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Behavioral (In)tolerance of Equality Violation in Social Dilemmas: When Trust Affects Contribution Decisions after Violations of Equality

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In public good dilemmas, people often coordinate their decisions by applying the equality rule. Prior research has shown that if one member violates equality, negative emotions emerge among the other group members. In two experimental studies we investigated whether the presence of a violator also affects contribution decisions. A first experiment demonstrated that a violation of equality does not always influence people's contributions. Even after an equality violation, group members continued to base their decisions on the equality rule if they faced a social dilemma with the same group members. But when group members faced a social dilemma with only the violator of equality, contributions were lowered. Experiment 2 showed that this is especially true for low trusters.

KEYWORDS equality, fairness, social dilemmas, trust

People often face situations in which their personal interests collide with the collective interest. Such situations are referred to as social dilemmas (for an overview on social dilemmas, see Komorita & Parks, 1994). An example of a social dilemma is the public good dilemma. Public goods are characterized by the fact that individual group members can consume the public good even if they did not contribute anything to its provision. As a consequence, group members may reason that they are better off by not contributing to the public good.

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The risk of course is that contributions will be negligible. A situation in which the total of individual efforts or contributions has to surpass a certain threshold in order to provide the public good (e.g. in case of the provision of public parks or social events) is often called a step-level public good dilemma. If group members decide to withhold contributions in such a dilemma, this could then even mean that the public good will not be provided.

In reality, however, people are often willing to contribute to the provision of public goods. In step-level public good dilemmas, it is frequently found that people base their decision behavior on the equality rule (Messick, 1993; Stouten, De Cremer, & Van Dijk, 2005; Van Dijk & Wilke, 1995). This rule prescribes that each group member should contribute an equal share of the threshold needed for the provision of the public good. Adherence to the equality rule, even in situations where people have to make their decisions independently and anonymously (i.e. the typical social dilemma setting), is generally interpreted as an attempt to tacitly coordinate behavior (cf. Schelling, 1980; for a recent overview on tacit coordination in social dilemmas, see Van Dijk & De Cremer, 2006). Equality is an efficient coordination rule, because it is easy to use, and if everyone contributes equally, then this situation will result in the provision of the public good. In addition to being an efficient rule, equality is also a rule that people consider fair (Stouten et al., 2005). That is, when people contribute an equal share, this distribution emphasizes people's equal status and respect for one another (see Miller, 2001).

Previous research on the use of the equality rule has predominantly focused on the apparent popularity of the rule; that is, on the fact that in symmetric dilemmas (e.g. a social dilemma in which outcomes are equally allocated) the vast majority of people seem willing to contribute an equal share of the threshold (e.g. Stouten et al., 2005; Van Dijk & Wilke, 1995; see also Allison & Messick, 1990; Samuelson & Allison, 1994). Although this emphasis is understandable because it reveals the potential benefits of tacit coordination, we wish to argue that it is equally important to focus on the fact that apparently a small minority of the people do *not* adhere to equality. Thus, we are interested in looking at how people will react when they know that one of the members in the group has deviated from equality by contributing less than an equal share. Will the others be behaviorally tolerant of such behavior or will the group reciprocate rule-breaking behavior?

Violating the equality principle

Although equality is a coordination rule to which people often adhere when making decisions in public good dilemmas, research indicates that not everyone may contribute their equal share (e.g. Kerr, 1983). So how do people respond to such a violation of equality? It is likely that violating a morally important coordination rule (see Stouten et al., 2005), such as the equality rule, results in people's disapproval. Indeed, research has shown that if one group member violates equality by contributing less than an equal share, people show *emotional intolerance* in the sense that they react in anger and irritation (see Stouten et al., 2005; Stouten, De Cremer, & Van Dijk, 2006). This suggests that group members expect other group members to adhere to the equality rule, and when this expectation or trust is violated, people are emotionally intolerant. However, do these findings necessarily imply that people will also show *behavioral intolerance* to such a violation in a way that they will restrict their contributions in subsequent public good decisions?

It might well be that, as for the *behavioral* reactions to low contributions, people react negatively to violations of equality because previous theorizing and research have primarily acknowledged the possibility that 'defection breeds defection' (for a recent overview on reactions to defection in social dilemmas, see Van Dijk, De Cremer, Mulder, & Stouten, 2008). By lowering their contributions, people may avoid being the sucker, and suffering the inequity of paying more but receiving no more than the defecting other (Kerr, 1983). Moreover, if people's trust is violated due to an equality violation by another group member, people may reciprocate this behavior and decide no longer to contribute to the provision of the public good.

While seemingly logical, there is a problem with such behavioral reactions. That is, in social dilemma settings such reactions are often nonspecific in the sense that, by withholding or lowering contributions, people not only negatively affect the violator's outcomes but also the outcomes of the other group members who might be willing to contribute. Withholding contributions in a subsequent social dilemma would hurt the other group members as well, and people may not be willing to do this (see e.g. Dawes, 1980; Lahno, 1995; Tinsley, O'Connor, & Sullivan, 2002). That is, because only one group member has violated equality, people may still trust the others and, hence, do not want to hurt these group members (see also Ouwerkerk, Kerr, Van Lange, & Gallucci, 2005). In this case, we argue, people may decide against lowering their own contribution, and opt for continued adherence to the equality rule.

Hence, we argue that although people have been shown to be emotionally intolerant of violations of equality (Stouten et al., 2005, 2006), these findings may not necessarily translate in behavioral intolerance such as withholding one's contributions to the public good. That people may show some behavioral tolerance of observed defection can be deduced from earlier findings by Chen and Bachrach (2003). These authors showed that people are only increasingly likely to reduce their contributions when more group members decide to defect (that is, one versus two defectors). Extrapolating this finding to the issue of equality violation rather than mere defection, we suggest that people may be somewhat tolerant toward prior violations of the equality rule as long as the number of violators is low, e.g. if only one group member violated the equality rule (as is the case in the present research; see also Stouten et al., 2005, 2006).

The central issue we address is how one should interpret such behavioral tolerance of contribution behavior. One possibility is that people are behaviorally tolerant toward the member violating the equality rule because they give the violator a second chance. As we reasoned above, however, a viable alternative explanation is that people would want to get back at the violator, but that they are behaviorally tolerant because they do not want to hurt the interests of the others in the group by reducing their contribution.

To examine these two possibilities, we had participants decide on their contributions in a four-person symmetric public good dilemma. In this initial dilemma we expected group members to adhere to the equality rule (cf. Stouten et al., 2005). After this, we informed them that one of their fellow group members had contributed less than an equal share of the threshold. Our main interest was how this feedback would affect their subsequent decisions. We presented them with two additional decisions. First we presented them with a public good dilemma *with the same four members* (i.e. the entire group condition) to see whether they would show behavioral tolerance, that is, to see whether participants would again adhere to the equality rule. As we already stated above, we had two reasons to expect continued adherence: (1) participants might want to give the violator a second chance, or (2) they might again turn to the equality rule because they would not want to hurt the others in their group. To distinguish between both explanations, we decided to also present the participants with a two-person public good dilemma *with the alleged violator* (i.e. the violator-only condition). We reasoned that if the main explanation for continued adherence were to give the violator another chance, we should observe that people would be willing to contribute in the entire group condition *and* in the violator condition. Thus, no differences should be expected between contributions in the entire group and in a group with only the violator. Alternatively, if the main explanation were that participants refrain from getting back at the violator because they do not want to hurt the others in their group, one would expect decisions to differ between the entire group condition and the violator-only condition: contributions should be lower in the violator-only condition than in the entire group condition.

Experiment 1

In the first experiment, we studied behavioral tolerance of a violation of equality as a function of the composition of the group. After being presented with a four-person step-level public

good dilemma, participants learned that one of the group members had contributed less than an equal share. Subsequently participants faced two new step-level public good dilemmas, one with the entire four-person group (entire group condition), and one only with the alleged violator (violator-only condition).

Our main interest was in the pattern of contributions for the entire group condition and the violator-only condition. If both showed continued adherence to the equality rule, this would provide support for the notion that people may be behaviorally tolerant because they are willing to give the violator another chance. If continued adherence to the equality rule were only observed in the entire group condition, this would provide support for the notion that people are behaviorally tolerant because they do not want to hurt the other group members.

In addition to the behavioral measures of contributions to the public good, we also measured in both settings to what extent the participants trusted the violator, and to what extent they expected the group to succeed in providing the public good. First of all, violating equality should imply that people's trust is violated (as the positive expectation of all group members adhering to the normative decision rule of equality is violated). As a result, one will be less trustful toward the violator and will not expect that his or her own contribution will be sufficient to provide the public good (Axelrod, 1984). This process should lead to a reduced expectation for success in the violator-only group. In the entire group condition, we anticipated that expectations for success would be higher because although participants might show reduced trust toward the violator, they might still expect the others to contribute more. And if so, this might induce group members to contribute in the entire group condition.

Method

Participants and design

Participants were 81 undergraduate psychology students who participated in exchange for course credit. Participants were approached by the experimenter and asked whether they were willing to participate in a paper-and-pencil study. If they agreed, they were given a questionnaire.

Participants read a scenario in which they, together with three other students, chose to follow a departmental course at their university. The description we gave of the course was consistent with the characteristics of a social dilemma. For example, regardless of their own contribution students could not be excluded from the public good that the course generates (i.e. non-excludability). It was said that the university would only continue with the course if the participants paid sufficient registration fees. Participants were said to possess 500 Euros that they had earned from a student job during the previous academic year, which they could use to sign up for the course. If a total of 1000 Euros on registration fees were paid, the course would take place.[1] Thus, the threshold in this dilemma situation was 1000 Euros. If the total contributions met the threshold, the university then would be certain that the course would take place and a bonus of 1600 Euros would be awarded and divided equally among all participants. However, if the total contributions fell below the threshold, all individual investments would be lost. Then, participants were cued for their understanding of the task. All participants answered these questions correctly.

After explaining the rules of the social dilemma situation, participants were asked how much they expected each group member to invest (expectation first contribution). Then, participants themselves decided how much of their personal budget they wished to invest (first contribution). Thereafter, participants learned about the other group members' contributions: They learned that two members of the group had contributed 250 Euros (i.e. they used the equality rule) and the fourth group member had contributed 50 Euros. At this point of time, participants were informed that the group had failed to reach the threshold (this procedure is taken from Stouten et al., 2005, 2006, and is known to elicit strong negative emotions and retributive reactions). Then, participants were asked whether they trusted the group member who had contributed 50 Euros (trust violator),

and whether they trusted the group members who both had contributed 250 Euros (trust others; both on a 7-point scale: 1 = not at all, 7 = very much so).

The entire group condition Further, participants learned that there was another opportunity to follow the same course with the same group members at a different time. Participants again had the opportunity to contribute for this course (contribution entire group). Again, they possessed a personal budget of 500 Euros, and if the group contributed a total of 1000 Euros, the university would award 1600 Euros, which would then be divided equally among the group members.

Before participants made their decision, they were asked whether they thought the group would succeed in contributing sufficiently (sufficient contributions entire group), and whether they thought the group member who had contributed 50 Euros would contribute sufficiently (sufficient contributions violator). Both questions were answered to on a 7-point scale: 1 = not at all, 7 = very much so).

The violator-only condition Then participants were presented with a situation in which they also had to enroll for another course. However, only the participant and the fourth member of the group (the alleged violator) signed up for this course. Also, for this course, group members had to contribute a sufficient amount of money in order to permit the course to take place. If the group contributed 500 Euros, the university would be willing to support the course and would award 800 Euros, which would be divided equally among the group members. As was previously the case, each group member possessed a personal endowment of 500 Euros. Then, participants again were cued for their understanding of the task. All participants answered these questions correctly.

Before participants made their decision, we assessed whether they thought the group would succeed in contributing sufficiently (sufficient contributions violator-only group), and to what extent they trusted the other group member (trust violator-only group). Both were answered on a 7-point scale: 1 = not at all, 7 = very much so. Afterwards, participants were debriefed and thanked for their participation.

Results

Expectations

First of all, in the first contribution session a majority of participants expected (expectation first contribution) that group members would adhere to the equality rule (87.7%).

Further, with respect to subsequent decisions, a one-sample *t*-test showed that participants had low expectations (in comparison to the midpoint) that the violator would contribute sufficiently in the entire group (sufficient contributions violator; $M = 3.64$, $SD = 1.52$), $t(80) = 21.58$, $p < .001$.

In addition, a repeated measures ANOVA with entire group and violator-only group as within-person variables showed that group members expected more that the group would succeed in providing the public good in the entire group condition ($M = 4.21$, $SD = 1.53$) than in the violator-only condition ($M = 3.72$, $SD = 1.57$), $F(1, 80) = 10.11$, $p < .005$.

Trust

A repeated measures ANOVA also showed that after equality was violated, participants trusted the violator of equality significantly less (trust violator; $M = 2.57$, $SD = 1.23$) than the other group members in the entire group (trust others; $M = 5.26$, $SD = 1.12$), $F(1, 80) = 192.14$, $p < .001$. In the violator-only group, group members also displayed low levels of trust in the violator (trust violator-only group; $M = 3.17$, $SD = 1.49$), although this was somewhat higher than trust in the violator in the entire group (trust violator), $F(1, 80) = 19.22$, $p < .001$.

Contributions

In the initial contribution session, the majority of the participants adhered to the equality rule (82.7%, $M = 256.48$, $SD = 53.00$). In the entire group condition, again the majority contributed an equal share (65.4%, $M = 249.69$, $SD = 79.60$). In the violator-only condition, only

49.4% of the participants adhered to equality ($M = 210.94$, $SD = 132.25$). See Table 1 for the distribution of contribution behavior in the different conditions.

To check whether contributions in the initial contribution session differed for the entire group condition, a repeated measure ANOVA was carried out. This analysis revealed that the first and second contribution session were not significantly different, $F(1, 80) = 0.62$, $p < .44$, suggesting that in the entire group condition participants showed behavioral tolerance.

Interestingly, a repeated measure ANOVA on contributions in the entire group condition ($M = 249.69$, $SD = 79.60$) versus the violator-only condition ($M = 210.94$, $SD = 132.25$) revealed a significant difference between contributions, $F(1, 80) = 9.55$, $p < .005$.

Further, contributions in the second session (contribution entire group) were not significantly different from an equal share, $t(80) = -0.035$, $p < .98$. However, in the third contribution session, that is the violator-only group, there was a clear deviation from the equality rule, $t(80) = -2.66$, $p < .01$.

These findings thus speak against a 'second chance explanation'. They are, however, in line with the notion that people show behavioral tolerance toward a single violator in a group setting because they do not seem to be willing to hurt the others in their group.

Additional analyses

The present results seem to suggest that in the entire group condition participants were behaviorally tolerant of the equality violation because they did not want to hurt the interests of the other group members. Further, participants did not trust the violator, and particularly when facing the violator alone in the violator-only condition participants lowered their contributions. This observation suggests that participants did not expect that in the violator-only condition the public good would be provided. They were, however, more optimistic about the chances of success in the entire group condition, which accords with the idea that they do expect the other group members to contribute. This raises the question of whether trust and/or chances of success might serve as independent mediators of the effects we observed.

To test the role of trust and expectations on contributions, additional regression analyses were performed to test for mediation, following the guidelines of Baron and Kenny (1986). First, to see how trust in the violator predicted contribution behavior, regressing the difference between contributions in the violator-only condition and the entire group condition on group members' trusting the violator showed a significant effect, $\beta = .26$, $p < .05$. In addition, to see whether trust in the violator predicted

Table 1. Distribution of contributions in Experiment 1

Contribution	First contribution session	Entire group condition	Violator-only condition
0	1	3	16
1			1
10			1
25		1	1
100		1	2
125	1	1	
150		1	1
200	2	4	1
250	67	53	40
300	6	10	7
350		4	4
400	3	1	5
500	1	2	2
Total	81	81	81

expectations of sufficient contributions, regressing group members' expectation that the violator would contribute sufficiently in the violator-only condition on group members' trusting the violator also showed a significant effect, $\beta = .74$, $p < .001$. To see whether trust in the violator affected contribution behavior due to the expectation that contributions would be sufficient, a final regression analysis was conducted. Regressing the difference between contributions in the violator-only condition and the entire group condition on group members' expectations for the public good to be successful (mediator) and their trust in the violator (independent variable), revealed a significant effect for group members' expectations, $\beta = .42$, $p = .01$, whereas the effect for trust became nonsignificant, $\beta = -.05$, $p < .74$ (Sobel test = 2.56, $p = .01$). These analyses suggest that trust indeed influenced people's expectations and in turn influenced their decision behavior. Hence, this supports the explanation that group members were behaviorally tolerant of equality violations because they did not want to hurt the others because they still trusted the others more, and therefore still expected the group to be successful.

Discussion

Experiment 1 showed that group members deviated more from the equality rule when they were in a group with only the violator of equality than when they were in a group existing of the original group members (including the violator). This finding accords with the view that group members are behaviorally tolerant because they do not want to hurt the other group members by withholding contributions.

The pattern of results does not seem to support the idea that group members give the violator another chance. Yet one might raise the question whether people will ever give the violator a second chance. Building on the finding that differences in trust seem to underlie our results in Experiment 1, we suggest that individual differences in trust may moderate the extent to which contributions are reduced in the violator-only condition. This is what we investigated in Experiment 2, in which we also made some improvements. First, it may well be that the scenario situation in Experiment 1 was perceived as a less natural situation. In addition, in the scenario situation in Experiment 1, participants may also not have felt motivated to participate and invest in a course with the alleged violator. Therefore, in Experiment 2, no scenario setting was used but participants were placed in groups where they had to make actual contribution decisions. In addition, in Experiment 2, the group composition (the entire group and the violator-only group) manipulation was counterbalanced.

Experiment 2

Individual differences in trust have been shown to be important in social dilemmas as higher levels of trust increase levels of cooperation, and particularly so in public good dilemmas (De Cremer, Snyder, & Dewitte, 2001; Parks & Hulbert, 1995). A commonly accepted definition of trust is provided by Mayer, Davis, and Schoorman (1995) who argue that trust is:

> 'the willingness of a party to be vulnerable to the actions of another party based on the expectations that the other will perform a particular action important to the truster, irrespective of the ability to monitor or control that other party'. (p. 712)

This definition suggests that when trust is high, people will have confidence in another's goodwill, and will expect others to act in a moral and honest way (De Cremer et al., 2001; Ring & Van de Ven, 1994). For the current setting, this would suggest that people who are high in dispositional trust may be more inclined to frame violations of their expectations in a positive way and thus give the violator a second chance.

We suggest that the pattern we observed in Experiment 1 would be more characteristic for low trusters. Indeed, high trusters have been found to be more likely to give the transgressor a second chance (see e.g. Kramer, 1996; Stouten et al., 2006). Because of this (although similar to low trusters, they may have little trust in the violator), they may decide against withholding contributions in the subsequent social

dilemma situation. In contrast, those low in trust are not apt to give second chances and therefore will likely decide to withhold their contributions in the violator-only group, but not in the entire group. In the entire group, low trusters may distrust the violator but still adhere to the equality rule as this is the focal norm and they may not be willing to hurt the other group members. Thus, in the violator-only group, group members who have a high propensity to trust will be less likely to withhold contributions and deviate from equality relative to people who have a low propensity to trust. As in Experiment 1, we measured perceptions of trust and expectations of group success.

In sum, in Experiment 2, we expected an interaction between group composition (entire group vs. violator-only) and trust (low vs. high), such that the expected reduction in contributions in the violator-only condition would be more pronounced among group members low in trust. This would support an explanation of reluctance to hurt the other group members for *low trusters*, but support an explanation of giving the violator a second chance for *high trusters*.

Method

Participants and design

Participants were 100 undergraduate students who participated in exchange for course credit. Participants were welcomed to the laboratory and placed into separate cubicles containing a table, a chair, and a computer. All information was communicated via the computer, which was supposedly connected to a common server.

Assessment of trust First, participants answered a general trust questionnaire (Yamagishi & Yamagishi, 1994). This questionnaire contains six statements: (1) 'most people are basically honest'; (2) 'most people are trustworthy'; (3) 'most people are basically good and friendly'; (4) 'most people are trustful of others'; (5) 'I am trustful'; and (6) 'most people will respond in kind when they are trusted by others', measured on a 7-point scale (1 = not at all, 7 = very much so). These items were combined to form one average trust score (Cronbach's $\alpha = .75$). Using a median split (median = 4.83), 47 low trusters and 47 high trusters could be classified. Hence, six participants scored the median score and were excluded from analyses (see also, Parks, Henager, & Scamahorn, 1996; Parks & Hulbert, 1995; Stouten et al., 2006, for a similar procedure).

The introduction of the public good dilemma After that, participants learned that they, together with three other group members, formed a group, and that each group member would be referred to by means of a number between one and four (in reality all participants received the number two).

Further, participants learned that they were going to play several sessions of a social dilemma. Participants were told that each group member possessed a personal endowment of 20 chips (each chip = 5 Eurocents), which they, if they wished to, could contribute. If the group managed to reach a threshold of 40 chips, then the group would receive a bonus, which would be divided equally among the four group members. Hence, when the threshold of 40 chips would be reached, the group would earn a bonus of 80 chips (i.e. 20 chips each).

After explaining the situation, some comprehension questions were asked to check whether participants understood the situation. All participants answered these questions correctly.

Then, participants were asked how much they expected that each group member would contribute to the public good (expected contribution). Further, participants could decide which amount they wished to contribute to the public good (first contribution). After their decision, participants learned about the other members' contributions. First, it was said that the group had not contributed a sufficient number of chips in order to reach the threshold (this information was pre-programmed). Then, the exact number of chips that each group member had contributed was shown. Participants learned that two group members had contributed 10 chips (i.e. an equal share) and a third member had contributed two chips (i.e. violated the equality rule).

The entire group condition Then, participants were told that they were going to play another social dilemma with the same group members. This social dilemma had the same structure as the previous one, and participants again possessed the same personal endowment, which they could contribute to the public good. Before participants made their decision, they were asked whether they expected the group to succeed in contributing sufficiently (sufficient contributions entire group; measured on a 7-point scale: 1 = not at all, 7 = very much so). Participants finally were asked which amount of their personal endowment they wished to contribute to the public good (contribution entire group). Unlike the initial contribution session, participants did not receive feedback regarding the outcome of the public good situation.

The violator-only condition Subsequently, participants learned that another social dilemma would be played in which they were randomly coupled with another group member in order to form a group, which we refer to as the violator-only group. In reality, all participants, however, were put together in a group with only themselves and the violator. Participants were told that they possessed a personal endowment of 20 chips, and if the group surpassed a threshold of 20 chips, a bonus of 40 chips would be awarded to the group. In this social dilemma situation, only the threshold was different from the other situation, so that comparisons in contributions could easily be made between the social dilemma situations. After the situation was introduced, participants were cued for their understanding of the social dilemma situation. All participants answered these questions correctly.

Before participants made their decision, we assessed to what extent they expected the group would succeed to contribute sufficiently (sufficient contributions violator-only group), and whether they trusted the group member with which they were playing the social dilemma (i.e. trust in the violator) on a 7-point scale (1 = not at all, 7 = very much so). Then, they were given the opportunity to contribute to the public good using their personal endowment (contribution violator-only group).

This procedure was counterbalanced so that half of the participants first played with the entire group, and half of the participants first played with the violator-only group. Counterbalancing did not show any effects. Therefore, this variable was dropped from the analyses. Finally, participants were debriefed and thanked.

Results

Expectations

First of all, a one-way ANOVA of dispositional trust on the expected contribution behavior in the first contribution session showed no effect for dispositional trust, $F(1, 92) = 1.20$, $p < .28$ (low trusters: $M = 10.11$, $SD = 1.95$; high trusters: $M = 10.75$, $SD = 3.49$). Further, a large majority of participants expected that group members would adhere to the equality rule (81%) in the first contribution session.

After the first contribution session, a 2 (dispositional trust) × 2 (group composition) mixed-model ANOVA on the items of sufficient contributions in the entire group and sufficient contributions in the violator-only group with repeated measures on the latter factor showed an effect for group composition, $F(1, 92) = 48.44$, $p < .001$, and no effect for the interaction between dispositional trust and group composition, $F(1, 92) = 2.70$, $p < .11$. The effect for group composition showed that group members expected the entire group to be more successful ($M = 4.51$, $SD = 1.41$) than the violator-only group ($M = 3.56$, $SD = 1.56$) in providing the public good.

Furthermore, a one-way ANOVA of dispositional trust on the extent to which participants trusted the violator also revealed no effect for dispositional trust (low trusters: $M = 2.92$, $SD = 1.33$; high trusters: $M = 3.06$, $SD = 1.15$), $F(1, 92) = 0.34$, $p < .57$), showing that group members overall had little trust in the violator.

Contribution behavior

A 2 (dispositional trust) × 2 (group composition) mixed-model ANOVA on contribution behavior (first contribution and contribution entire group; see Table 2 for the distribution of contribution behavior in the different conditions) with repeated measures on the latter factor

Table 2. Distribution of contributions in Experiment 2

	First contribution session			Entire group condition			Violator-only condition		
Contribution	Low trust	High trust	Overall	Low trust	High trust	Overall	Low trust	High trust	Overall
0		1	1		1	1	4		4
1				1	1	3	1	1	2
2							4		4
3							1		1
5	3	1	5				2	4	7
8								3	3
9	1	1	2				1		1
10	39	30	73	44	36	83	33	34	71
11		1	1		3	3		1	1
12		2	2		2	2		1	1
13						1			
14		1	1					1	1
15	1	5	7	1	3	5	1	1	3
18					1	1		1	1
20	3	5	8	1		1			
Total	47	47	100	47	47	100	47	47	100

showed a main effect for group composition, $F(1, 92) = 4.98$, $p < .05$, but no significant interaction, $F(1, 92) = 1.97$, $p < .17$. The effect for group composition showed that contributions in the first session ($M = 10.93$, $SD = 3.43$) were somewhat higher than in the entire group condition ($M = 10.18$, $SD = 2.40$). Although there is a slight difference, means show that group members' contributions still were close to an equal share.

To see whether participants differed in their decisions when performing in the entire group and the violator-only group, a 2 (dispositional trust) × 2 (group composition) mixed-model ANOVA on contribution behavior (contribution entire group and violator-only group) with repeated measures on the latter factor showed a significant effect for group composition, $F(1, 92) = 11.66$, $p < .005$, and an interaction between dispositional trust and group composition, $F(1, 92) = 4.02$, $p < .05$ (Figure 1). This interaction showed that low trusters were more cooperative in the entire group session ($M = 10.13$, $SD = 2.11$) than in the violator-only group ($M = 8.00$, $SD = 3.83$), $F(1, 46) = 10.74$, $p < .005$. However, group composition did not affect contribution behavior of high trusters (entire group session: $M = 10.23$, $SD = 2.67$; violator-only group: $M = 9.68$, $SD = 2.55$), $F(1, 46) = 1.57$, $p < .22$.

In addition, a *t*-test showed that both low and high trusters adhered to the equality rule in the entire group, respectively $t(46) = 0.41$, $p < .69$, and $t(46) = 0.60$, $p < .56$. However, low trusters deviated from the equality rule in the violator-only group, $t(46) = -3.58$, $p < .005$, in contrast to high trusters who did not deviate from equality, $t(46) = -0.86$, $p < .40$.

Discussion

The results of Experiment 2 suggest that low trusters and high trusters may both be behaviorally tolerant in group settings, but possibly for different reasons. The pattern that we observed among low trusters resembled the pattern that we found in Experiment 1. They continued to adhere to equality in the entire group conditions, but in the violator-only condition, they lowered their contributions. This pattern accords with the notion that in group settings people may show behavioral tolerance toward a violator because they do not want to hurt the others. The pattern of high trusters was more in line with giving the

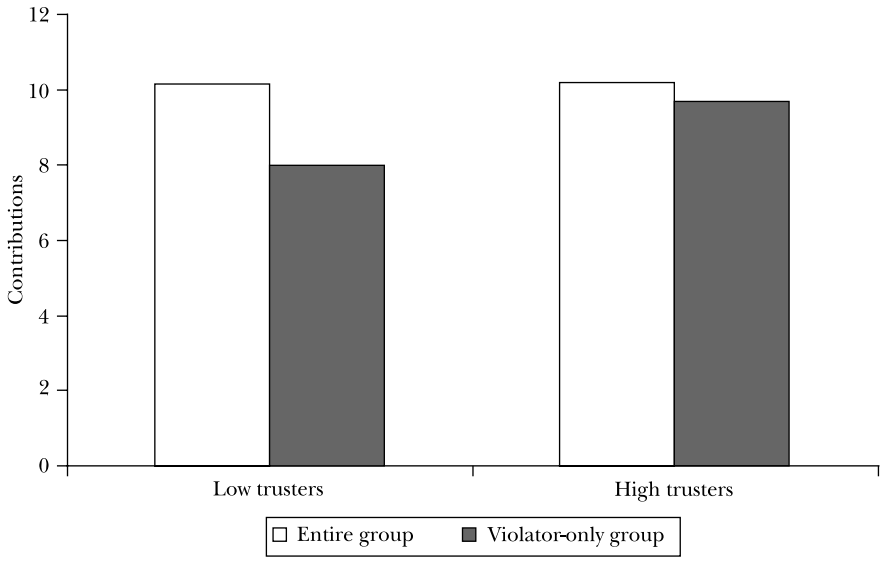


Figure 1. Contributions in the entire and violator-only group as a function of trust in Experiment 2.

violator another chance. They were prepared to contribute their equal share even when facing only the violator. Apart from these main findings, results also showed a small decline in contribution behavior in the first and second contribution. This finding agrees with research showing that contributions may decline over time in public good dilemmas (Ledyard, 1995). In addition, no main effect for trust on contribution behavior was found. This agrees with research that showed that personality is not predictive in situations that contain sufficiently clear cues for coordination (e.g. De Kwaadsteniet, Van Dijk, Wit, & De Cremer, 2006).

General discussion

In step-level public good dilemmas, individual decision-makers generally anchor their decision behavior on the equality rule, by contributing an equal share of the threshold. The equality rule is an especially important rule in such dilemmas because it is related to fairness and coordination on the threshold resulting in an efficient provision of the public good. Although people base their decision behavior on equality, it is likely that some people do not adhere to this rule. Previous research (see Stouten et al., 2005, 2006; Stouten, De Cremer, & Van Dijk, 2007) showed that if another group member violates the equality rule, group members are emotionally intolerant toward this action. This situation elicited negative emotional reactions in the other group members such as anger and irritation. However, research was still unclear about whether group members also would be behaviorally intolerant toward an equality violation. That is, would group members also consider withholding their contribution in subsequent group tasks?

In two experimental studies we investigated whether group members would be behaviorally tolerant (i.e. would continue to contribute) in a situation in which equality was violated. More precisely, we addressed whether group members would be behaviorally tolerant toward the violator because they were reluctant to hurt the other group members or because they wanted to give the violator another chance. To disentangle these explanations we addressed how people would decide on their contributions in an entire group (including the violator) and in a violator-only group. We reasoned that by only looking at contributions in the same

four-person group, it would be difficult to disentangle both explanations by looking at the decision behavior. That is, adherence to the equality rule in a situation with the same four group members would not reveal whether group members showed behavioral tolerance out of concerns not to hurt the others or because they wanted to give the violator another chance. By adding the violator-only group, we would be able to draw more definite conclusions. If group members adhered to equality when facing the entire group situation, but not when only facing the violator, this would signal that group members did not want to hurt the others. If group members gave the violator another chance, no differences should be found between the entire group and the violator-only group. In Experiment 1, we showed that when equality is violated, group members still adhere to an equality rule in the entire group situation, and hence show behavioral tolerance. This shows that although the group failed in providing the public good (because one group member violated equality), group members still seem to consider it important to focus on equality as a coordination rule. This finding is consistent with previous research showing that only considerable defection will push people over the tipping point of reducing their contributions (see e.g. Chen & Bachrach, 2003); although this prior research focused on the emergence of mere defection and not on the act of violating equality.

However, if they had to perform a second social dilemma task with only the violator, participants reduced their contributions. Moreover, in this situation, perceptions of trust affected expectations of cooperation, and people decided to withhold some of their contributions. Indeed, they showed less trust in the group in which only they and the violator were part of than in the entire group condition.

Experiment 2 showed that trust indeed played an important role when participants engaged in a social dilemma situation with only the violator. We demonstrated that depending on individual differences in trust (that is low vs. high trusters), group members either were behaviorally tolerant of equality violations because of concerns for the group (not wanting to hurt the others) or because they wanted to give the violator a second chance. More specifically, the pattern of results observed in Experiment 1 was primarily found among low trusters in Experiment 2. That is, low trusters were inclined to withhold contributions in the violator only group, whereas they adhered to equality in the entire group. This supports the idea that low trusters preferred not to hurt the other group members, rather than give the violator a second chance. In contrast, high trusters adhered to equality both in the entire and in the violator-only group, thereby showing that they tolerated the violator of equality suggesting that high trusters preferred to give the violator a second chance (cf. Stouten et al., 2006).

The present results are important, first of all, because they show the normative strength of coordination rules such as equality. People seem to have the expectation that others will contribute an equal share, and in doing so, they generally focus on an equality norm (Stouten et al., 2005). This tendency to focus on equality persists even if one other group member has violated this principle. Only when there is low trust, and hence, there are no positive expectations for the group to succeed (such as in the violator-only group in which one performs with only the alleged violator) do people reduce their contributions. Moreover, as is shown in Experiment 2, mainly low trusting group members' contributions significantly deviated from the equality rule in this situation. This finding also suggests that individuals differing in levels of trust may perceive such an equality violation differently and consequently take different decisions with regard to their contribution. Hence, our results show that the inclusion of people's individual differences with regard to violations of equality is important to understand how and why people can differ in their decision behavior (see e.g. Leventhal, Karuza, & Fry, 1980). The present research also adds to the literature on trust. Previous work showed that high trusters are less cooperative if the other person is competitive (Parks et al., 1996). However, the present findings show that this is less likely to be the case if the violator has

failed to contribute in a different setting (the four-person group) and group members now face the violator alone. In such a different situation, high trusters may reason that giving the other person a second chance is warranted.

An important strength of the present research is that, whereas previous research has demonstrated that people display emotional intolerance toward one group member violating equality (see Stouten et al., 2006), we showed that group members may sometimes show behavioral tolerance in a way that they may still trust the group (i.e. including the violator) as a whole and for this reason may keep contributing an equal share in order not to harm the interests of the others. Only when people have no cooperative expectations about the decisions of the other group members, do individuals reduce their contributions (which was the case in the violator-only group). An alternative explanation for these findings might be that participants reduced their contributions because of natural fall-off. Yet our results show that trust plays an important role in whether participants will deviate from equality or not in the violator-only condition. Thus, instead of an invariant decline in contributions, only those low in trust chose to do so. High trusters still contributed an equal share, thereby making it unlikely that participants reduced their contributions because of fall-off.

Future research is needed to further identify additional motives that may drive people to reduce their contributions. Several others factors may play a role that could not be clearly distinguished in the present research, such as people's commitment to the group, pressures of conformity, or people's concerns about their reputation towards the other group members. That is, people may be reluctant to deviate from equality because they feel committed to the entire group, want to conform to the group norm, or care for their own moral reputation. These additional reasons should be addressed in future research. In addition, although high trusters gave the violator a second chance, it is interesting to see why they decided to do so even though they had little trust in the violator overall. Maybe participants trust that in the long term giving the violator a second chance can enhance cooperation (see Van Lange, Ouwekerk, & Tazelaar, 2002).

For now, the main contribution of the present research lies in the fact that we examined the influence of trust in why group members may sometimes show behavioral tolerance toward the violation of equality by another group member. Such results complement prior research examining and demonstrating the impact of equality violations by one group member on negative emotions and retaliating behaviors of the other group members (see Stouten et al., 2005, 2006). In view of this emergence of behavioral tolerance, we think that another issue to consider is what would happen if one violates equality more than once. It may well be that people may be more motivated to withhold contributions in the case of a multiple offender, even in a situation where all group members are present.

The present findings can be seen as extending previous research on the equality rule in social dilemmas in several ways. Earlier studies on the use of equality examined whether people use the equality rule, and under which circumstances they may deviate from it (Allison, McQueen, & Shaerfl, 1992; Allison & Messick, 1990; Samuelson & Allison, 1994). This rule is used because it is simple and easy to apply in symmetric social dilemma situations. In support of this simplicity interpretation, research has shown that when, for example, goods are indivisible (i.e. individual shares are not easy to calculate), and the allocation situation thus becomes more difficult, people are motivated to take more than an equal share (Allison et al., 1992). The present research presents a new contribution to this literature by focusing on when group members may still adhere to equality even if this would not be expected. More specifically, we showed that when equality is clearly the focal rule, group members remain behaviorally tolerant of defection and do not promptly deviate from this rule.

In conclusion, the equality rule is a strong focal point in social dilemmas, even in the face of group failure. However, depending on

people's trust, group members may no longer be tolerant of equality violations. In the violator-only group, low trusting group members become less tolerant and decide to reduce their contributions and deviate from equality. Low trusters did not wish to hurt the entire group, but only the violator. In contrast, high trusters seem to portray a high level of tolerance for the violator and generally are inclined to give this person a second chance.

Note

1. The present scenario was a simplified version of some Master after Master classes that are only offered at the university if sufficient students have registered for the course. These classes often are expensive and the university guarantees that once it is sure that sufficient students are enrolled, additional funds will be made available to have the class started.

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