



The relativity of bad decisions: Social comparison as a means to alleviate regret

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In two studies, we examined the role of social comparisons in regret management. In the first study, participants received a (relatively) negative outcome after which they were presented with base-rate information about the performance of other participants in the experiment. Results showed that experienced regret decreased as a result of base-rate information showing that most others made even worse decisions than oneself. In the second study, we investigated whether people actively seek this kind of consensual information to validate their decision. After inducing regret by means of a manipulated outcome in a trivia quiz, participants could obtain information about the outcomes of previous participants or about the type of items used in the quiz. Participants' preference was determined by whether or not they believed that they would be given a second chance. In case of a negative and final outcome, participants preferred information about the prevalence of others who had an even worse outcome. When the outcome was non-final, participants preferred information about the type of items used in the test. Both strategies were accompanied with a decrease in regret. Implications for research on regret and decision making are discussed.

'Comparison, more than reality, makes men happy or wretched'

Thomas Fuller (1732).

Whereas the antecedents of regret have been widely investigated (e.g. Gilovich & Medvec, 1994; Gilovich, Medvec, & Kahneman, 1998), its cognitive and behavioural consequences have received modest attention. Given that people are generally regret averse (e.g. Abraham & Sheeran, 2003; Zeelenberg, Beattie, van der Pligt, & De Vries, 1996), one would expect that once people do experience regret they take action to minimize this unpleasant feeling. Zeelenberg and Beattie (1997) examined decision making subsequent to a regretful decision. They found that participants adjusted their behaviour after they experienced regret (see also Zeelenberg & Pieters, 1999).

Gilovich and Medvec (1995) term these consequences; 'behavioural repair work', i.e. actions aimed at undoing the regrettable action (see also Zeelenberg & Beattie's (1997)

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regret management). Gilovich and Medvec (1995) also refer to 'psychological repair work' that involves psychological strategies aimed at reducing experienced regret. Such strategies include identifying a cloud's 'silver lining': by focusing on the profitable aspects of the regrettable experience - 'But I learned so much, it helped me to fulfil my personal growth' - less attention is given to the detrimental consequences, which helps to reduce the experienced pain. Another form of psychological repair work discussed by Gilovich and Medvec (1995) is 'dissonance reduction' by reevaluating the outcome. For example, if one chooses a cheap holiday with uncertain weather conditions in favour of a more expensive holiday to a destination where the sun always shines, one can experience regret if rain is pouring down on arrival. One way to reduce felt regret is to convince oneself that sunshine was never going to be the most important aspect of this holiday anyway.

The different forms of psychological repair work distinguished by Gilovich and Medvec (1995) pay limited attention to the *social* realm as a means to cope with feelings of regret, even though satisfaction often depends on the comparison with others. Research on social comparison dates back to the seminal work of Festinger (1954) who argued that people have a drive to evaluate opinions and abilities through comparisons with others. A number of studies have shown that feelings of regret can relate to social comparisons (e.g. Connolly, Ordonez, & Coughlan, 1997; Kumar, 2004; Larrick, 1993; Tycocinski & Pittman, 1998). However, none of these studies specifically addressed social comparison as a means of managing feelings of regret.

Social comparison and regret

Social comparisons can take different shapes and forms. One can compare one's outcome with a specific other individual or one can examine 'base-rate' information about the prevalence of outcomes of a larger sample of others. Bar-Hillel (1980) has argued that base-rate information is used when forming a judgment, when it is sufficiently specific and relevant. Other research has shown that base-rate information can even be considered *more* reliable than information about one specific individual (e.g. Kahneman, Slovic, & Tversky, 1982; Krosnick & Sedikides, 1990), especially in unfamiliar situations.

When experiencing a negative emotion such as regret, the need to compare one's situation with a larger sample of others may be particularly salient. People frequently use knowledge about behaviour of others as information that can validate the accuracy of their own judgments (i.e. Asch, 1956). Research has shown that social consensus estimates can be guided by ego-defensive motivations (e.g. Mullen & Goethals, 1990; Mullen & Hu, 1988). The present research aims to show that consensus information can also serve more specific goals, i.e. managing negative emotions such as regret.

To summarize, regret reflects how an individual feels about a previous decision. When an individual is uncertain about the quality of a decision, information about how *others* have decided may influence the perception of how normal one's decision was, which, in-turn, may influence how the decision is evaluated. This relates to norm theory by Kahneman and Miller (1986) and the work by Zeelenberg, Van Dijk, Van den Bos, and Pieters (2002). Thus, dependent on how favourable or unfavourable the comparison is, base-rate information can attenuate or amplify experienced regret. This is what we investigate in the present studies.

Regret management

In the current studies, we focus on how people *repair* feelings of regret. To examine this, we *manipulated* levels of experienced regret rather than simply asking participants to

imagine a particular outcome. To do this, we developed a task with real outcomes. We assessed participants' feelings of regret twice; first after having obtained their outcome, second after having had the opportunity to engage in regret management strategies. In the first study, we induced regret and subsequently presented participants with information about how their outcome related to those of others (favourable or unfavourable base-rate information). The second study assessed when people are particularly inclined to use favourable base-rate information in order to minimize regret.

STUDY I

In this first study, we manipulated levels of regret by having participants gamble with real money. After finding out that the outcome was negative (money was lost or more money could have been won), participants were presented with information about previous participants' superior or inferior performance on the same task in order to assess how the valence of this information influenced regret. We also measured disappointment (which is a closely related response but does not require a sense of personal responsibility, e.g. van Dijk, Zeelenberg, & van der Pligt, 1999) in order to assess whether any obtained effects were specific to regret.

Method

Participants

Eighty-two first-year psychology students at the University of Amsterdam participated in this study for either course credit or a financial reward of 7 euros. The sample consisted of 27 males and 55 females with ages ranging from 17 to 37 years. Participants were randomly assigned to either the favourable or the unfavourable base-rate condition.

Procedure and variables

On arrival, participants were seated at a computer that guided them through the experiment. Participants were told that they had the opportunity to earn some (additional) money in this experiment by playing a trivia quiz and wagering on the outcome. They were also shown a sample question: 'Who developed the modern laws of gravity, Newton or Einstein?' The experimenter explained that 6 euros were available for making wagers and that answering 7 out of the 10 questions correctly would double this wager, whereas answering fewer than 7 questions correctly would result in the wager being lost. Participants were offered the choice between a safe wager of 2 euros (keeping 4 euros 'safe') and a risky wager of 4 euros (keeping 2 euros safe).

Participants were told that everyone would receive the same trivia quiz. However, in fact, two different versions were used, one easy and one difficult (according to pre-testing). The easy quiz contained questions such as 'Which rock is harder, sapphire or diamond?', whereas the difficult quiz contained questions such as 'Is a Tahltan a cat or a dog?' Participants selecting the safe choice (2 euros) received the easy quiz. Those who made the risky choice (4 euros) received the difficult quiz. The outcome was manipulated so that nobody passed the difficult quiz or failed the easy quiz. We predicted therefore that all participants would regret their choice. The procedure is summarized in Table 1. After the test, we asked participants how certain they felt that they had passed their test on a 7-point scale ranging from *very uncertain* to *very certain*.

After this regret manipulation, we measured feelings of regret with 'I feel regret about my choice of wager', using a 7-point scale ranging from *totally not agree* (1) to *totally agree*

Table 1. Summary of procedure, Study 1

Bet	Test	Feedback	Outcome	Counterfactual
Safe (wager 2 euros)	Easy	Pass	8 euros	10 euros
Risky (wager 4 euros)	Difficult	Fail	2 euros	4 euros

(7). Subsequently, we measured disappointment with ‘I feel disappointment about my choice of wager’, using a 7-point scale ranging from *totally not agree* (1) to *totally agree* (7). Finally, we measured behavioural intention. We asked participants what amount of the 6 euros they would wager if they would have the same amount of money as at the beginning of the experiment and could gamble again. Participants could choose 0, 1, 2, 3, 4, 5, or 6 euros. This measure enabled us to examine if regret changes one’s behavioural intention.

After the initial regret measure, participants were presented with bogus base-rate information that allowed them to compare their earnings to those of a larger sample of similar others (and thus validate their emotional response). We told them that the study was part of a larger research programme that had been going on for quite some time and that the portion of the 6 euros that participants were able to wager varied in previous studies. We presented them with a distribution of earnings obtained by fellow students in earlier sessions of the experiment. In the favourable base-rate condition, the distribution of earnings was such that their outcome was relatively good, whereas in the unfavourable base-rate condition their outcome was relatively bad, when compared with those of the larger sample. The distribution in the favourable condition is presented in Figure 1. Next, we again measured regret, disappointment, and intention using the same measures as described above. Subsequently, participants were thanked and debriefed.

Results

Manipulations

Of the 82 participants, 44 wagered 2 euros, while 38 chose to wager 4 euros. Initial levels of regret did not differ significantly between participants making a safe choice ($M = 2.89$, $SD = 1.66$) and those making a risky choice ($M = 2.39$, $SD = 1.57$; $t(80) = 1.37$, *ns*). We also found no differences between the two groups in terms of their disappointment ($M = 2.95$, $SD = 1.74$ vs. $M = 2.71$, $SD = 1.63$; $t(80) = 0.65$, *ns*).

Moreover, participants taking the easy test were significantly more certain that they had passed ($M = 4.32$, $SD = 1.61$) than participants taking the difficult test ($M = 2.84$,

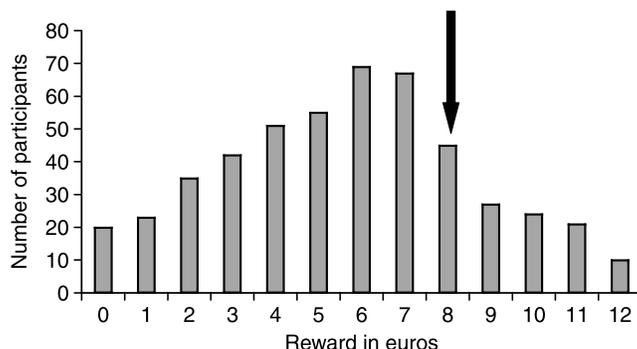


Figure 1. Distribution of previous earnings in the favourable base-rate condition.

$SD = 1.20$; $t(81) = 4.65$, $p < .001$). Interestingly, there was a significant correlation between certainty and initial levels of regret. The more certain participants were about passing the test, the more regret they experienced afterwards ($r = .24$, $p = .03$). More specific analysis showed that this effect is caused by the participants making a safe choice ($r = .33$, $p = .03$). The correlation was non-significant for participants making a risky choice.

Base-rate information and regret

To examine the effects of base-rate information on regret, we performed a mixed design ANOVA with experimental condition (favourable ($N = 42$) or unfavourable base-rate information ($N = 40$)) and wager (risky or safe) as between-participants variables and time (T1 vs. T2) as a within-participants variable. There were no significant main effects or interactions involving the wager variable. However, there was a significant interaction between condition and time ($F(3, 78) = 4.82$, $p = .03$). In the condition where respondents were presented with favourable base-rate information, there was a significant decrease in regret over time ($M = 2.71$, $SD = 1.63$ vs. $M = 2.43$, $SD = 1.43$; $t(41) = 2.50$, $p = .02$). In the case of unfavourable base-rate information, there was no significant difference in regret between T1 and T2 ($M = 2.60$, $SD = 1.65$ vs. $M = 2.87$, $SD = 1.67$; $t(41) = 1.26$, $p = ns$). No comparable effect was obtained on the disappointment measure.

Intention

We also asked participants how much of the 6 euros they would like to wager if they could gamble again with the money they started off with. We measured how much their intention shifted towards the option they did not choose (the counterfactual). This index gave high scores both to participants who gambled and lost and intended to wager less next time, and to participants who did not gamble and won and intended to wager more on a subsequent occasion. Scores on this index ranged from -2 to 4 ($M = 0.69$, $SD = 1.58$) and were not affected by favourability of base-rate information. We did however find a significant correlation between initial levels of regret and intention ($r = .42$, $p < .001$), indicating that the more regret participants experienced, the more they intended to choose the other option on the next occasion.¹ Not surprisingly, we also found a significant correlation between intention and regret at T2 ($r = .59$, $p < .001$). Both correlations are significant regardless of wager and experimental condition.

One could argue that the effect of base-rate information on subsequent regret was simply due to upward or downward counterfactual thinking and/or upward or downward social comparisons. We expected comparative information about a larger sample of relevant others to be more informative than a single counterfactual. To rule out this alternative explanation, we replicated the present study with different information provided about alternative outcomes. In a first condition, we provided 54 participants with *individual* information about a fellow student who either made an even worse decision or a better decision, along the same lines as in the present study.

¹ It might be argued that favourable base-rate information has an effect on a more general level, i.e. by simply improving people's mood. In-turn, this might dampen the experience of negative emotions such as regret. However, in this study, we also measured feelings of disappointment. This allowed us to examine whether the effects are specific to regret. Results supported this conclusion: we did find the expected significant correlation between regret and disappointment, but found no significant effect of base-rate information on the reduction of disappointment. And although the correlation between disappointment and behavioural intention was significant, it was significantly smaller than the correlation between regret and intention.

Results showed no effect of this individual social comparison information on subsequent levels of regret. In the downward condition, the difference was in the opposite direction (.19) and non-significant ($t(31) = 1.23, ns$). In the upward condition, the difference was in the predicted direction (.14) and non-significant ($t(31) = 0.59, ns$). Finally, a further 50 participants were asked simply to imagine a counterfactual outcome. Again, this did not affect the experienced levels of regret. Apparently, base-rate information is more informative than merely showing participants what might have been.

Discussion

The results of this study were consistent with our prediction that base-rate information showing that others have done worse can attenuate feelings of regret. The effect of *unfavourable* base-rate information on regret however was non-significant. This is in accordance with Krosnick and Sedikides (1990) who argued that people are especially likely to use base-rate information if it is *self-serving*. These findings are also in line with earlier work on social comparison which has also shown that downward social comparisons can help to cope with threat (e.g. Wills, 1981). The current study extends these findings by showing that social comparisons also have an effect on specific emotions, in this case regret.

With respect to the implications of regret for future behaviour, our results show that participants who regret wagering a large part of the 6 euros intended to wager less money on a subsequent occasion. Participants who regret wagering a small amount intended to wager more next time, perhaps to avoid experiencing regret on a subsequent occasion. The finding that participants' regret influences subsequent behaviour is consistent with previous work by Zeelenberg and Beattie (1997).

The fact that less regret was reported after receiving favourable base-rate information in this study raises the possibility that people may actively seek out this kind of information in order to regulate their emotion under certain circumstances. One factor that might determine whether people choose this strategy might be the *irreversibility* of the experienced outcome. Research by Markman, Gavanski, Sherman, and McMullen (1993) has shown that counterfactual thinking depends on whether future outcomes are susceptible to improvement. While prior research by Medvec and colleagues (Medvec, Madey, & Gilovich, 1995; Medvec & Savitsky, 1997) indicated that *just* missing out on a positive outcome makes one feel worse than not even getting close to obtaining this outcome, Markman and colleagues (1993) showed that this phenomenon depends on outcome reversibility. This is because reversible outcomes shift people's focus from what *could* have happened in the past to what *can* happen in the future.

On the basis of these results, we argue that favourable base-rate information will reduce regret most in situations where people feel there will be no second chance. If people think there *will* be an opportunity to obtain a better outcome on a subsequent occasion, they will be more likely to seek information that could help them to obtain a better outcome next time. These predictions were tested in Study 2.

STUDY 2

Study 2 had three aims. First, we wanted to examine *if* participants actively try to acquire (favourable) base-rate information following a regretted outcome. Second, we examined if participants are more inclined to obtain base-rate information following a final rather than a repeatable or reversible outcome. Participants who feel that they have

a chance to do better on a subsequent occasion are expected to be more interested in information that might help them improve their future performance (i.e. item difficulty, quiz topics, etc). Third, in each of the conditions, we examined whether choice of information is associated with reduced regret.

Although Study 1 found effects of favourable base-rate information on regret and not on disappointment, this does not rule out an effect of their overall affective response to quiz performance. In Study 2, we therefore included measures of general positive and negative affects to assess this possibility. A final difference is that Study 2 manipulated regret in response to unequivocally negative outcomes rather than the relatively less positive outcomes used in Study 1.

Method

Participants and design

One hundred and fourteen psychology students (44 males and 70 females) at the University of Amsterdam participated in this study for either course credit or a financial reward of 7 euros were randomly assigned to the final outcome condition or the non-final outcome condition.

Procedure and variables

Experimental sessions were run in groups of 6–10 participants. On arrival, participants were seated at a computer that guided them through the experiment. Participants were told that the experiment was about cognitive strain and memory and that they would be asked to perform a rather exhausting memory task. Participants were told that the duration of the memory task would vary. Some would have to do the task for 20 minutes, while some would have to do it for 10 minutes, and others would not have to do it at all. The duration of the task was determined by their performance on the same general knowledge test used in Study 1. Participants could choose whether or not they wanted their performance on this general knowledge test to determine the time they would have to spend on the memory task. If they did not want their score on the knowledge test to play a role, they would be required to do the memory task for 10 minutes (safe choice). However, if they chose to 'gamble', they could avoid performing the memory task at all if they managed to answer seven or more questions correctly, but would have to do the task for 20 minutes if they failed (risky choice).

After making their decision, participants were presented with the quiz. As in Study 1, those who selected the *safe option* were presented with the easy test and received feedback indicating that they had answered more than seven questions correctly and therefore would not have had to do the strenuous memory task, had they chosen differently. Participants who selected the *risky option* were randomly assigned to one of two conditions. Participants in the difficult test condition received unfavourable feedback, while those in the easy test condition received favourable feedback and constituted our control group. Before giving feedback, we again asked participants how certain they felt about passing the test on a 7-point scale from *very uncertain* to *very certain*.

Thus, we created two groups that had a reason to regret their choice, and one group with no reason for regret. The no-regret group, which was our control group, did not have to do the task and had no reason to feel regret. The fact that participants in this control condition could be seen leaving the laboratory upon receiving feedback should

have made the procedure more believable for participants in the regret condition as well as increasing their irritation at having to perform the memory task themselves.

Next, participants carried out the memory task. This task consisted of trials in which participants were presented with numbers consisting of eight digits for 10 seconds each. Their task was to memorize each number and reproduce it by entering it on the keyboard 5 seconds later. Trials were repeated for 10 or 20 minutes depending on experimental condition.

After the memory task, we measured participants' regret about their decision to gamble or not using the same items as Study 1, preceded by two items measuring general positive and negative affect. We asked the following question: 'How negative do you feel at this moment?' and 'How positive do you feel at this moment?' both measured on a 7-point scale ranging from *not at all* to *very*. This measure of general affect preceded the regret measure to avoid contamination of regret ratings with more general negative feelings (Van Dijk, van der Pligt, & Zeelenberg, 1999).

Next, the manipulation of outcome finality was implemented. Half the participants in the regret conditions were randomly assigned to the *non-final* condition and were told that they were going to play a similar game, again involving trivia questions but this time for a cash reward. The other half were not told of any subsequent task (final condition).

Next, participants were offered a choice between two types of information, both of which were described briefly before they made their choice. They could either select information that related their outcome favourably to that of a larger sample of others (the favourable base-rate information we used in Study 1), or general information about the type of items used in the test. It is important to note that with respect to the first option, participants knew that this information would show that many others were worse off than themselves. They however did not know exactly how and to what extent. The latter option presented them with information about the difficulty of the test and the percentage of questions related to different topics (e.g. 20% geography, 30% history, etc.) and information about the difficulty of the questions. Participants were subsequently asked how certain they were about their preference for this type of information on a scale from *very uncertain* (1) to *very certain* (7). After rating their certainty, they were presented with the information they selected. After reading the information we again measured regret, using the same measures as before. Finally, participants were thanked and debriefed.

Results

Manipulations

The distribution of participants across conditions is presented in Table 2. Twenty-nine of the participants in the regret condition chose to play and 40 chose not to play. There was no significant difference between these latter two groups on the initial regret measure ($M = 3.00$, $SD = 1.81$ for the gamblers, $M = 3.75$, $SD = 2.11$ for the non-gamblers). Nor were there differences between the two groups in terms of their overall positive feelings ($M = 4.55$, $SD = 1.33$ for gamblers and $M = 4.38$, $SD = 1.23$ for non-gamblers; $t(67) = 0.57$, *ns*). There was also no difference between these groups in terms of their negative feelings ($M = 3.14$, $SD = 1.58$ for gamblers and $M = 3.18$, $SD = 1.62$ for non-gamblers; $t(67) = 0.10$, *ns*). Participants were significantly more certain about passing the easy test ($M = 4.58$, $SD = 1.65$) than the difficult test ($M = 3.35$, $SD = 1.39$; $t(112) = 4.20$, $p < .001$).

Table 2. Distribution of participants across experimental conditions, Study 2

Condition	Non-final		Final	
	Gamble	No gamble	Gamble	No gamble
Regret	11	22	18	18
No regret	23	0	22	0

Note. Half of the participants who chose to gamble were provided with favourable feedback about their performance on the test. These participants constituted the no regret group. Thus, there are no participants who did *not* gamble in the no regret condition.

Planned contrasts confirmed that participants experienced more regret, more negative feelings, and less positive feelings in conditions where they had to do the memory test for 10 or 20 minutes than in the condition where they did not have to do the memory task at all, indicating that the manipulation was successful (see Table 3 for means).

Table 3. Levels of regret and overall affect by experimental condition, Study 2

Condition	Regret		Positive affect		Negative affect	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
No task	1.27	0.72	5.73	0.91	1.96	1.02
10-minute task	3.75	2.11	4.38	1.23	3.18	1.61
20-minute task	3.00	1.81	4.55	1.32	3.14	1.57
<i>t</i> value	6.79*		5.76*		4.46*	

* $p < .001$.

Final versus non-final outcome

Of the 69 participants in the regret conditions, 35 indicated that they preferred information about how their outcome related favourably to those of a larger sample of participants. The remaining 34 participants indicated that they preferred information about the type of items used in the test. As expected, preference for information depended on outcome finality. Of the 36 respondents in the final outcome condition, 23 chose favourable base-rate information (64%), while 13 chose information about the content of the test (36%). Of the 33 participants in the non-final condition, 11 chose favourable base-rate information (33%), while the remaining 22 chose information about the type of items used in the test (67%). This difference was significant: $\chi^2(1) = 6.64, p = .01$.

To examine this with parametric tests, we calculated an index score based on participants' preference for type of information (-1 or $+1$) multiplied by the certainty of their choice for either type of information ($M = 0.20, SD = 5.13$), where negative scores (up to -7) reflected a preference for favourable base-rate information and positive scores (up to $+7$) reflected a preference for information about the items used in the general knowledge test and were less or more certain of their decision.

Next, we examined if participants' preferences were related to outcome finality. We performed a univariate ANOVA with condition (final vs. non-final) and choice (choosing to gamble or play it safe) as between-participants factors and the index score as a dependent variable. Results showed no main effect for choice (gamble or not) and no interaction between choice and outcome finality ($F_s < 1$). The results however do reveal

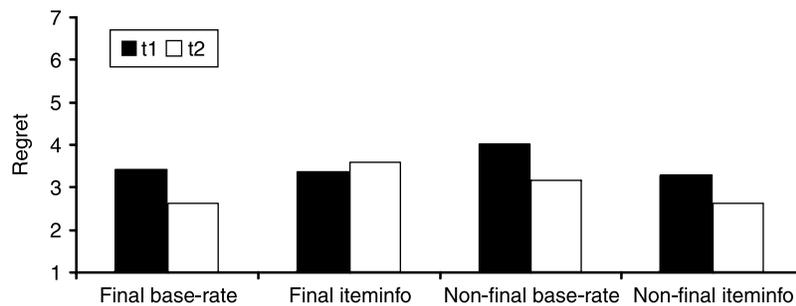


Figure 2. Levels of regret in the final and non-final outcome conditions by choice at T1 and T2, Study 2.

a main effect of final versus non-final outcome ($F(3, 65) = 5.39, p < .05$). More specifically, we found lower scores in the final outcome condition ($M = -1.17$) as compared to the non-final condition ($M = 1.72$), confirming our expectation that preference for information depends on whether the outcome is final.

Regret

We measured regret and overall positive and negative feelings twice, to allow us to examine temporal effects. We performed a mixed design ANOVA with choice (favourable base-rate vs. content information about the test), length of memory task (10 vs. 20 minutes) and condition (final vs. non-final) as between-participants variables and time as a within-participants variable. The results show a main effect for time, with lower regret scores at T2 than T1 ($F(4, 65) = 6.98, p = .01$). More interestingly, we also observed a three-way interaction between time, condition, and choice ($F(4, 65) = 3.26, p = .05$). This interaction is depicted in Figure 2. Decomposing this three-way interaction shows a significant decrease in regret in the final outcome condition for participants choosing base-rate information ($F(1, 65) = 7.98, p = .01$). There was also a decrease in regret in the non-final condition for participants choosing information about the test ($F(1, 65) = 7.44, p = .01$). No significant effects were obtained in the two remaining conditions. There were no other main or interaction effects and similar analyses of positive and negative affect scores revealed no main or interaction effects of choice for information or experimental condition.

GENERAL DISCUSSION

In two studies, we investigated how comparing one's own experienced outcomes to those experienced by others influences post-decisional feelings of regret. We examined strategies people use to reduce the intensity of this emotion and also assessed how features of the decision outcome interact with these strategies. The first study showed that base-rate information that makes one's performance compare favourably to those of others leads to less regret than unfavourable base-rate information. This is in line with earlier work on counterfactual thinking (e.g. Markman & McMullen, 2003; Markman et al., 1993) showing that downward counterfactuals help people to cope with misfortune. The current studies extend this work by showing that information about the prevalence of the counterfactual leads to lower regret. Base-rate information that makes one's performance compare unfavourably to others did not lead to greater regret, in accordance with work by Krosnick and Sedikides (1990).

In the second study, we extended this finding by examining the conditions under which people prefer to rely on self-other comparisons following a disappointing outcome. We did this by examining regret resulting from a decision with a final versus non-final outcome. Results of this study showed that people prefer information that helps them to perform better in the future when an outcome is not final. However, people prefer information about (less fortunate) others when there is *no* opportunity to obtain a better outcome in the future.

These two strategies were related to subsequent levels of regret. In the case of a *final* outcome, the selection of base-rate information that put participants' own outcomes (and decisions) in a better light was associated with reduced regret. In the case of a *non-final* outcome, information that might help to enhance future performance was associated with reduced regret. We believe that the lower regret in this condition might have been due a shift in participants' focus from the negative event in the past to possible better outcomes in the future.

The present studies suggest that people deal with regret management strategically and adapt to the specifics of the situation that caused regret. Gilovich and Medvec (1995) have made a distinction between psychological and behavioural repair work, where the former involves positive reframing, such as re-evaluating an outcome or focusing on the so-called 'silver linings'. One way of interpreting the current results is to argue that people faced with final outcomes are inclined to engage in psychological forms of repair work (such as comparing their own outcomes to those experienced by less fortunate others), whereas people faced with non-final outcomes are more inclined to engage in behavioural strategies such as seeking information about the content of the quiz. The latter strategy appears to be more directed towards preventing future regret than towards managing current feelings of regret.

Two aspects of the present findings should be emphasized. First, levels of regret are rather low in both studies, perhaps partly because of our emphasis on experienced, as opposed to imagined regret. While most studies rely on scenarios and people's ability to imagine certain outcomes, we manipulated experienced regret more directly. There are obvious limits to the aversiveness of outcomes with which participants can be confronted in experimental setting. This inevitably affected the intensity of regret experienced in this study. Second, the pattern of results of Study 2 does suggest that participants in the final outcome condition who chose information about the test experienced the most regret. Indeed, their regret was not lower at T2 than at T1. One possible explanation is that these were participants who had a pre-existing tendency to dwell upon missed opportunities, potentially explaining their relatively higher levels of regret at T2. Future research should investigate the factors that might lead some people to choose this type of information when confronted with a final outcome and what they aim to achieve with that choice.

While we have focused on final versus non-final outcomes, there are other decision characteristics that may also determine strategy preference. For example, Gilovich and Medvec (1995) have argued that people tend to experience more regret from *inactions* than from *actions* (see also Avni-Babad, 2003). These investigators argue that this is partly because inactions motivate less regret-repair work than actions on account of their lower levels of perceived responsibility. However, we believe that this is only the case for inactions that have a *final outcome* because inactions that have a non-final outcome can still lead to actions that undo regret. If, for example, one regrets not having bought that beautiful car at a discount, but also feels that similar opportunities will arise in the future, preparing for these subsequent opportunities could be a way to deal with feelings of regret. Learning more about the various options could be one way of achieving this.

As shown by various researchers, the anticipation of regret plays an important role in risk-taking behaviour such as smoking, driving behaviour, and practising unsafe sex (e.g. Manstead & Parker, 1995, Richard, Van der Pligt, & De Vries, 1996). If it is the case that people deal with feelings of *anticipated* regret in ways similar to *experienced* regret, the findings presented in this paper may also apply to the realm of behavioural change strategies. More specifically, when the aim is to change risk-taking behaviours by emphasizing possible subsequent feelings of regret, one should be mindful about how to frame the possible negative consequences. If, in relation to health behaviours, the emphasis is on an irreversible negative outcome, such as a chronic disease or death, this could lead the receiver to engage in biased processing such as focusing more on others who run an even greater risk (e.g. 'my brother smokes more than I do'). Thus, the receiver of such a message might reduce (anticipated) regret without showing the desired change in risky behaviour. When framing the message in terms of a non-final outcome, however, the receiver may be more likely to show the desired effect of aiming to reduce (anticipated) regret by focusing on information that can help to change one's behaviour and avoid regret in the future.

In this paper, we have aimed to show that the management of regret can take on different forms, depending on specific characteristics of the decision that caused regret. More specifically, we have aimed to show that social comparison processes can play an important role with respect to how we deal with feelings of regret. When there is no chance to do better in the future, misery seems to love (and even actively look for) company. If however there is a subsequent opportunity, regret can motivate us to do better next time. Or as the renowned journalist Arthur Brisbane expressed it: '*Regret for time wasted can become a power for good in the time that remains, if we will only stop the waste and the idle, useless regretting*'.

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References

- Abraham, D., & Sheeran, P. (2003). Acting on intentions: The role of anticipated regret. *British Journal of Social Psychology*, *42*, 495-511.
- Asch, S. E. (1956). Studies of independence and conformity: A minority of one against a unanimous majority. *Psychological Monographs*, *70*, (Whole no. 416).
- Avni-Babad, D. (2003). Mental undoing of actions and inactions in the absence of counterfactuals. *British Journal of Social Psychology*, *94*, 213-222.
- Bar-Hillel, M. (1980). The base-rate fallacy in probability judgments. *Acta Psychologica*, *44*, 211-233.
- Connolly, T., Ordóñez, L. D., & Coughlan, R. (1997). Regret and responsibility in the evaluation of decision outcomes. *Organizational Behavior and Human Decision Processes*, *70*, 73-85.
- Festinger, L. (1954). A theory of social comparison processes. *Human Relations*, *7*, 117-140.
- Fuller, T. (1732). *Gnomologia* (p. 42). Oxford, UK: Oxford University.
- Gilovich, T., & Medvec, V. H. (1994). The temporal pattern to the experience of regret. *Journal of Personality and Social Psychology*, *67*, 357-365.
- Gilovich, T., & Medvec, V. H. (1995). The experience of regret: What, when and why. *Psychological Review*, *102*, 379-395.
- Gilovich, T., Medvec, V. H., & Kahneman, D. (1998). Varieties of regret: A debate and partial resolution. *Psychological Review*, *105*, 602-605.

- Kahneman, D., & Miller, D. T. (1986). Norm theory: Comparing reality to its alternatives. *Psychological Review*, *93*, 136-153.
- Kahneman, D., Slovic, P., & Tversky, A. (1982). *Judgment under uncertainty: Heuristics and biases*. New York: Cambridge University Press.
- Krosnick, J. A., & Sedikides, C. (1990). Self-monitoring and self-protective biases in use of consensus information to predict one's own behavior. *Journal of Personality and Social Psychology*, *58*, 718-728.
- Kumar, P. (2004). The effects of social comparison on inaction inertia. *Organizational Behavior and Human Decision Processes*, *95*, 175-185.
- Larrick, R. P. (1993). Motivational factors in decision theories: The role of self-protection. *Psychological Bulletin*, *113*, 440-450.
- Manstead, A. S. R., & Parker, D. (1995). Evaluating and extending the theory of planned behaviour. In W. Stroebe & M. Hewstone (Eds.), *European review of social psychology* (Vol. 6, pp. 69-95). Chichester: Wiley.
- Markman, K. D., Gavanski, I., Sherman, S. J., & McMullen, M. N. (1993). The mental simulation of better and worse possible worlds. *Journal of Experimental Social Psychology*, *29*, 87-109.
- Markman, K. D., & McMullen, M. N. (2003). A reflection and evaluation model of comparative thinking. *Personality and Social Psychology Review*, *7*, 244-267.
- Medvec, V. H., Madey, S. F., & Gilovich, T. (1995). When less is more: Counterfactual thinking and satisfaction among Olympic medalists. *Journal of Personality and Social Psychology*, *69*, 603-610.
- Medvec, V. H., & Savitsky, K. (1997). When doing better means feeling worse: The effects of categorical cutoff points on counterfactual thinking and satisfaction. *Journal of Personality and Social Psychology*, *72*, 1284-1296.
- Mullen, B., & Goethals, G. R. (1990). Social projection, actual consensus and valence. *British Journal of Social Psychology*, *29*, 279-282.
- Mullen, B., & Hu, L. (1988). Social projection as a function of cognitive mechanisms: Two meta-analytic integrations. *British Journal of Social Psychology*, *27*, 333-356.
- Richard, R., Van der Pligt, J., & De Vries, N. K. (1996). Anticipated regret and time perspective: Changing sexual risk-taking behavior. *Journal of Behavioral Decision Making*, *9*, 185-199.
- Tykocinski, O. E., & Pittman, T. S. (1998). The consequences of doing nothing: Inaction inertia as avoidance of anticipated counterfactual regret. *Journal of Personality and Social Psychology*, *75*(3), 607-616.
- Van Dijk, W. W., van der Pligt, J., & Zeelenberg, M. (1999). Effort invested in vain: The impact of effort on the intensity of disappointment and regret. *Motivation and Emotion*, *23*, 203-220.
- Van Dijk, W. W., Zeelenberg, M., & Van der Pligt, J. (1999). Not having what you want versus having what you do not want: The impact of negative outcome on the experience of disappointment and related emotions. *Cognition and Emotion*, *13*, 129-148.
- Wills, T. A. (1981). Downward social comparison principles in social psychology. *Psychological Bulletin*, *90*, 245-271.
- Zeelenberg, M., & Beattie, J. (1997). Consequences of regret aversion 2: Additional evidence for effects of feedback on decision making. *Organizational Behavior and Human Decision Processes*, *72*, 63-78.
- Zeelenberg, M., Beattie, J., Van der Pligt, J., & De Vries, N. K. (1996). Consequences of regret aversion: Effects of expected feedback on risky decision making. *Organizational Behavior and Human Decision Processes*, *65*, 148-158.
- Zeelenberg, M., & Pieters, R. (1999). On service delivery that might have been: Behavioral consequences of disappointment and regret. *Journal of Service Research*, *2*, 86-97.
- Zeelenberg, M., Van Dijk, E., Van den Bos, K., & Pieters, R. (2002). The inaction effect in the psychology of regret. *Journal of Personality and Social Psychology*, *82*, 314-327.