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Myopic Regret Avoidance:

Feedback Avoidance and Learning in Repeated Decision Making*

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Abstract

Decision makers can become trapped by *myopic regret avoidance* in which rejecting feedback to avoid short-term *outcome regret* (regret associated with counterfactual outcome comparisons) leads to reduced learning and greater long-term regret over continuing poor decisions. In a series of laboratory experiments involving repeated choices among uncertain monetary prospects, participants primed with outcome regret tended to decline feedback, learned the task slowly or not at all, and performed poorly. This pattern was reversed when decision makers were primed with *self-blame regret* (regret over an unjustified decision). Further, in a final experiment in which task learning was unnecessary, feedback was more often rejected in the self-blame regret condition than in the outcome regret condition. We discuss the findings in terms of a distinction between two regret components, one associated with outcome evaluation, the other with the justifiability of the decision process used in making the choice.

KEYWORDS: Decision Making; Decision Regret; Feedback Avoidance; Learning; Myopic Regret Avoidance; Regret Aversion; Outcome Regret; Self-blame Regret

Myopic Regret Avoidance: Feedback Avoidance and Learning in Repeated Decision Making

Decision makers often face a dilemma as to whether or not to seek information about the outcomes of options they did not choose. They may seek, or deliberately avoid, information about the performance of a stock they decided not to purchase, of an employee they considered but did not hire, or of a product they examined but ultimately did not purchase. The dilemma is this: Receiving feedback on the outcome of unchosen options exposes the decision maker to the possibility of immediate painful regret if the unchosen option turns out to have done better than the chosen one. On the other hand the knowledge so gained may improve task knowledge and thus subsequent decisions, reducing regret in the longer term. Decision makers who shelter themselves from feedback on foregone options may thus minimize their experience of regret in the short term but at the cost of reduced task learning and decision quality in the longer term. We refer to this trap as *myopic regret avoidance.*

Regret can be defined as the emotion experienced "when realizing or imagining that our current situation would have been better, if only we had decided differently" (Zeelenberg & Pieters, 2007, p. 3). Phenomenologically, the regret experience involves feelings that one should have known better, thoughts about the mistake made, a feeling of kicking oneself, and a desire to undo to action that caused regret (Zeelenberg, van Dijk, Manstead, & van der Pligt, 1998). As the definition suggests, regret is an emotion that is cognitively laden in that it requires us to think about what would have been had we acted differently. Further, the definition highlights the important role of counterfactual thought because the experience of regret tends to involve a comparison of what is with what could have been (had one chosen differently).

Because regret is aversive, people are motivated to regulate it. In a very useful integrative review of existing regret research, Zeelenberg and Pieters (2007) developed a framework for

understanding regret regulation strategies. According to their regret regulation theory, regret regulation strategies are decision-, alternative-, or feeling-focused, and aim at either preventing (avoiding) future regret or managing current regret. Strategies used to manage current regret include such activities as justifying one's decision (decision-focused) and denying regret (feeling-focused). Strategies used to prevent future regret include such activities as increasing decision justifiability (decision-focused), anticipating regret (feeling-focused), and avoiding feedback about foregone alternatives (alternative-focused).

A large amount of research has shown that people try to avoid future regret. For example, in a field study Wroe, Turner, and Salkovskis (2004) compared different potential predictors of actual immunization decisions and found that "anticipated regret … was the strongest predictor of likelihood of immunizing the child" (p. 38), predicting 57% of the variance (demographic variables, in contrast, predicted only 1% of the variance). Reb (2008) found that regret aversion leads to more careful decision processing and thus higher decision justifiability. Evidence of regret avoidance has been found in a variety of domains including negotiations (Larrick & Boles, 1995), consumer decisions (Simonson, 1992), health-related decisions (Connolly & Reb, 2003; Richard, de Vries, & van der Pligt, 1998; Wroe, Turner, & Salkovskis, 2004), and laboratory gambles (Zeelenberg, Beattie, van der Pligt, & de Vries, 1996). In a repeated decision-making context, experienced regret can lead to ill-advised switching behavior when a good decision leads to a poor outcome (Ratner & Herbst, 2005), presumably in an effort to avoid repeated regret.

There is also evidence that decision makers sometimes employ the alternative-focused regret regulation strategy of choosing options that protect them from potentially regret-inducing feedback on foregone options (e.g., Josephs, Larrick, Steele, & Nisbett, 1992; Larrick & Boles,

1995; Zeelenberg et al., 1996; Zeelenberg & Beattie, 1997; however, see also Shani &

Zeelenberg, 2007). For example, one study found that negotiators were more likely to reach an

agreement when doing so could shield them from learning the outcome of their "BATNA" ("best

alternative to a negotiated agreement") than when they expected to learn about that outcome

(Larrick & Boles, 1995). Of course, feedback on the outcomes of foregone options not only

poses the threat of regret, when the chosen option underperforms the competition, but also the

opportunity for rejoicing, when the chosen option outperforms the competition (Bell, 1982;

Loomes & Sugden, 1982). However there is considerable evidence (e.g. Kahneman & Tversky,

1979; Taylor, 1991) that decision makers are more concerned with avoiding negative

experiences than they are with seeking positive ones. Our prediction, then, is that regret will

loom larger than rejoicing, and that feedback will be associated with anticipation of overall

negative emotions, consistent with some existing results (Larrick & Boles, 1995; Zeelenberg et

al., 1996, Zeelenberg & Beattie, 1997).

Other research found decision makers to be less likely to choose safe options over risky

options when they expected to receive full outcome feedback (i.e., on both options regardless of

their choice). When outcome feedback was expected only for the chosen option, however,

preference for the safe option increased. Choosing the safe option protects one from potentially

regret-inducing feedback since the outcome of the risky option is unknown; choosing the risky

option exposes one to regret, since the outcome of the safe option is known without feedback

(Zeelenberg et al., 1996; Zeelenberg & Beattie, 1997). Similarly, Mellers, Schwartz, Ho and

Ritov (1997) found that, in choices between binary gambles, regret was more intense when both

gambles were resolved by the outcome of a single spinner (making the outcome of the foregone

alternative unavoidable) than when two spinners were used (so that only the outcome of the

chosen gamble was revealed).

While these studies did not examine whether decision makers show myopic regret avoidance, they are at least consistent with the possibility. They are also consistent with recent theoretical work on a distinction between two components of decision-related regret (Connolly & Zeelenberg, 2002, who draw on a discussion by Baron & Hershey, 1988, of the common confusion between good decision outcomes and good decision processes). A first component, *outcome regret*, is associated with the evaluation of the outcome resulting from one's choice, and is typically dependent on one or more reference points, such as the outcomes of alternatives not chosen, the outcome one expected, the status quo, or the outcomes received by others (see also Boles & Messick, 1995). Outcome regret of this sort is closely related to disappointment. A second component, *self-blame regret*, is associated with a judgment that one made an unjustified decision – for example, that one decided hastily or used poor information. Such an unjustified decision induces feelings of regret closely related to self-blame.

The purpose of the present research is to examine whether regret aversion affects feedback seeking behavior in a situation of repeated choice among a set of uncertain options. Past research found that regret aversion led people in single-period decisions to make risk-averse choices in order to avoid feedback on foregone outcomes, resulting in a "regret premium" of about 10% relative to risk-neutral choices when feedback was inevitable (Larrick & Boles, 1995). It is likely that the costs associated with regret-induced feedback avoidance are even higher in repeated decision making. In addition to the premium caused by increased risk aversion, when a decision is faced repeatedly there is a potential informational cost to avoiding feedback on foregone options: the rejected information could have improved decisions in the future. Similar issues are discussed in the organizational context by Denrell & March, 2001, and

in economic choice contexts by Camerer & Ho, 1999. Spencer, Josephs & Steele, 1993, also point to a balance between pain and learning in the seeking of feedback.

If decision makers were entirely motivated to maximize information gain, they would always seek feedback (if it were free). However, to the extent that decision makers are myopically regret avoidant (i.e., try to avoid short-term outcome regret), we would expect them to avoid feedback on the outcomes of foregone options. Decision makers primed to be sensitive to outcome regret would be especially prone to such avoidance. Conversely those primed for self-blame regret would be more likely to seek feedback, as long as it promises to enhance task learning and improve decisions. We test these predictions in the following experiments. While our main interest lies in how regret aversion affects feedback seeking behavior, we also examine on a more exploratory basis effects of regret aversion on learning and performance in the decision tasks.

Study 1

We examined feedback seeking behavior in a laboratory study in which decision makers knew that they would repeatedly face a decision among the same three options, each offering uncertain real monetary outcomes. On each trial, after learning the outcome of their chosen option, they could choose to receive feedback on the outcomes of the two options they had declined. In the Control condition no special mention was made of possible outcome-related regret. In the Outcome Regret condition the possibility of experiencing regret as a result of unfavorable outcome comparisons was made especially salient. Past research has shown that decision makers' choices are more strongly aimed at avoiding regret when regret is made salient (Richard et al, 1998; Simonson, 1992). We expected that feedback avoidance would be more prevalent in the Outcome Regret condition than in the Control condition.

Method

Procedure and Manipulations

Participants engaged in a computer-based decision making task. Written instructions described the task, which consisted of 20 trials. In each trial participants had to choose one of three options, each of which carried uncertain monetary consequences. The same three options were presented on each trial. The outcome from each option was an amount of money drawn randomly from an underlying uniform probability distribution. No information on the means or ranges of these distributions was provided. Participants were given an initial endowment of $3, and received in addition their winnings from two randomly-selected trials in the game. Outcomes were given in experimental dollars, each worth one real cent. No positive payoff was guaranteed, but participants were assured that they could not lose any of their own money.

After this initial orientation to the game, participants in both conditions were told:

"After each choice the computer will determine the outcomes of the options. The program will then show you the outcome of the option you chose. You will then be given the choice to see the outcomes of the options you did not choose as well. After that you will go on to the next decision among the same three options."

The outcome regret manipulation was adapted from Simonson (1992) and included two components. First, participants in the Outcome Regret condition were told the following:

"Choosing to receive feedback on the outcomes of the options you did not choose means that you might find out that you would have done better if you had chosen another option, leading to regret."

Second, outcome regret salience was reinforced after each trial when participants in the Outcome Regret condition only were asked to rate how much they regretted their previous decision.

After each choice, participants learned about the outcome of the chosen option. They were then asked whether they wanted to receive feedback on the foregone options, which they received if their response was affirmative. Participants in the Control condition then moved on to the next decision; participants in the Outcome Regret condition rated their regret before moving on. At the end of the study, after about 25 minutes, participants were paid in cash in local currency as described above (endowment plus the outcomes of two randomly selected trials), debriefed, and thanked for participating.

Task structure

The uniform probability distributions from which outcomes were drawn were:

Option 1: U(-80, +40), Range = 120, EV = -20

Option 2: U(-40, +40), Range = 80, EV = 0

Option 3: U(0, +40), Range = 40, EV = +20

Option 3 was thus unambiguously the best and Option 1 the worst of the three alternatives considering both expected value and downward potential ("risk").[1]

Participants

Fifty-eight business students at a Singaporean university participated in exchange for course credit and monetary compensation depending on the outcome of their choices.

Measures

Feedback avoidance. After learning the outcome of their chosen option after each choice, participants were asked whether they would like to receive feedback about the outcomes of the options they did not choose. Their response ("get feedback" or "don't get feedback") was our measure of feedback avoidance.

Performance. Performance was assessed through choices. In each trial, participants chose

an option by clicking on one of three buttons on the screen. Choices were coded as 1 if they were optimal (Option 3), 0 otherwise (Options 1 or 2). This coding approach is based on the recognition that only choice of Option 3 achieves the decision makers' goal of choosing the best option (highest EV and least downward potential), whereas choice of any other option does not.[2]

Results

Outcome Regret and Feedback Seeking

As expected, the experimental priming of outcome regret affected feedback seeking, $\chi^2(1)$ = 26.55, $p < .001$ (see also Figure 1). The 30 participants in the Control condition declined feedback on the foregone options in 46 out of 600 choices (7.7%; 19 of the feedback-avoiding choices were contributed by a single individual). In contrast, the 28 participants in the Outcome Regret condition made 99 feedback-avoiding choices (out of 560: 17.7%). Further, more individuals always sought feedback in the Control condition (73.3%) than in the Outcome Regret condition (60.7%). Additional chi-square analyses showed that feedback avoidance was more common in the Control condition than in the Outcome Regret condition in both the first 10 rounds ($p < .01$) and the second 10 rounds ($p < .001$).

FIGURE 1 ABOUT HERE

Outcome Regret and Performance

We expected that participants in the Control condition would over time make better choices than those in the Outcome Regret condition, since they received more information through feedback seeking. Consistent with this prediction, optimal choices increased more strongly from the first 10 trials to the second 10 trials in the Control condition (from 128 to 219),

$\chi^2(1) = 56.60$, $p < .001$, than in the Outcome Regret condition (from 143 to 176), $\chi^2(1) = 7.93$, p < .01 (see Figure 2). Further, whereas optimal choices surprisingly were more frequent in the Outcome Regret condition in the first half of trials (143 out of 280, or 51.1%) than in the Control condition (128 out of 300, or 42.7%), $\chi^2(1) = 4.11$, $p = .05$, as expected, in the second 10 trials optimal choices were more common in the Control condition (219 out of 300, or 73.0%) than in the Outcome Regret condition (176 out of 280, or 62.9%), $\chi^2(1) = 6.86$, $p < .01$. These results were confirmed in a binary logistic regression that showed a significant interaction between experimental condition and trials, $B = .08$, $SE(B) = .02$, $Exp(B) = .92$, $Wald(df=1) = 12.75$, $p <$ .001. Taken together these results suggest that participants in the Outcome Regret condition were less able to improve their performance over time than participants in the Control condition.

FIGURE 2 ABOUT HERE

Discussion

Study 1 confirms the possibility of a damaging decision trap we have termed "myopic regret avoidance". We conceived the trap as a possibility in repeated decision making when a decision maker, attempting to avoid the regret she may feel if she learns the outcomes of options she did not choose, shields herself from feedback on these other outcomes – a finding that has been previously reported only for single-period decisions (Josephs et al, 1992; Zeelenberg et al, 1996). In repeated decisions, this feedback avoidance may impede task learning over time, and thus reduce decision quality and performance. Myopically avoiding short-term outcome regret may thus lead to increased longer-term regret. Consistent with this prediction, Study 1 found that decision makers primed with outcome regret avoided feedback more often. Moreover, these

participants showed less learning (probability of choosing the optimal option) over the repeated decision trials than participants in a control condition.

Of the two regret components proposed by Connolly and Zeelenberg (2002), the regret primed in Study 1 is clearly of the outcome regret type, which is associated with receiving an outcome that compares unfavorably to the outcome of a foregone option. What if one primed self-blame regret, which is associated with having made an unjustified decision? In the context of decision justification theory (Connolly & Zeelenberg, 2002) justification of a decision refers to justifying the decision process to oneself rather than to another person (as, for example, in the work on accountability; e.g., Lerner & Tetlock, 1999). A person experiences self-blame regret when (s)he cannot justify the decision to him- or herself as careful, thoughtful, or well-informed on the basis of such arguments as: "I made a careful decision", "I collected a lot of information" etc.

In the present context feedback-seeking could provide a later justification for one's decision ("I sought all the available feedback", "I tried to learn which option was best" etc.). Seeking feedback appears to be the reasonable, rational behavior in this situation because it provides additional information that can improve learning and long-term performance.[3] A decision maker who avoids feedback could later blame him- or herself for not acquiring information that could have improved subsequent decisions. We therefore predicted that participants primed for self-blame regret would acquire *more* feedback, and improve their task learning and performance more, than would participants not so primed. Study 2 was designed to test this prediction.

<div align="center">

Study 2

Method

</div>

Overview

Study 2 used the same basic decision task and monetary incentives as the previous study. Participants knew that they would repeatedly face a decision among the same three options, each offering uncertain real monetary outcomes. On each trial, after learning the outcome of their chosen option, they could choose whether or not to receive feedback on the outcomes of the two options they had declined. To increase the incentive to learn, we increased the number of trials to 50. To avoid a ceiling effect with respect to learning the best option we also made the option set more difficult to learn by increasing the ranges of outcomes as follows:

Option 1: U(-180, +120), Range = 300, EV = -30

Option 2: U(-130, +120), Range = 250, EV = -5

Option 3: U(-80, +120), Range = 200, EV = +20

Manipulation

Self-blame regret was primed by using an implicit priming task to minimize possible demand effects of explicit manipulation.[4] We used the scrambled sentence task paradigm (Bargh & Chartrand, 2000). In both Control and Self-blame Regret conditions, participants completed a seemingly unrelated scrambled sentence test before engaging in the decision making study. In this task, they had to form a total of 20 four-word sentences from five given words. In the Self-blame Regret condition, 11 of the 20 tasks contained words or expressions related to regret in general, and self-blame regret in particular (e.g., regrets, poor choice, foregone, mistake, blame self) (see Appendix for complete list). In the Control condition, no such words were included. In post-study questioning, no participants indicated any suspicion that the sentence forming task may have been used to manipulate regret salience, or may have been related to the subsequent decision making task.

Participants

Seventy-nine students at a Singaporean university participated for about 50 minutes in exchange for course credit and monetary compensation depending on the outcome of their choices.

<center>*Results*</center>

Self-blame Regret and Feedback Seeking

As expected, feedback seeking was affected by the manipulation of self-blame regret, $\chi^2(1) = 34.16$, $p < .001$ (see also Figure 1). Reversing the effect of outcome regret priming, self-blame regret priming led decision makers to seek *more* feedback. The 38 participants in the Control condition declined feedback on the foregone options in about 18.2% of all choices (345 out of 1900). In contrast the 41 participants in the Self-blame Regret condition avoided feedback in about 11.6% of all feedback choices (237 out of 2050). Less than half (47.4%) of participants in the Control condition always sought feedback, while 63.4% of participants in the Self-blame Regret condition did so. Further chi-square analyses showed that feedback avoidance was more common in the Control condition than in the Self-Blame Regret condition in both the first 25 choices ($p < .01$) and the second 25 choices ($p < .001$).

Self-blame Regret and Performance

We expected that participants in the Self-blame Regret condition would over time make better choices than those in the Control Regret condition, since they received more information through feedback seeking. Consistent with this prediction, optimal choices increased significantly from the first 25 trials to the second 25 trials in the Self-blame Regret condition (from 414 to 484), $\chi^2(1) = 9.71$, $p < .01$, but not in the Control condition (368 vs. 401), $\chi^2(1) = 2.38$, $p = .12$ (See Figure 3). Further, optimal choices were more common in the Self-blame

Regret (484 out of 1025, or 47.2%) than in the Control (401 out of 950, or 42.2%) condition in the second 25 trials, $\chi^2(1) = 5.00$, $p < .05$, but not in the first, $\chi^2(1) = .56$, $p = .45$ (Self-blame Regret, 414 out of 1025, or 40.4%, Control, 368 out of 950, or 38.7%). Despite these results, a binary logistic regression did not show a significant interaction between experimental condition and trials, $B = .002$, $SE(B) = .004$, $Exp(B) = 1.00$, $Wald(df=1) = .23$, ns. Nevertheless, taken together the results suggest that participants in the Self-blame Regret condition were better able to learn over time to choose the best option than participants in the Control condition.

FIGURE 3 ABOUT HERE

Discussion

Study 1 showed how priming outcome regret can lead decision makers to fall into a myopic regret avoidance trap by rejecting feedback on foregone options. Study 2 reversed this tendency to feedback avoidance by priming self-blame regret. The results suggest that trying to avoid self-blame regret leads to more feedback seeking, which can enhance learning and decision quality.

One concern regarding the comparability of Study 1 and Study 2 is the difference in the experimental manipulations of outcome and self-blame regret, respectively. Whereas outcome regret was primed explicitly in the instructions and implicitly through measurement of experienced regret in Study 1, self-blame regret was primed implicitly in Study 2 through an "unrelated" task, to avoid potential demand effects. Study 3, which follows, was designed to address this potential confound by comparing the effects of outcome and self-blame regret primed by identical methods within a single study.

Study 3

Method

Study 3 used the same decision task, option set, number of trials (50), and monetary

incentives as Study 2. Both self-blame regret and outcome regret were primed through the

"unrelated" scrambled sentence task used in Study 2. In both conditions, participants were asked

to form a total of 20 four-word sentences from five given words. In the Outcome Regret

condition 10 of the 20 tasks contained words related to regret in general, and outcome regret in

particular (e.g., regrets, pain, loss, outcome, foregone, compared). In the Self-blame Regret

condition 10 of the 20 tasks contained words related to regret in general, and self-blame regret in

particular (e.g., regrets, pain, mistake, justifiable, fault, blame self) (see Appendix for a complete

list).

Seventy-seven business students at a Singaporean university participated for about 50

minutes in exchange for course credit and monetary compensation depending on the outcome of

their choices.

Results

Self-blame Regret, Outcome Regret, and Feedback Seeking

As expected, feedback seeking was more common when self-blame regret rather than

outcome regret was primed, $\chi^2(1) = 168.12, p < .001$ (see also Figure 1). The 38 participants in

the Self-blame Regret condition declined feedback on the foregone options in about 10.7% of all

choices (203 out of 1900). In contrast the 39 participants in the Outcome Regret condition

avoided feedback in about 27.1% of all feedback choices (528 out of 1950). While less than half

of participants (46.2%) in the Outcome Regret condition always sought feedback, the majority of

participants (60.5%) in the Self-blame Regret condition did so. Further chi-square analyses

showed that feedback avoidance was more common in the Outcome Regret condition than in the Self-Blame Regret condition in both the first 25 choices ($p < .001$) and the second 25 choices ($p < .001$).

Self-blame Regret, Outcome Regret, and Performance

We expected that performance would improve more strongly in the Self-blame Regret condition. Consistent with this prediction, optimal choices increased significantly from the first 25 trials to the second 25 trials in the Self-blame Regret condition (from 405 to 449), $\chi^2(1) = 4.12$, $p < .05$, but not in the Outcome Regret condition (408 vs. 396), $\chi^2(1) = .31$, $p = .61$ (see Figure 4). Further, optimal choices were more common in the Self-blame Regret (449 out of 950) than in the Outcome Regret (396 out of 975) condition in the second 25 trials, $\chi^2(1) = 8.63$, $p < .01$, but not in the first, $\chi^2(1) = .12$, $p = .75$ (Self-blame Regret, 405 out of 950, Outcome Regret, 408 out of 975). These results were confirmed in a binary logistic regression that showed a significant interaction between experimental condition and trials, $B = .11$, $SE(B) = .01$, $Exp(B) = 1.01$, $Wald(df=1) = 5.66$, $p < .05$. Follow-up analyses found a significant increase in optimal choices over trials in the Self-blame Regret condition ($p = .01$), but not in the Outcome Regret condition ($p = .42$). Taken together, these results suggest that participants in the Self-blame Regret condition were better able to learn over time to choose the best option than participants in the Outcome Regret condition.

FIGURE 4 ABOUT HERE

Discussion

As expected, Study 3 showed that when it comes to feedback seeking behavior it matters

what type of regret decision makers are trying to avoid. Those sensitized to outcome regret

rejected feedback on foregone options more than did those primed to self-blame regret. This led

to marked differences in task learning, decision quality and performance favoring the self-blame

regret group.

These findings make sense from the perspective of decision justification theory

(Connolly & Zeelenberg, 2002). When the salience of self-blame regret is high, decision makers

are particularly concerned about acting in a way that they perceive as justifiable. In the present

context, this implies seeking feedback on the foregone options' outcomes in order to maximize

information gain. However, this appears to conflict with the notion of the self-protective decision

maker (Einhorn & Hogarth, 1978; Josephs et al, 1992; Larrick, 1993; Larrick & Boles, 1995).

For a self-protective decision maker, learning that another option would have led to a better

outcome prompts the decision maker to question the wisdom of his or her choice, leading to

recrimination and regret (Sugden, 1985). Thus, seeking feedback may lead to self-blame over

having made the wrong choice. This line of reasoning suggests that factors that increase concern

for self-protection, such as low self-esteem (Josephs et al, 1992) or salience of self-blame regret,

can actually *decrease* feedback seeking, contrary to the present findings.

One way to resolve this potential conflict is by considering the potential benefit for

learning through the feedback. Low self-esteem, for example, may lead to more feedback

seeking when this information can help prevent future failure, but less feedback seeking when

this information cannot prevent future failure (Spencer et al, 1993). Similarly, we would expect

that self-blame regret salience would lead to more feedback seeking when the information gained

can help the individual make better choices in the future. However, when the available feedback

does not provide information that can improve future decisions, we would expect self-blame

regret salience to lead to less feedback seeking than outcome regret salience. This prediction is tested in Study 4.

Study 4

Method

Study 4 used the same number of trials (50), monetary incentives, and experimental manipulations of outcome and self-blame regret as Study 3. However we changed the decision making task so that information on the probability distributions of payoffs for all three options was provided to all participants in the initial experimental instructions. Feedback on the outcomes of foregone options would thus provide no additional information. As a result, there was no learning incentive to seek feedback on the outcomes of the foregone options.

The payoff distributions were U(-80,+120), U(-100,+150) and U(-120,+180), chosen so as to have the same ranges as those in Study 3. However, in order to make the decision task non-trivial, the highest expected value option now had the biggest range (risk) and both the largest upward and downward potential.

One-hundred-four business students at a Singaporean university participated for about 50 minutes in exchange for course credit and monetary compensation depending on the outcome of their choices.

Results and Discussion

Overall participants' choices favored the riskiest option (43.2%), compared to 32.7% choosing the moderate-risk option and 24.2% the safest option. Consistent with the assumption that priming self-blame regret would lead to more self-protective decisions, we found that participants in the Self-blame Regret condition chose the safest option more often (26.5%) than participants in the Outcome Regret condition (21.7%), who preferred the moderate-risk option

more strongly (34.8% versus 30.6% in the Self-blame Regret condition), with no differences in choice of the riskiest option (Outcome Regret, 43.5%, Self-blame Regret, 42.9%), $\chi^2(2) = 19.39$, $p < .001$. Most participants chose each of the three options a substantial number of times. Only four of 53 participants (7%) in the Self-blame Regret condition, and three of 51 participants (6%) in the Outcome Regret condition, chose the same option on all fifty trials. Feedback avoidance was somewhat more common after making the riskiest choice: 26% vs. 20% for the two less-risky options. Despite having full prior information about the range of payoffs each option offered, participants appear to have done considerable shifting between options, and sought feedback about foregone options after the majority of their option choices.

Our central interest was in whether the two regret priming conditions would show differential effects on feedback avoidance in this no-learning task. They did. As expected, and opposite the results of Study 3, feedback seeking was now more common when outcome regret rather than self-blame regret was primed, $\chi^2(1) = 92.39$, $p < .001$ (see also Figure 1). The 53 participants in the Self-blame Regret condition declined feedback on the foregone options in about 28.4% of all choices (752 out of 2650). In contrast the 51 participants in the Outcome Regret condition avoided feedback in about 17.2% of all feedback choices (438 out of 2550). Whereas less than half (41.5%) of participants in the Self-blame Regret condition always sought feedback, the majority of participants (52.9%) in the Outcome Regret condition did so. Further chi-square analyses showed that feedback avoidance was more common in the Self-blame Regret condition than in the Outcome Regret condition in both the first 25 choices ($p < .001$) and the second 25 choices ($p < .001$).

These results support the prediction that the relationship between type of regret primed and feedback seeking depends on the nature of the decision task. If the task is such that seeking

feedback on the outcomes of foregone options can be expected to contribute to learning (as in

Study 3), decision makers sought more feedback when self-blame regret was salient than when

outcome regret was salient. However, when the task is such that this feedback is not expected to

contribute to learning (as in Study 4), self-blame regret salience led to less feedback seeking.

General Discussion

This series of studies has examined the possibility that in repeated decisions, decision

makers may become caught in a damaging decision trap we have termed "myopic regret

avoidance". The trap arises when decision makers, attempting to avoid the regret they may feel if

they learn the outcomes of unchosen options, shield themselves from feedback on these other

outcomes, a tendency that has been reported in single-period decisions (Josephs et al, 1992;

Zeelenberg et al, 1996). Such feedback avoidance can impede task learning, and degrade

decision quality, thus exacerbating long-term regret. The proposed mechanism is driven by the

outcome regret component of Connolly and Zeelenberg's (2002) distinction. The second

component, self-blame regret, would be expected to have the opposite effect, leading to

increased feedback seeking when task learning is possible.

In our first three experiments participants chose repeatedly among the same three options,

each of which offered an uncertain monetary outcome. The underlying distributions of payoffs of

the three options were initially unknown to the participants but could be (partially) learned by

getting outcome feedback. After each choice participants were told the outcome only of their

chosen option, but were given an opportunity to get feedback on the outcomes they would have

received if they had chosen each of the other options. Participants were assigned either to a

control condition (Studies 1 and 2) or to an experimental condition in which outcome regret

(Studies 1 and 3) or self-blame regret (Studies 2 and 3) was primed.

In Study 1 priming outcome regret led to increased feedback avoidance relative to a control condition. Primed participants also exhibited poorer task learning and decision quality. In contrast, priming self-blame regret (Study 2) led to increased feedback seeking relative to a control condition. Primed participants learned more and performed better on the decision task. In Study 3, feedback seeking was more common, and learning stronger, after self-blame regret priming than outcome regret priming.

These findings dovetail neatly with the distinction proposed by Connolly and Zeelenberg (2002; cf. Connolly & Reb, 2005) between outcome regret and self-blame regret. Outcome regret is associated with receiving a comparatively poor outcome; self-blame regret is driven by the perceived justifiability of the decision process (Connolly & Reb, 2005). Outcome regret avoidance led decision makers to avoid the immediate regret stemming from feedback on foregone outcomes. However, it also led to reduced learning and performance: the myopic regret avoidance trap. In contrast, both feedback seeking and performance increased when self-blame regret was primed, suggesting that efforts to avoid this regret component can help decision makers to avoid the trap.

A similar dilemma between short-term and long-term effects has been discussed in the closely related counterfactual thinking literature (e.g., Roese, 1997; Roese & Olson, 1995). *Upward counterfactuals*, comparisons with better outcomes that could have been received, are thought to lead to more immediate pain but to help improve future decision making. *Downward counterfactuals*, comparison with worse outcomes that could have been received, are thought to lead to more positive immediate emotions but not to learning. Some research suggests that individuals produce more upward counterfactuals when they expect to make repeated decisions (Markman, Gavanski, Sherman, & McMullen, 1993) and generate more counterfactual thoughts

about antecedents of a decision they have control over (Markman, Gavanski, Sherman, & McMullen, 1995). Future research could examine whether regret salience also moderates the production of upward versus downward counterfactuals.

In Studies 1-3 full feedback, though threatening potentially painful outcome regret, was the justifiable, rational thing to do since it provided information that might improve subsequent decisions, reducing self-blame regret. In Study 4, participants were told beforehand the distributions underlying the three available options. Thus, the learning objective was eliminated as a justification for seeking feedback. Consistent with the notion of the self-protective decision-maker (Josephs et al, 1992; Larrick, 1993), we expected more feedback avoidance after self-blame regret priming. Participants primed for self-blame regret received no task-learning benefit from seeking feedback to compensate them for the heightened challenge to their decisional competence of realizing that an alternative choice would have yielded a better outcome. Avoiding such a challenge, they declined feedback significantly more often than did participants primed for outcome regret. The results suggest that both regret avoidance and self-protection motives are particularly influential in the absence of learning and performance motives.

Limitations and Future Research

The findings are, of course, subject to the usual cautions associated with generalizing from laboratory experiments involving student participants, unfamiliar tasks and small incentives. They constitute no more than an existence proof, a demonstration that efforts to avoid outcome regret *can* lead to a myopic regret avoidance trap, while efforts to avoid self-blame regret can lead to increased feedback seeking and improve learning and performance. Our findings raise the question whether these effects have important real-world analogs. For example, in the area of financial decision making, fear of outcome regret might lead investors to seek less

feedback on the performance of stocks they considered but did not buy, and this may result in poorer performance over time. On the other hand, fear of self-blame regret might lead to more feedback seeking and better performance over time. Similarly, in an organizational context, fear of outcome and self-blame regret might affect feedback seeking, and subsequent learning and future performance, following decisions such as which person to hire, which graduate student to admit to a PhD program, or what project to invest in. Undoubtedly, future studies extending the current findings to such important decision domains would be very useful.

An obvious extension of the current studies would be to test whether outcome and self-blame regret aversion can be induced not only externally by regret-related thoughts but also by stable individual differences in the likelihood to experience regret (e.g. Josephs et al, 1992; Schwartz et al, 2002). Individuals who are more inclined to experience regret associated with their decision outcomes might be particularly prone to entrapment by myopic regret aversion because their anticipated and experienced outcome regret might lead them to avoid feedback in repeated decision situations, possibly resulting in less learning. Sadly, this reasoning suggests that individuals who most dread the pain of regret may also be those most likely to encounter it, as their short-term avoidant strategies lead them more frequently to long-term poor decisions.

Conclusion

This research contributes to the discussion of whether regret in particular (e.g., Bittner, 1992; Sugden, 1985; Zeelenberg, 1999) and emotions in general (e.g., Damasio, 1994; Elster, 1996; 1998; Frank, 1988) are a help or a hindrance in decision making. It has been argued that experiencing regret is essential for learning to improve one's decisions in the future (Roese, 2005). Regret can tell us that we could have done better by choosing a different option, perhaps increasing the probability of better choices (and thus less regret) in the future. It is, however,

painful in the short run. Whether regret avoidance leads to better or worse decision making depends on the way in which decision makers try to avoid regret. If they try to avoid (outcome) regret by avoiding potentially regret-inducing feedback, they are likely to continue over time to make poor (and regrettable) decisions. Such feedback avoidance may have substantial negative effects on learning and performance in repeated decision making tasks. It is in this sense that we refer to myopic regret avoidance as a trap. If, on the other hand, decision makers try to avoid (self-blame) regret by seeking feedback on foregone options, accepting immediate regret in order to learn to improve their future decision making, the influence of regret aversion on decision making seems beneficial.

ENDNOTES

[1] In a pilot study we used a task in which the three payoff distributions were U(-80,+120), U(-125,+125) and U(-180,+120). This proved too hard a task for participants to show significant learning over 20 trials, since all three gambles yielded a wide range of positive and negative outcomes. Interestingly, the outcome regret manipulation led to substantially more feedback avoidance than in Study 1. This is consistent with our proposed mechanism of a tradeoff between short-term and long-term regret. In the high-variance gambles, there was plenty of short-term pain for the regret-salient subjects, and no long-term gain in the form of task learning. Many of our subjects chose to reduce the short-term regret by refusing feedback.

[2] We have also performed the analyses reported below maintaining the distinction among the three options. Because these analyses yielded essentially the same results, for clarity we present analyses of the binary measure collapsing the worst and second-best options.

[3] Note that more information through feedback on the foregone or received outcomes does not necessarily lead to learning and better future decision making (e.g., Brehmer, 1980; Hogarth, McKenzie, Gibbs, & Marquis, 1991; Kluger & DeNisi, 1996) even though that seems to be the case in the specific decision task used in the present studies. For example, Thaler, Tversky, Kahneman, and Schwartz (1997) showed how the combination of *myopic loss aversion* and frequent outcome feedback can lead to worse decisions over time. What we are arguing is that, from the perspective of a decision maker, it is the justifiable and reasonable thing to do to seek (free) feedback, rather than to avoid it (after all, even if there is no guarantee that the additional information will help, it is certain that the information one does not even seek cannot help).

[4] Given the issues of justification and blame involved (Tetlock & Lerner, 1999), we were more concerned about such potential demand effects in this case than in the case of outcome regret.

APPENDIX

Words and expressions used in Study 2 to prime *self-blame* regret:

worried; carefully; wish otherwise; pain; poor choice; foregone; mistake; blame self; compared;

loss; regrets

Words and expressions used in Studies 3 and 4 to prime *outcome* regret:

worried; wish otherwise; pain; lost; regrets; bad luck; outcome; compared; loss; forgone

Words and expressions used in Studies 3 and 4 to prime *self-blame* regret:

worried; carefully; pain; poor choice; regrets; mistake; decision process; blame self; justifiable;

fault

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Figure 1: Mean percentage of choices avoiding feedback on foregone options by experimental

condition for Studies 1-4
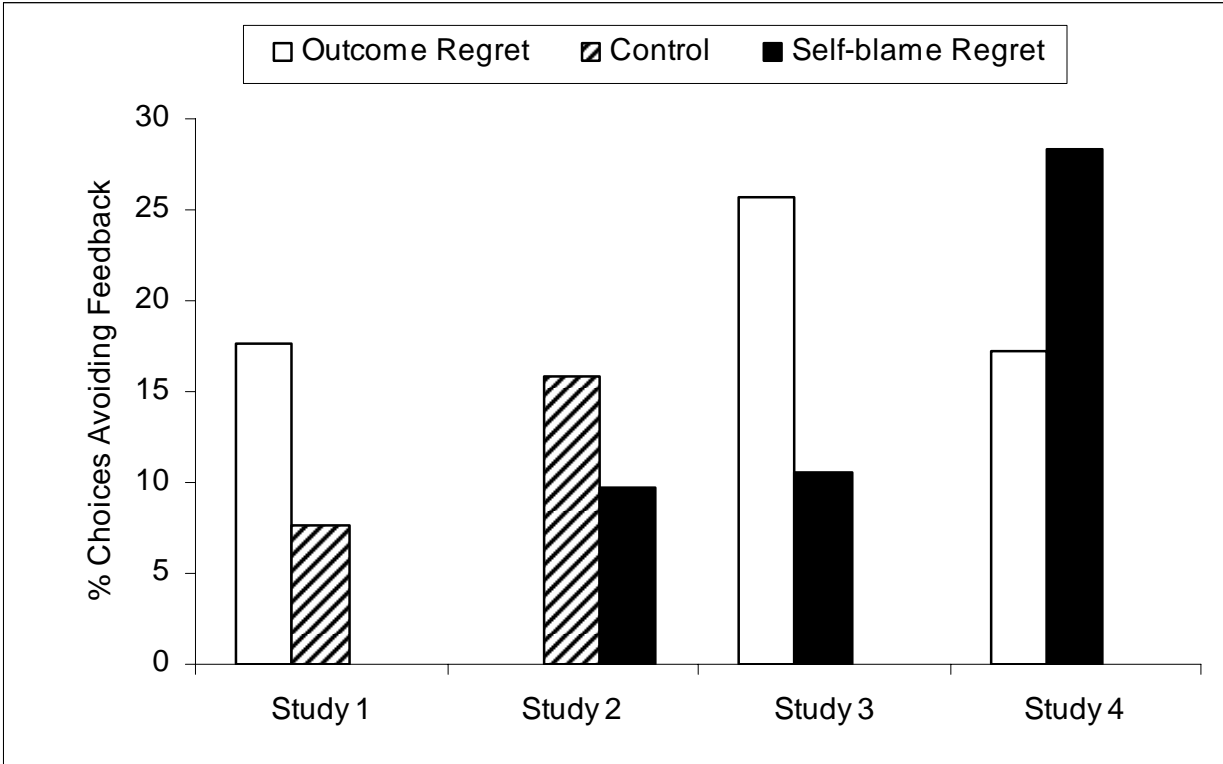
 Notes. Studies 1-3 used a learning task in which feedback seeking provided useful information

about the nature of the available options; Study 4 used a no-learning task in which feedback

seeking did not provide new information about the nature of the available options.

Figure 2: Mean percentage of choices of best option, by block of trials and experimental
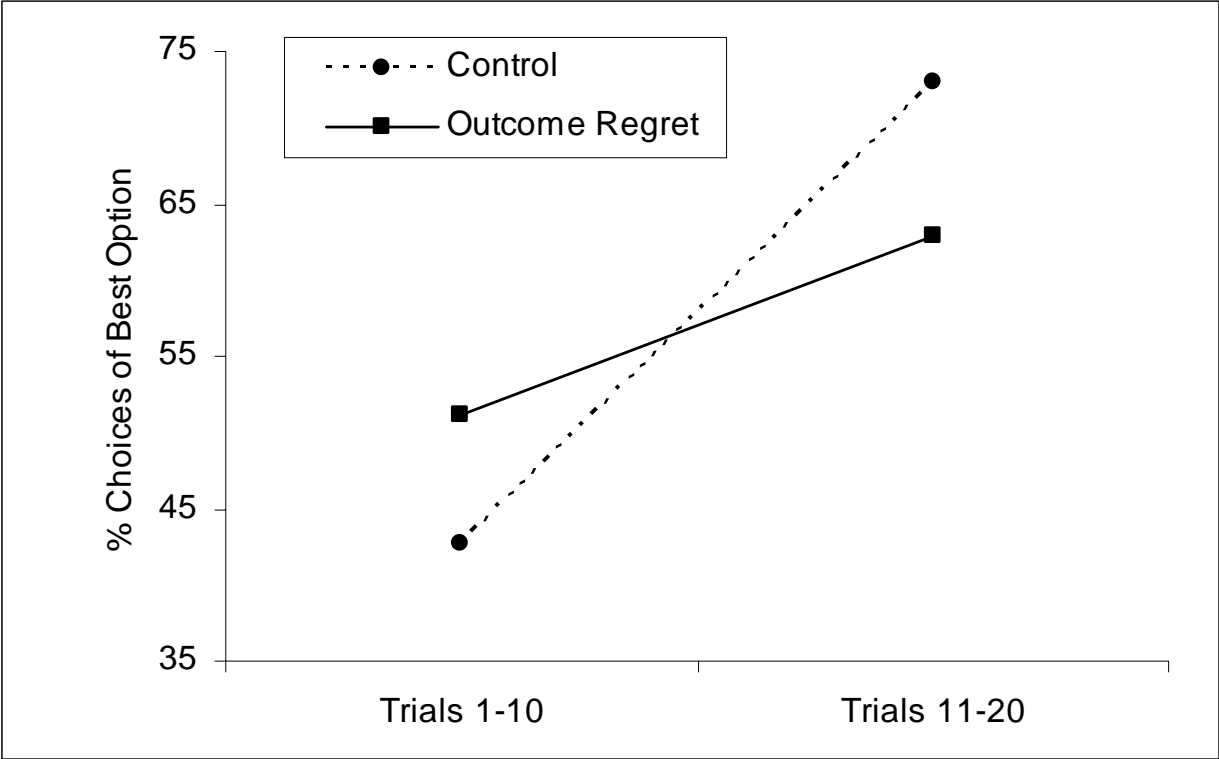
condition, Study 1

Figure 3: Mean percentage of choices of best option, by block of trials and experimental

condition, Study 2

Figure 4: Mean percentage of choices of best option, by block of trials and experimental

condition, Study 3