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BRIEF REPORT

Behavioural consequences of regret and disappointment in social bargaining games

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Previous research on the role of negative emotions in social bargaining games has focused primarily on social emotions such as anger and guilt. In this article, we provide a test for behavioural differences between two prototypical decision-related negative emotions—regret and disappointment—in one-shot social dilemma games. Three experiments with two different emotion-induction procedures (autobiographical recall and imagined scenarios) and two different games (the ultimatum game and the 10-coin give-some game) revealed that regret increased prosocial behaviour, whereas disappointment decreased prosocial behaviour. These results extend previous findings concerning differences between regret and disappointment to interdependent (social) situations.

Keywords: Regret; Disappointment; Prosocial behaviour; Social dilemmas.

Regret and disappointment qualify as the prototypical decision-related emotions, because they are very much tied to the decision process and its outcomes. Their impact on individual decision making has been studied extensively (see Martinez, Zeelenberg, & Rijsman, 2008; Zeelenberg, Van Dijk, Manstead, & Van der Pligt, 2000, for reviews). Interestingly, however, the impact of these emotions on choices in interdependent situations has hardly received any research attention. This neglect of studying the effects of these

decision-related emotions in social settings is considerable, since many real-life decisions affect and can be affected by others. In this article we aim to fill this gap and empirically examine how regret and disappointment may exert an influence on decision making in social dilemmas (i.e., interaction situations in which one person's individual interests are in conflict with the interests of another person).

Emotions have important social functions and consequences (Van Kleef, 2009). They are inherent

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to negotiation and social conflict (Davidson & Greenhalgh, 1999) and they motivate goal-directed behaviour (Frijda, 1986, Zeelenberg, Nelissen, Breugelmans, & Pieters, 2008). Unfortunately, although emotional states are crucial to understanding how individuals behave within bargaining situations (Barry, 1999), empirical research on the role of emotions on social decision making still discloses some limitations. So far, there is a plethora of evidence mainly centred on the “valence” aspect of emotions (i.e., their positive or negative dimension) and its influence on subsequent decision making. This approach does not account for behavioural differences between specific emotions that share the same valence. In other words, previous research has clearly documented that emotions influence behavioural decisions, but it remained relatively mute as to the effects of several specific emotions. Moreover, further specific research on negative emotions and social bargaining games has focused primarily on social emotions such as anger (e.g., Pillutla & Murnighan, 1996; Van Kleef, De Dreu, & Manstead, 2004), guilt (e.g., De Hooge, Zeelenberg, & Breugelmans, 2007; Ketelaar & Au, 2003), and shame (De Hooge, Breugelmans, & Zeelenberg, 2008). In this article, we present three experiments to investigate whether two negative emotions—regret and disappointment—lead to different behaviours in social decision-making situations. Let us first discuss some distinctive aspects of both emotions.

Regret and disappointment are emotional states that occur in response to negative decision outcomes. They are negative emotions that often result when our current state of affairs is worse than initially expected. As such, they have much in common: both emotions are related to risky decision making and uncertain outcomes, and both involve comparisons between an obtained decision outcome (“what is”) and a foregone outcome (“what might have been”). However, they are clearly different emotions, with distinguishable consequences for decision making (Zeelenberg et al., 2000). There are at least two ways in which violated expectancies can give rise to negative emotions. First, if the chosen option ends up being worse than the rejected options (i.e., when “bad

decisions” are made) regret often arises. Second, if the chosen option results in an outcome that is worse than expected (i.e., when “disconfirmed expectancies” occur) disappointment may be experienced. In this paper, we present three experiments to investigate whether regret and disappointment lead to different behaviours in social decision-making situations.

Research on the experiential content of these emotions (Roseman, Wiest, & Swartz, 1994; Zeelenberg & Breugelmans, 2008; Zeelenberg et al., 2000) shows that regret involves feeling that one should have known better, thinking about the possibility that one made a mistake, feeling a tendency to kick oneself and to correct one’s mistake, and wanting to undo the event and to get a second chance. On the other hand, disappointment involves feeling powerless, accompanied by a tendency to do nothing and get away from the situation. Hence, although they share the same (negative) valence, regret and disappointment serve distinct motivational functions that are rooted in the experiential qualities of these emotions.

Additionally, the ways that regret and disappointment influence decisions and behaviour has been the subject of a growing number of empirical research studies. In a series of studies concerning consumers who were dissatisfied with the delivery of a service, it was found that experienced regret resulted in switching to another service provider, whereas experienced disappointment resulted in complaining to the service provider and talking to others about the bad experience (i.e., word of mouth), but not switching to another service provider (Zeelenberg & Pieters, 2004). Even after the effects of general dissatisfaction had been accounted for, regret and disappointment showed different behavioural effects. Thus, whereas regretful consumers realised that switching to an alternative service provider was a better option, disappointed consumers complained to the service provider and shared the experience with others. This evidence is consistent with the fact that regret and disappointment have different experiential contents. Moreover, regret usually leads to a reparative action (i.e., learn from mistakes), whereas disappointment typically leads to inertia

accompanied by the tendency to talk to other people (i.e., sharing the experience). Thus, regret is likely to promote goal persistence and disappointment may result in goal abandonment.

In order to further our understanding of the role of emotions in social decision making, we present data concerning the effects of regret and disappointment in social-dilemma situations. Regret is related to “self” agency—and uniquely tied to the making of decisions. When experiencing regret, people might try to overcome this feeling by being more generous to the opponent in an interdependent negotiation game. This proactive decision (i.e., tendency to “correct one’s mistake”) consequently makes them feel better and decreases the possibility of facing rejection in the game—which would lead to more regret. This link between regret and responsibility explains why regret increases prosocial behaviour. Moreover, recent empirical research (Van Kleef, De Dreu, & Manstead, 2006) has shown that regret—as an appeasement emotion (Baumeister, Stillwell, & Heatherton, 1994; Keltner & Buswell, 1997)—signals an outward focus and a concern for the other, producing a beneficial effect on the interpersonal relationship. Within a negotiation context, their study showed that participants who faced a regretful opponent made larger demands from them. Moreover, they perceived the opponent as being more interpersonally sensitive. Thus, regret motivates helping and compensation behaviours for others.

In what concerns disappointment, agency for negative outcomes is either undetermined, in the environment or in another agent (i.e., “other” agency). Although disappointment is highly relevant in interpersonal situations (Van Dijk & Zeelenberg, 2002) such as negotiation contexts, research on its behavioural consequences is more sparse. Disappointed people often undergo in a sensation of powerlessness, generalised distrust and also lower their expectations in order to prevent future disappointment (Zeelenberg et al., 2000). Therefore, this “withdrawal” reaction may lead to a reduction in prosocial behaviour. Van Kleef et al.’s (2006) research revealed that disappointment—as a supplication emotion (Clark, Pataki, & Carver, 1996)—signals an inward focus

and a preoccupation with the self, generating a damaging effect on the interpersonal relationship. In their study, negotiators conceded more to opponents who showed supplication emotions (than to those who exhibited appeasement emotions). Thus, disappointment generates helping and compensation behaviours for self.

According to the line of reasoning above, we hypothesised that regret and disappointment would provoke different behavioural reactions in individuals that faced interdependent decision situations. Regret experiences would lead to “reparative” action that would result in a more generous behaviour. Disappointment experiences would lead to “self-reward” action that would result in a less generous behaviour. Thus, we predicted that prosocial behaviour (the size of the offers to others) would increase after regret was induced, but decrease after disappointment was induced.

The general approach of our three experiments consisted of first an emotion induction and next an assessment of prosocial behaviour in a social-dilemma situation. In order to generalise and extend our findings to multiple contexts, we used two different types of emotion induction and two different dilemma games, which are described below.

The first game used was the “giving” version of the ultimatum game (Leliveld, Van Dijk, & Van Beest, 2008; Nelissen, Leliveld, Van Dijk, & Zeelenberg, in press) framed within a negotiation context. It is a social bargaining game with two players in which the task is to divide a certain amount of money. In this version, the first player (the proposer) is the “property” owner and offers part of the money to the second player (the responder)—as opposed to the traditional (splitting) ultimatum game, in which players have to divide a joint endowment. If the offer is accepted by the responder, the sum of money is divided in the manner proposed by the first player. Should the offer be refused, no money is distributed (i.e., both players get nothing).

The second game used was a modified 10-coin give-some game (Van Lange & Kuhlman, 1994). Participants receive ten coins, each worth €1 for the participant but €2 for the interaction partner. The

interaction partner also has ten coins, each worth €1 for themselves but €2 for the participant. The participant decides how many coins to give to the interaction partner, without knowing how many coins the interaction partner will give. Participants would earn most when keeping all their coins to themselves (the most selfish option). In contrast, participants would earn most together when both offer all coins to the interaction partner (the most co-operative option). The number of coins offered to the partner is a measure of prosocial behaviour. This measure is often used in social-dilemma research (De Hooge et al., 2007; Ketelaar & Au, 2003; Nelissen, Dijk, & De Vries, 2007).

EXPERIMENT 1

Here we induced regret and disappointment with an autobiographical recall procedure and then measured prosocial behaviour in a giving-type ultimatum bargaining game.

Method

Undergraduate students (84 females and 36 males, $M_{\text{age}} = 22.58$, $SD = 3.55$) participated voluntarily in a series of experiments. First, participants were asked to write a detailed description of an event. They were randomly assigned to one of three conditions: write a detailed description of a recent experience when they felt regretful (Regret, $n = 40$), or disappointed (Disappointment, $n = 40$), or write a detailed description of a typical day (Neutral, $n = 40$). This emotion manipulation was adopted from Ketelaar and Au (2003; see also, De Hooge et al., 2007; Nelissen et al., 2007). Participants worked for approximately 15 minutes on the task. After the induction, participants indicated how intensely (1 = *not at all*; 9 = *extremely*) they felt several emotions, including regret and disappointment.

Next, participants played the “giving” version of the ultimatum game. By framing the situation in this way, we were looking for a more realistic approach to the game, so that participants would feel they were giving away part of their money,

instead of dividing a joint endowment, which in most cases would end up with a 50/50 split. The rules of the game were explained to them in the following manner:

You [the proposer] are about to make a deal that will yield you a small amount of money, in this case 21 euro. However, a colleague of yours [the responder] was the one who made the whole deal possible, so (s)he is waiting for a gratification. Thus, if your partner is not satisfied with your gratification (s)he will make the deal impracticable. First, you will decide on the gratification and tell it to your partner. Once you have made your offer, you cannot change it. Then, your partner will accept or reject your offer. If (s)he accepts it, the deal will succeed and both of you will divide the money according to your proposal. If (s)he rejects it, the deal will not succeed and both of you will get nothing.

Participants were told that half of them were randomly selected to be proposer and the other half to be responder, although in reality all of them were proposers. After reading the instructions, they were asked to divide 21 euro between themselves and the responder by filling in the blanks on a sheet of paper that stated: “I propose that ___ euro be given to me and that ___ euro be given to my partner”. Additionally, in order to prevent the likelihood of equalitarian divisions, an odd amount was used, and the possible proposals had to be in whole euro increments. The experiment ended when all participants made their offer.

Results and discussion

The results are presented in the upper part of Table 1. The emotion-induction procedure was effective. Regret levels were higher in the Regret condition and differed significantly from both other conditions, Disappointment: $t(78) = 12.57$, $p < .001$; Neutral: $t(78) = 13.38$, $p < .001$. Moreover, disappointment levels were higher in the Disappointment condition and differed significantly from both other two conditions, Regret: $t(78) = 10.94$, $p < .001$; Neutral: $t(78) = 16.56$, $p < .001$. There were no significant differences

Table 1. Average regret, disappointment and proposals/offers in the negotiation games as a function of the experimental conditions for all experiments

DV	Experimental condition			Test statistic
	Regret <i>M</i> (<i>SD</i>)	Disappointment <i>M</i> (<i>SD</i>)	Neutral <i>M</i> (<i>SD</i>)	
<i>Experiment 1</i>				<i>F</i> (2, 117)
Regretful	6.00 (1.70) ^a	2.13 (0.97) ^b	1.88 (0.97) ^b	135.50*
Disappointed	2.90 (1.26) ^a	6.20 (1.44) ^b	1.78 (0.89) ^c	143.11*
Proposals	7.15 (2.40) ^a	4.30 (1.77) ^b	5.15 (1.82) ^c	21.02*
<i>Experiment 2</i>				<i>F</i> (2, 153)
Regretful	7.35 (1.66) ^a	3.37 (1.87) ^b	1.83 (0.83) ^c	182.70*
Disappointed	5.27 (2.32) ^a	7.50 (1.71) ^b	1.69 (0.73) ^c	151.65*
Proposals	9.48 (2.74) ^a	6.65 (3.00) ^b	7.88 (2.88) ^c	12.63*
<i>Experiment 3</i>				<i>F</i> (2, 93)
Regretful	6.69 (1.60) ^a	3.47 (1.11) ^b	1.31 (0.64) ^c	167.86*
Disappointed	3.50 (1.46) ^a	6.97 (1.28) ^b	1.44 (0.72) ^c	175.04*
Offers	6.81 (2.19) ^a	4.16 (2.11) ^b	5.28 (2.07) ^c	12.61*

Note: Emotion level entries (Regretful and Disappointed) are mean scores on 9-point scales. Proposal entries are mean scores on a 0–21 scale. Offer entries are mean scores ranging from 0 to 10 coins. Higher scores indicate more intense emotions and more prosocial behaviour (higher proposals and higher offers). Means per row with different superscripts differ significantly (all t s > 2.12, all p s < .05). * p < .01.

between the emotion conditions on the other assessed emotions.

As expected, proposals were significantly affected by our manipulations. They yielded the highest values in the Regret condition, lower values in the Neutral condition and the lowest values in the Disappointment condition. Proposers who wrote essays on Regret were inclined to make higher offers in the negotiation game whereas Disappointment inductees made lower offers, $t(78) = 6.04$, $p < .001$. Moreover, offers in the Regret condition were significantly higher than offers in the Neutral condition, $t(78) = 4.20$, $p < .001$. Finally, when comparing the Disappointment and Neutral conditions, the proposals were significantly lower in the former condition, $t(78) = -2.12$, $p < .05$, although that effect was less pronounced, probably because the social withdrawal effects of the former emotion (leaving, hiding, or do nothing—the feeling of learned helplessness: “there is nothing you can do about it”) were not powerful enough to lower offers even more.

In sum, we found that regret and disappointment lead to different behaviours in a contextualised giving-type ultimatum game. Regret gave rise to more generous offers and disappointment to less generous offers, although this latter effect was less prominent. In the following experiments we sought to replicate and extend these results using other types of emotion-induction procedures and other types of social dilemmas.

EXPERIMENT 2

In Experiment 2, we induced regret and disappointment via imagined scenarios. The measure of prosocial behaviour and predictions were identical to Experiment 1.

Method

Students of all degree levels (104 females and 52 males, $M_{\text{age}} = 24.63$, $SD = 4.80$) participated voluntarily in a series of experiments. They were randomly assigned to the Regret condition

($n = 52$), the Disappointment condition ($n = 52$), or the Neutral condition ($n = 52$). We opted for describing an academic experience to stay close to the everyday experiences of our participants. Participants read a scenario about a Statistics exam of major importance for obtaining their long-awaited university degree. The precise date of the examination was, indeed, scheduled since the beginning of the semester. In the Regret condition, participants read:

You have adopted a passive attitude towards the course. You have not attended most of the classes nor studied properly during the semester. In the days prior to the exam, you could not resist going out, engaging in a series of social events, so again you did not train nor revise fundamental subjects. As a result, you were poorly prepared for the examination. Although the assessment was quite easy, due to your lack of preparation you expect almost certainly to FAIL.

On the contrary, participants in the Disappointment condition read:

You have adopted a proactive attitude towards the course. You have attended most of the classes and studied hard during the semester. In the days prior to the exam, you were able to train and revise fundamental subjects. As a result, you felt properly prepared to the examination. However, you started to feel anxious when you realised the assessment was much harder than expected. Moreover, many questions were about subjects you dislike. To make things worse, you were disturbed by an unexpected diarrhoea, losing 15 precious minutes in the toilet. Thus, you expect almost certainly to FAIL.

In the Neutral condition, participants read that they had studied properly for the exam, nothing special happened, so it went normally and they will probably pass. After reading their scenario, participants indicated how intensely (1 = *not at all*; 9 = *extremely*) they would have felt several different emotions in that situation, including regret and disappointment. Next, they played the same ultimatum game as in Experiment 1.

Results and discussion

The results are presented in the middle part of Table 1. Again, the emotion-induction procedure was effective. Regret levels were higher in the Regret condition and differed significantly from both other conditions, Disappointment: $t(102) = 11.50$, $p < .001$; Neutral: $t(102) = 21.47$, $p < .001$. Moreover, disappointment levels were higher in the Disappointment condition and differed significantly from both other two conditions, Regret: $t(102) = 5.58$, $p < .001$; Neutral: $t(102) = 22.54$, $p < .001$. Guilt levels were also high in the Regret condition ($M = 6.15$, $SD = 2.24$) and differ significantly from the Control condition, $t(102) = 13.79$, $p < .001$. This is not unexpected, as feelings of regret and guilt tend to co-occur (Zeelenberg & Breugelmans, 2008). There were no significant differences between the emotion conditions on the other assessed emotions.

As expected, proposals were significantly affected by our manipulations. They yielded the highest values in the Regret condition, lower values in the Neutral condition and the lowest values in the Disappointment condition. As expected, Regret participants were inclined to make higher offers in the negotiation game whereas Disappointment inductees made lower offers, $t(102) = 5.02$, $p < .001$. Moreover, offers in the Regret condition were significantly higher than offers in the Neutral condition, $t(102) = 2.90$, $p < .01$. Finally, when comparing the Disappointment and Neutral conditions, the proposals were significantly lower in the former condition, $t(102) = -2.13$, $p < .05$. Again, these findings are consistent with the idea that regret and disappointment provoke different behavioural reactions in individuals that face an interdependent situation.

EXPERIMENT 3

Experiment 3 presents a replication using another dependent variable: the 10-coin give-some dilemma game (Van Lange & Kuhlman, 1994). We

again used the autobiographical recall procedure as emotion induction.

Method

Undergraduate students (61 females and 35 males, $M_{\text{age}} = 21.04$, $SD = 2.34$) participated voluntarily in a series of experiments. Participants were randomly assigned one of a Regret ($n = 32$), Disappointment ($n = 32$), or Neutral ($n = 32$) condition. The emotion-induction procedure was the same as in Experiment 1. Next, participants played the 10-coin give-some dilemma game. Participants were randomly seated in the room and told that they would play the game with the person sitting by their side. The rules of the game were explained to the participants in the following manner:

You are playing a game with the partner who is sitting next to you. In this game, both of you have ten special coins. Each of your coins is worth €1 for you, but their value doubles (€2) for your partner. The same applies to your interaction partner: (s)he also has ten special coins, each worth €1 for (her)himself and €2 for you. You have to decide simultaneously how many coins to give one another—without knowing the other person's decision. How many coins will you give to your interaction partner?

Results and discussion

The results are presented in the lower part of Table 1. Again, the emotion-induction procedure was effective. Regret levels were higher in the Regret condition and differed significantly from both other conditions, Disappointment: $t(62) = 9.40$, $p < .001$; Neutral: $t(62) = 17.67$, $p < .001$. Moreover, disappointment levels were higher in the Disappointment condition and differed significantly from both other two conditions, Regret: $t(62) = 10.10$, $p < .001$; Neutral: $t(62) = 21.31$, $p < .001$. There were no significant differences between the emotion conditions on the other assessed emotions.

As expected, offers were significantly affected by our manipulations. Again, they yielded the

highest values in the Regret condition, lower values in the Neutral condition and the lowest values in the Disappointment condition. As expected, Regret participants were inclined to make higher offers in the negotiation game whereas Disappointment inductees made lower offers, $t(62) = 4.94$, $p < .001$. Moreover, offers in the Regret condition were significantly higher than offers in the Neutral condition, $t(62) = 2.88$, $p < .01$. Finally, when comparing the Disappointment and Neutral conditions, the proposals were significantly lower in the former condition, $t(62) = -2.15$, $p < .05$. We thus replicated results of the previous experiments using another interdependent social-dilemma game. Again, regret led to a more generous behaviour than disappointment.

GENERAL DISCUSSION

We started our research with the question of whether regret and disappointment could be distinguished on the basis of how these emotions manifest themselves in social-dilemma situations. Our results clearly supported our predictions by showing that regret increases prosocial behaviour, whereas disappointment provokes the opposite effect. These facts are in line with previous research that reported differences between individual action tendencies and motivations involved in regret and disappointment (e.g., Zeelenberg et al., 2000).

In all three experiments, regret led to more generous offers whereas disappointment led to less generous offers in the social dilemma games, our dependent measure of prosocial behaviour. The situations used in our research typically involved interpersonal interaction and overcome a drawback of previous research, mainly focused at the individual level. Hence, our findings generalise the behavioural implications of regret and disappointment to interdependent situations. Below, we comment on the implications of our results as well as some of their limitations that call for future research.

First, we believe that our findings have important consequences for researchers incorporating regret and disappointment in their studies. Negative emotions may enclose positive influences on prosocial behaviour as previously found for shame (e.g., De Hooe et al., 2008) and guilt (e.g., Ketelaar & Au, 2003). Moreover, in line with the work of Van Kleef et al. (2006), we have found that experienced regret—as an appeasement emotion—has a beneficial effect on co-operation, increasing prosocial behaviour. Conversely, experienced disappointment—as a supplication emotion—has a detrimental effect on co-operation, reducing prosocial behaviour.

Second, although regret is a broader emotion than guilt, both emotions may promote similar behavioural reactions, as their phenomenology is shared in situations of interpersonal harm such as a social dilemma game (Baumeister et al., 1994; Berndsen, Van der Pligt, Doosje, & Manstead, 2004; Zeelenberg & Breugelmans, 2008). In our study, regret operates quite similarly to guilt: it recalls that one has hurt another person, thereby motivating a reparative behaviour in order to undo the wrongdoing (Gilovich & Medvec, 1995; Tangney, Miller, Flicker, & Barlow, 1996). On the contrary, disappointment elicits preoccupation with self, engaging in a conduct of self compensation. Again, this is in line with the findings reported by Van Kleef et al. (2006), which perceived regret as an appeasement emotion and disappointment as a supplication emotion.

Third, in what concerns behavioural consequences of regret in social-dilemma situations, we extended previous findings of Zeelenberg and Beattie (1997). Interestingly, in their study regret decreased prosocial behaviour. Our study differs from theirs in relevant aspects: it did not involve feedback structures nor the knowledge of minimal acceptable offers in the dilemma games. More importantly, their study dealt with the effects of integral (or “endogenous”) anticipated regret about hypothetical offers on subsequent behaviour in the classic ultimatum game, whereas our study entailed an incidental (or “exogenous”) emotion-induction procedure followed by the social interaction.

Concerning the potential methodological weaknesses of the study, we consider the use of two emotion-induction procedures to be a weakness but, at the same time, a strength. A weakness because it may hinder the comparison of the results given by distinct emotion-induction methods but, more importantly, a strength, because the use of different methods definitely increases the validity of the main conclusions.

In closing, let us return to the core subject of our current research and depict its implications at a higher level. We searched for (and found) behavioural differences between two closely related emotions—regret and disappointment—in social interdependent situations. In line with previous research, and by taking the motivational aspect of emotion seriously, our findings report distinctive behavioural consequences between two negative emotions, thus categorising the valence-based approach as inadequate and counterproductive in order to understand and predict behaviour.

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