-party interaction, therefore another weight factor was applied; 1.00 for individuals, and 0.50 for groups. Weighted cell *n*s this time are 14, 14, 10, and 12 respectively.

REFERENCES

Axelrod, R. (1984). *The Evolution of Cooperation*. New York, NY: Houghton Mifflin.

Bornstein, G., I. Evren, and H. Goren (1994). "The effect of repeated play in the IPG and IPD team games." *Journal of Conflict Resolution*, 38:690-707.

Brown, R.W. (1954). "Mass Phenomena." In G. Lindzey (Ed.), *Handbook of Social Psychology* (Vol. 2). Cambridge, MA: Addison-Wesley.

[178]
---
[179]

Buys, C. J. (1978). "Humans would do better without groups." *Personality and Social Psychology Bulletin*, 4:123-5.

Deutsch, M. (1973). *The resolution of conflict: Constructive and destructive processes*. New Haven, CN: Yale University Press.

Colman, A. M. (1982). *Game theory and experimental games*. New York, NY: Pergamon Press.

Drigotas, S. M., C. A. Insko, and J. Schopler (1998). "Mere categorization and competition: A closer look at social identity theory and the discontinuity effect." In S. Worchel, J. F. Morales, D. Páez, and J. C. Deschamps (Eds.), *Social Identity. International Perspectives* (pp. 181-198). London: Sage Publications.

Gaertner, S., J. F Dovidio, P. A. Anastasio, B. A. Bachevan, and M. C. Rust (1993). "The common ingroup identity model: recategorization and the reduction of intergroup bias." In W. Stroebe and M. Hewstone (Eds.), *European Review of Social Psychology* (Vol. 4). Chichester: Wiley

Insko, C. A., R. H. Holy, R. L. Pinkley, G. Hong, R. Slim, G. Dalton, Y. Lin, P. P. Ruffin, G. J. Dardis, P. R. Bernthal, and J. Schopler (1988). "Individual-group discontinuity: the role of a consensus rule." *Journal of Experimental Social Psychology*, 24:505-519.

Insko, C. A., R. L. Pinkley, R. H. Hoyle, B. Dalton, G. Hong, R. M. Slim, P. Landyr, B. Holton, P. F. Ruffin, and J. Thibaut (1987). "Individual versus group discontinuity: The role of intergroup contact." *Journal of Experimental Social Psychology*, 23:250-267.

Insko, C. A., J. Schopler, J. Kennedy, K. A. Dahl and S. M. Drigotas (1992). "Individual-group discontinuity from the differing perspectives of Campbell's realistic group conflict theory and Tajfel and Turner's social identity theory." *Social Psychology Quarterly*, 55:272-291.

Insko, C. A., J. Schopler, K. A. Graetz, S. M. Drigotas, J. Kennedy, C. Cox and G. Bornstein (1993). "The role of communication in interindividual-intergroup discontinuity." *Journal of Conflict Resolution*, 37:108-138.

Kelley, H. H. and J. W. Thibaut (1978). *Interpersonal relations. A theory of interdependence*. New York: John Wiley.

LeBon, G. (1895). *Psychologie des Foules*. [Translation: *The Crowd*]. London: Unwin.

Lodewijkx, H. F. M., R. T. Wildschut, J. E. M. M. Syroit, L. Visser, and J. M. Rabbie (1999). "Competitiveness between individuals and groups: Do incentives matter? A group adaptiveness approach." *Small Group Research*, 30(4):387-404.

McCallum, D. M., K. Harring, R. Gilmore, S. Duenna, J. Chase, C. A. Insko and J. W. Thibaut (1985). "Competition between groups and between individuals." *Journal of Experimental Social Psychology*, 21:301-320.

Miller, G. R. and H. W. Simmons (1974). *Perspectives on communication in interpersonal conflict*. Englewood Cliffs, NJ: Prentice Hall.

Pruitt, D. G. (1983). "Experimental gaming and the goal / expectation theory." In H.H. Blumberg, A.P. Hare, V. Kent and M. Davis (Eds.), *Small groups and social interaction* (Vol. 2, pp. 107-121). New York: John Wiley and Sons.

Pruitt, D. G. and M .J. Kimmel (1977). "Twenty years of experimental gaming: Critique, synthesis, and suggestions for the future." *Annual Review of Psychology*, 28:363-392.

Rabbie, J. M. (1998). "Is there a discontinuity or a reciprocity effect in cooperation or competition between individuals and groups." *European Journal of Social Psychology*, 28:483-507.

Rabbie, J. M. and M. Horwitz (1982). "Conflicts and aggression among individuals and groups." In H. Hiebsch, H. Brandstätter and H. H. Kelley (Eds.), *Social psychology* (pp. 99-106). Amsterdam: North Holland Publishing Company.

Radlow, R. and M. F. Weidner (1966). "Unenforced commitments in 'cooperative' and 'non-cooperative' nonconstant-sum games." *Journal of Conflict Resolution*, 10:497-505.

Schopler, J. and C. A. Insko (1992). "The discontinuity effect in interpersonal and intergroup relations: Generality and mediation." In W. Stroebe and M. Hewstone (Eds.), *European Review of Social Psychology* (Vol. 3, pp.121-151). New York: John Wiley.

Tajfel, H. and J. C. Turner (1986). "An integrative theory of social conflict." In S. Worchel and W. Austin (Eds.), *The psychology of intergroup relations*. Chicago: Nelson Hall.

Terhune, K. W. (1968). "Motives, situation and interpersonal conflict within the Prisoner's Dilemma." *Journal of Personality and Social Psychology, Monograph supplement*, 8:1-24.

Wichman, H. (1972). "Effects of isolation and communication on cooperation in a two-person game." In L. S. Wrightsman, J. O'Connor, and N. J. Baker (Eds.), *Cooperation and competition: Readings on mixed-motive games* (pp. 197-206). Belmont, CA: Brooks/Cole Publishing Company.

Wildschut, T, and Insko, C. A. (*in press*). "The perception of outgroup threat: Content and activation of the outgroup schema." In V. Yzerbyt, C. M. Judd, and O. Corneille (Eds.), *The*

psychology of group perception: Contributions to the study of homogeneity, entitativity, and essentialism. Philadelphia: Psychology Press.

Wildschut, T., H. F. M. Lodewijkx and C. A. Insko (2001, *in press*). "Toward a reconciliation of diverging perspectives on interindividual-intergroup discontinuity: The role of procedural interdependence." *Journal of Experimental Social Psychology*.

AUTHOR BIOGRAPHY

Hein Lodewijkx received his Ph.D. in social psychology at Utrecht University, The Netherlands. He is currently an assistant professor at the same university and at the Open University, Heerlen, The Netherlands, teaching introductory psychology, intergroup relations and research methodology. His research interests include intergroup conflict and aggression, group productivity, group initiations, and justice in organizations. Address correspondence to Hein Lodewijkx, Department of Social and Organizational Psychology, Utrecht University, P.O. Box, 3508 TC, Utrecht, The Netherlands. Telephone: 31.30.2534937. Fax: 31.30.2537584. E-mail: H.Lodewijkx@fss.uu.nl; lodex@wanadoo.nl (home); Hein.Lodewijkx@ou.nl.