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The use of crying over spilled milk: a note on the rationality and functionality of regret

MARCEL ZEELLENBERG

ABSTRACT *This article deals with the rationality and functionality of the existence of regret and its influence on decision making. First, regret is defined as a negative, cognitively based emotion that we experience when realizing or imagining that our present situation would have been better had we acted differently. Next, it is discussed whether this experience can be considered rational and it is argued that rationality only applies to what we do with our regrets, not to the experience itself. Then, research is reviewed showing that both the anticipation of future regret and the experience of retrospective regret influence behavior. The influence of anticipated regret can be considered rational as long as the decision maker can accurately predict the regret that may result from the decision. The influence of experienced regret cannot be considered rational, since decisions should be based on future outcomes, not historical ones. However, influence of experienced regret can be called functional since it may result in increased learning from our mistakes.*

The standard version of the rational choice model has proven its usefulness for understanding and predicting human behavior. But it remains seriously incomplete. Most analysts regard “irrational” behavior motivated by the emotions as lying beyond the scope of the model. But it is neither necessary nor productive to adopt this view. With careful attention to the things people care about, we can greatly enrich our understanding of why we behave as we do. (Frank, 1988, p. 783)

Theories of rational choice view decision making as a cold cognitive process. Decision makers are supposed to rationally calculate for all possible courses of action the utility of each possible outcome, and weigh the utilities with the probability that each outcome will occur. They then choose the course of action that provides them with the highest (expected) utility. Emotions are neglected in these theories. In reality, however, decision outcomes are known to be powerful antecedents of emotional experiences and these emotions may well influence the

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choices we make. This article deals with the rationality and functionality of one specific emotion, regret. Regret is the negative, cognitively based emotion that we experience when realizing or imagining that our present situation would have been better had we acted differently. It is the typical emotion we may feel when decisions go awry [1]. Should regret, or more general emotions, be included in our theories of rational choice? The quotation with which this article started suggests we should. The present article elaborates on that recommendation.

Several alternative approaches to decision making that take the influence of regret into account have been developed. For example, in the 1950s, researchers argued that we sometimes base our decisions on a “*minimax regret*” principle (e.g. Luce & Raiffa, 1957; Savage, 1951; see also Acker’s 1997 approach of *tempered regrets*). This principle holds that one computes the maximum of possible regret (defined as the difference between the actual outcome of the chosen option and the highest possible outcome of the rejected options) for each option, and then chooses the option where this maximum regret is smallest. The minimax regret rule is useful when there is no knowledge whatsoever about the probabilities of the possible outcomes, because this information is not needed and not taken into account even when it is present.

More recently, the economists Bell (1982) and Loomes and Sugden (1982) formulated decision theories that also take the probability of regret into account. The main assumptions of their *Regret Theory* have been supported in empirical research. These assumptions are that we may experience emotions as a consequence of our decisions. Decision makers experience regret when the outcome of the rejected option would have been better, and rejoicing when the outcome of the rejected option would have been worse (e.g. Mellers *et al.*, 1997; Zeelenberg *et al.*, 1998d). These emotions have an impact on how we evaluate decision outcomes (e.g. Inman *et al.*, 1997). And finally, this impact of regret is taken into account before we decide, and thus may play an important role in determining what we choose (a detailed account of this influence is provided later in this article).

For example, a decision to buy a particular house can result in enormous regret if shortly after the act of buying, house prices drop dramatically. Consequently we may enjoy living in that house less than we would have otherwise. Even in more day to day decision making emotional experiences may play a role. For example, going to the cinemas and seeing an awful movie can really get us down, especially when we later learn that another movie that we considered was extremely good. Finally, even trivial decisions, such as choosing which cash register to line up at in a supermarket, can produce feelings of regret when the line we are in does not proceed as quickly as others do. Anticipations of these emotional reactions may influence what we choose, which particular house, movie, or cash register, but also *how* we choose. That is, negative emotions may prompt us to delay decisions (Beattie *et al.*, 1994) and influence the amount and direction of pre-decisional information search (Luce, 1998). Thus, when making decisions we not only predict the utility that will be provided by these options, as assumed in rational choice theory, we also predict the emotions that arise from comparing the result of that option with the results of options forgone.

In this article I review recent developments in the psychology of regret and discuss how regret influences our decision making. In particular, I address the issue of whether it is rational to let regret influence our choices. First, I consider the experience of regret itself.

What is regret?

Although regret was defined above, it may still be useful to depict, in somewhat more detail, what the experience of regret entails (see also Gilovich & Medvec, 1995; Landman, 1993). Regret is a cognitive emotion: it is an emotion that needs cognition to be experienced and that may produce cognitions as well. In order to *feel* regret one has to *think*. One has to think about one's choices and the outcomes generated by these choices, but one also has to think about what other outcomes might have been obtained by making a different choice. Thus, regret is typically felt in response to decisions that produce unfavorable outcomes compared to the outcomes that the rejected option would have produced. That is, we decide to do *X*, but in retrospect we discover that we would have preferred doing *Y* because we think or know that *Y* would have resulted in a better outcome. Because of this cognitive process of comparing outcomes to "what might have been" regret has been called a *counterfactual emotion* (Kahneman & Miller, 1986). Moreover, the more responsible we feel for an unfavorable outcome produced by our own action (or inaction) the more regret we experience (Burks, 1946; Zeelenberg *et al.*, 1998b). However, in spite of the fact that the prototypical regret experience involves a feeling of responsibility, some have argued that feelings of responsibility are not necessary for regret to occur (Connolly *et al.*, 1997; Landman, 1993).

Another important issue concerning regret is the question of how regret feels. It has been found that regret can be differentiated from several negative emotions on the basis of its phenomenology (Roseman *et al.*, 1994; Zeelenberg *et al.*, 1998c). The following characteristics were found to make up the phenomenology of regret: It is accompanied by feelings that one should have known better and by having a sinking feeling, by thoughts about the mistake one has made and the opportunities lost, by feeling a tendency to kick oneself and to correct one's mistake, and wanting to undo the event and to get a second chance.

A final issue concerning the experience of regret is its prevalence. Do we experience this emotion often, maybe even on a daily basis, or is it more of a rare experience, limited to very important decisions that turn out for the worse? The following will show that regret is experienced rather frequently, at least frequently enough to justify an inquiry into the rationality of regret. It has been argued that some of our decisions will always produce regret (cf. Humberstone, 1980). Betting on a horse race is an example of such a decision. Imagine placing a bet on a horse that loses. In such a situation you might regret wasting the money on the bet. However, if the horse wins, you may end up regretting not having placed more money on it. Thus, either way you end up with regret. This is, of course, not the case for all our choices. For some choices it is hard to imagine how they would result in regret. This is the case for Sorensen's (1998, p. 528) *regret puzzle*. Imagine the

following: “you are hereby offered a choice between \$1 and \$10. In addition, there is a bonus of \$100 if you regret your choice.” The point here is that regret is impossible when you know that the regret will be rewarded. Nevertheless, in real life regret is not likely to be rewarded.

There is also empirical evidence underscoring the claim that regret is frequently experienced. In a study of verbal expressions of emotions, Shimanoff (1984) found that regret was the second most frequently named emotion (only love was mentioned more frequently). Thus, what is important for the present purpose is that “regret is a common, if not universal, experience” (Landman, 1993, p. 110).

Taken together, regret is a frequently felt emotion, evoked when an obtained decision outcome compares unfavorably with an outcome that we could have obtained had we chosen differently, and typically occurs when we perceive ourselves to be responsible for this unforeseeable outcome. The experience of regret focuses attention on one’s own role in the occurrence of a regretted outcome. It motivates one to think about how this event could have happened and how one could change it, or how one could prevent its future occurrence.

Is the experience of regret rational?

The next question concerns the rationality of the experience of regret. Regret is an emotion that we experience from time to time. How can this be rational or irrational? Regret, and more generally emotions, are there because the tendency to feel emotions is inherent in being a human being. There is nothing we can do about it, and therefore one may say that the rationality question is not applicable (Elster, 1996). However, some have argued that we may learn to control the thoughts that produce the regret, and that because this would free us from the unpleasant experience, the experience itself is irrational (Bittner, 1992).

The view that emotions are irrational has been around for centuries. Based on early ideas of Plato and Aristotle, emotions were treated as dysfunctional and as distorting thought. This was also the opinion of Descartes (1647), whose reason for studying emotions was to gain better control of them. Even in this century people argued that “the shock of an emotional stimulus throws the organism for the moment at least into a chaotic state” (Watson, 1929, p. 216).

One reason why regret may be deemed irrational is because it can be viewed as a *sunk cost* (cf. Landman, 1993). A sunk cost is a cost made in the past. According to rational choice theory, only incremental costs and benefits should affect decisions about future events. Honoring sunk costs is considered to be irrational (see e.g. Arkes & Blumer, 1985). As Howard (1992, p. 38) puts it: “My preferences must be based on prospects—the futures I face. Regret is a bad thought that arises when I think about futures I might have received instead of the future I did receive.” But, what is of issue here, is not whether the regret is rational (i.e. the issue of rationality vs. irrationality does not apply to the experience of regret per se), but rather whether what we do with our regrets is rational [2]. Thus the rationality question should focus on whether it is rational to act on our emotions, and not on the emotions itself.

These emotions are a given factor. Let us first focus on *what* we do with our regrets, and then return to the issue concerning the rationality of these effects.

Regret influences behavior because it is anticipated and because it is experienced

Nowadays, emotions are viewed as an important part of human experience, and their influence on decision making is widely acknowledged in psychology and economics (e.g. Elster, 1998; Etzioni, 1988; Frank, 1988; Janis & Mann, 1977; Pieters & van Raaij, 1988). This also applies to regret. Recent research has shown that regret may influence our decisions because it is anticipated and because it is experienced.

There are several ways in which *anticipated regret* may influence our decisions. First, we may avoid deciding as a consequence of anticipated regret (cf. Beattie *et al.*, 1994). We can do this simply in order to avoid making the wrong decision. However, this inactive attitude may result in regret as well (Gilovich & Medvec, 1995). We may also avoid or delay our decisions because we want to gather more information in order to make a better decision, as was suggested by Janis and Mann (1977).

Another way in which anticipated regret may influence decisions is related to post-decisional feedback. Since regret stems from comparisons between outcomes of the chosen and non-chosen options, decision makers can try to avoid regret by avoiding feedback about non-chosen options. This tendency to avoid feedback regarding foregone outcomes can promote both risk-avoiding and risk-seeking tendencies. Which tendency prevails depends on whether the risk-seeking or risk-avoiding tendency avoids feedback on foregone outcomes. Zeelenberg *et al.* (1996) presented participants with a choice between two equally attractive gambles, one being relatively risky and the other being relatively safe. Next, feedback on one of the gambles was manipulated orthogonally to the riskiness of the gambles. In all three experiments we had a *Feedback Safer Gamble* condition, in which the safer gamble would always be resolved, and a *Feedback Riskier Gamble* condition, in which the riskier gamble would always be resolved. In addition to this feedback all participants always expected to learn the outcome of the chosen gamble. As predicted, the preponderance of participants in the Feedback Safer Gamble decided for the safer alternative, thereby protecting themselves from potentially threatening feedback on the foregone outcome. Similarly, Feedback Riskier Gamble opted more often for the risky course of action. Moreover, in one of the studies reported in Zeelenberg *et al.* (1996) the role of regret was confirmed when participants were asked for justifications of their choices. Participants in the two feedback conditions reported significantly more regret related justifications than participants in a control condition did, where no feedback would be provided.

There is ample research documenting the effects of anticipated regret on choice behavior. Results were found in the context of investment decisions (Zeelenberg & Beattie, 1997), negotiations (Larrick & Boles, 1995; Zeelenberg & Beattie, 1997), consumer choice in the context of both products and services (Inman & Zeelenberg,

1998), decisions to take advantage of a special sales promotion (Inman & McAlister, 1994; Simonson, 1992), self-protective health behaviors (Richard *et al.*, 1996a,b), litigation behaviors (Guthrie, 1999) and decisions to engage in unsafe driving behavior (Parker *et al.*, 1996). For example, Simonson (1992) asked consumers about the regret they would feel after having made a wrong decision, and found that this regret salience manipulation made them more likely to purchase an item that would shield them from this possible regret (i.e. a higher-priced, well-known brand), over a potentially better but more risky item (a less expensive, lesser-known brand). In a similar study, Richard *et al.* (1996a) showed that increasing the salience of possible regret after engaging in unsafe sex resulted in less risky sexual behavior in the five months following the study.

In addition to these well-documented effects of anticipated regret, there are a few studies that show that the *experience of regret* can also influence decision making. In an experiment conducted by Zeelenberg and Beattie (1997, Experiment 3) participants played the ultimatum game, a simple game in which two players, a proposer and a responder, have to agree on a division of a sum of money, say 100 Dutch guilders. The proposer offers a division to the responder (e.g. 20 guilders for you, 80 guilders for me), who may then choose to accept or reject the offer. If the offer is rejected neither player receives any money (for a review of ultimatum game research, see Camerer & Thaler, 1995). All players in the Zeelenberg and Beattie experiment were told that they were interacting with other players. In fact all of them were proposers, playing against a preprogrammed computer strategy. The procedure was as follows. Participants made their offer and subsequently learned that it was accepted. In addition, they also received feedback on how much less (2 guilders vs. 10 guilders) they could have offered and still have their offer accepted. The 10-guilders-too-much participants experienced more regret than the 2-guilders-too-much participants. When participants were asked to play a second round of the game (this time against another responder), those who had offered 10 guilders too much in the first round offered less money to the second responder than those who offered only 2 guilders too much in the first round. Statistical analyses indicated that these differences were attributable to the differences in experienced regret. Thus, their second offer appeared to be influenced by the regret experienced over the first offer.

In another study the behavioral consequences of regret were compared to those of disappointment (Zeelenberg & Pieters, 1999). This study examined consumers experiences with dissatisfying services that were caused by either regret or disappointment, and focused on the behavioral responses that were the result of these emotions. Disappointment and regret are related emotions. Both are related to decision making and both involve comparisons between an obtained decision outcome and one that might have been. But there are marked differences between regret and disappointment as well (for an excellent treatise of the psychology of disappointment, see van Dijk, 1999; see also [1]). Disappointment is felt when an outcome appears to be worse than expected, and one typically does not feel responsible for the obtained outcome. Consistent with these differences, the results of the Zeelenberg and Pieters study showed that regretful consumers, those who

realize that there is a better option, tend to switch to alternative service providers, and tend to refrain from sharing this experience with others. Disappointed consumers, those who had expected more from the service, however, engaged in more word-of-mouth. That is, they talked more to others about the bad experience. In sum, there is substantial research showing that anticipated regret influences decision making, and a growing number of studies showing effects for experienced regret as well.

Is it rational for our decisions to be influenced by anticipated regret?

As the research reviewed above shows, both anticipated and experienced regret may influence our decision making. The next question is whether it is rational for our behavioral decisions to be influenced by regret. I first focus only on the impact of anticipated regret, and will argue that the answer is not totally clear, but that under restricted conditions it might be rational. It is important to realize that the impact of regret may be considered rational because it can result in increased satisfaction of needs or increased well-being. It is beneficial when the anticipation of regret leads us to use condoms more often, to drink less alcohol, to use fewer soft drugs, to eat less junk food (Richard *et al.* 1996a,b), to drive in a less risky manner (Parker *et al.*, 1996), and forces us to think more carefully about our decisions (Beattie *et al.*, 1994; Janis & Mann, 1977).

Sometimes, however, it may be less rational to be influenced by anticipated regret since the satisfaction of needs may be adversely affected by this. Simonson (1992), for example, found that people are inclined to buy more expensive stereo equipment when anticipating regret. Larrick and Boles (1995) showed that anticipated regret in a negotiation task made participants into tougher negotiators which consequently made agreement less likely. What all these situations have in common, though, is that the decision maker is better protected against possible negative emotional consequences of the decision. This can also be seen as satisfying certain needs, although these needs are non-material. It may well be the case that individuals more or less “rationally” choose to take these non-material, psychological consequences into account. As Sarin has argued, “Psychological concerns such as anxiety, nervousness, regret and fear play an enormous role in decision making. These concerns, though unaccounted for in the economics of decision, are real to a person and should be incorporated in the analysis” (Sarin, 1992, p. 145); however, “the economic costs for avoiding psychological concerns should be pointed out to the decision maker” (p. 146). Following this reasoning, one may argue that rational behavior is behaving in such a way that is intended and perceived as wanted by the individual (cf. Aarts, 1996). The economists Loomes and Sugden (1982, pp. 809, 820) had a similar interpretation in mind when they developed regret theory [3]. They argued that

the individual who does experience elation and regret can be expected to try to anticipate those feelings and take them into account when making a decision under uncertainty ... [Moreover] if an individual does experience

such feelings, we cannot see how he can be deemed irrational for consistently taking those feelings into account.

In a later publication Sugden (1985) more explicitly defended the rationality of regret theory. He argued that in reality preferences are very often not complete or not easily retrieved, contrary to what is assumed in traditional theories of rational choice. In such situations a choice is difficult to make and difficult to evaluate. Hence, post-decisional regret can be perceived as an indication that the choice was wrong. This is especially true when the choice is hard to justify, which is typical for difficult choices. Thus, in order to justify their choices beforehand, people foresee a sort of self-recrimination and choose accordingly. In that way they are less often subject to regret. According to Sugden (1985), this is a rational thing to do when preferences are incomplete. Traditional rational choice theory cannot deal with incomplete preferences, and hence cannot explain several established phenomena, such as the Allais paradox (Allais, 1953). Regret theory, however, “describes some of the regularities in human behavior that occur because people sometimes don’t know how they should choose” (Sugden, 1985, p. 98). This implies that the anticipation of regret can only be considered irrational if it is irrational to have incomplete preferences. If one accepts incomplete preferences as a given, one should also accept that it might be rational to have one’s decision influenced by regret.

An even stronger claim for the rationality of the anticipation of regret can be found in Frisch and Jones (1993). In their approach, which is based on the ideas of the psychologist Daniel Kahneman (e.g. Kahneman, 1994; Kahneman & Snell, 1992; Kahneman *et al.*, 1997; see also Prelec & Loewenstein, 1998), the rationality of decisions should not be judged on the basis of correspondence with a formal model, but on the *accuracy* of the decision. A decision is accurate when there is a one-to-one correspondence between factors that influence the decision and factors that influence the experience.

In this approach a distinction is made between *decision utility*, the anticipated utility on which the choice is based, and *experience utility*, the utility based on the actual experience of the consequences of the decision. Frisch and Jones (1993) argue that traditional theories of rational choice assume that people are perfectly capable of predicting how future events and outcomes will be experienced, and that evaluations of choice options are based upon these predictions. It is therefore assumed that there is no difference between decision and experience utility. According to Kahneman and Tversky (1984), however: “Some factors that affect experience are not easily anticipated, and some factors that affect decisions do not have a comparable impact on the experience of outcomes” (p. 349). In Frisch and Jones’ approach a decision is accurate, and therefore rational, if decision utility and experience utility correspond. This is not different from traditional approaches. The difference lies in the fact that in Frisch and Jones’ approach experience utility can also be influenced by more subjective characteristics of an outcome. In the traditional approaches utility was always related to objective characteristics. Different presentations of the same outcome were thought to result in the same utilities. In

other words, framing effects in decision making were thought to be irrational. Research from Levin and Gaeth (1988) shows, however, that experience utility can depend on framing. These researchers asked their participants to indicate how they evaluated ground beef. Although all participants ate the same beef, half of them were told that the beef was 25% fat, and the other half were told that the beef was 75% lean. The “75% lean” participants found the beef to be less fatty and of better quality, which suggests that the framing of information affects the experience of the outcomes. If we consider experience utility, not decision utility, it seems quite rational to allow for decisions to be influenced by framing as well (cf. Frisch & Jones, 1993).

Following this line of reasoning, it is also rational to anticipate regret as long as we can experience it as a consequence of the decision. As described earlier in this article, research on the effects of anticipated regret shows that decision makers are likely to take future regrets into account when they expect to learn about the outcomes of foregone alternatives. This feedback is the primary determinant of the experience of regret. Thus, only in situations where people expect future regrets to be present (when they can compare “what is” to “what might have been”) do they take regret into account when making a decision. Thus, in Frisch and Jones’ (1993) approach, these decision makers seem to be rational (or better, more accurate) because only when their experience utility is likely to be influenced by regret do they allow their decision utility to be influenced by regret.

Another issue of importance is whether individuals are capable of predicting their future regrets. Although we have seen that people take regret into account when they know they will experience it, it is still crucial that they make correct predictions of the intensity of their possible future regret. The prediction of future emotions has not been studied extensively. There are a few studies suggesting that we may not always be that precise when it comes to predicting our future feelings and emotions (e.g. Loewenstein & Schkade, 1999). In studies focusing on our general capacities to predict future emotional states, it has been found that we may sometimes overestimate the duration of our future emotions and also overestimate the intensity of emotional reactions to events (Gilbert *et al.*, 1998). These tendencies may cause inaccurate predictions of experience utility, and thus lead to irrational (i.e. inaccurate) choices. However, it remains unclear whether these faulty predictions also apply to regret. In two studies on regret in a decision making context, it was found that the predicted regret and experienced regret corresponded quite well (Mellers *et al.*, 1999; Pfister *et al.*, 1998). It is clear that more research is needed before we can conclude whether we are good predictors of our future regrets.

Unfortunately, there is another issue that makes things even more complicated. There are cases in which it could be argued that it would be irrational to take our feelings of regret into account even if we were to accurately predict these regrets. For example, when we make decisions on behalf of others, they are the ones who will experience the consequences. We, however, make the choice and therefore we may experience the possible regret. Hershey and Baron (1987) argue that in such cases our own regrets ought to be ignored. What we can do in these cases is focusing on the feelings that the people affected by our decision would experience [4]. It is,

however, not yet clear if, and how, the approach of Frisch and Jones (1993) could incorporate the feelings of the people affected. Most of the time such decisions should indeed be based on the wishes, feelings and beliefs of the affected people, but there are cases in which it can be argued that the decision maker should ignore them (see Lichtenstein *et al.*, 1990, for a discussion of cases in which societal decision makers should disregard the desires of the people affected).

Taken together, there are reasons for arguing that it is *not* irrational to be influenced by the anticipation of regret. Though, this only applies to choices that we make for ourselves, and in which we are accurate in predicting *when* regret may be a consequence of our decisions (e.g. when we expect to learn the outcome of rejected options) and in which we are accurate in predicting the *intensity* of this possible regret.

Is it rational for our decisions to be influenced by experienced regret?

So far I have only focused on the rationality of taking anticipated regret into account. However, as we have seen earlier in this article, experienced regret may also exert its impact on decisions. What can we say about the rationality of these effects? Here the earlier quotation of Howard (1992) is relevant. If one sees retrospective regret as a sunk cost, one should argue that it is irrational to be influenced by the experience of regret. I would like to maintain that, in spite of its irrationality, the effects of the experience of regret can be very functional.

Experienced regret, since it makes the mistakes more painful, may help us to learn from our mistakes. As Shefrin and Statman stated, “both the unpleasant pain of regret and the pleasurable glow of pride can lead to learning. They help us to remember clearly both bad and good choices” (1986, p. 57). A similar argument is presented by Farnsworth (1998, p. 19) in his recent book on regretted decisions in the context of contract law. He writes, “If you sometimes had ‘past Regrets’ because of unexpected difficulties in performing, you could allay your ‘future Fears’ by including in your agreement a force majeure clause, excusing you from performing should such difficulties arise.” Taylor (unpublished research described in detail in Miller & Taylor, 1995) demonstrated this effect of regret on memory in a controlled setting. In one of his studies Taylor had participants play a game in which they acted as managers of a trucking company that had to deliver weekly orders to another company on an island nearby. The island could be reached by a bridge or a tunnel, both of which were heavily traveled. It was the participants’ task to decide whether to take the tunnel or the bridge on a series of trips. A delayed delivery resulted in extra costs. The study was set up so that the participants were on time on half of the trials, and late on the other half (irrespective of the route they picked). In one condition regret was induced by informing the participants on the delay trials that they would have been on time had they chosen the other route. In the other condition regret was prevented by informing them that the other route also suffered from delays. When later, after two filler tasks, they were asked to estimate the frequency of delays, the regret delays (those where taking the other road would have been better) were overestimated, and the non-regret delays were underestimated.

Additional measures indicated that the regret delays were more frustrating, and that the more participants indicated that they found these delays frustrating, the more likely they were to overestimate their occurrence. Thus, mistakes that could have been avoided result in regret, and because of this regret we are more likely to remember them. Although it is painful to remember regretful mistakes, it is functional to do so when it helps us to prevent the same mistakes in the future.

Another way in which the experience of regret may be functional is when it motivates us to undo the cause of the regret. This undoing can be real behavior, for example, after buying a product which proves to be sub-optimal, regret can motivate us to ask for our money back, or it may result in apologies in the case of interpersonal regrets (Golding, 1984; Zeelenberg *et al.*, 1998a). In both instances regret can help us to satisfy our needs in the best possible way. It protects us from wasting money and helps us to maintain good social relationships. Interestingly, regret may also be functional via its influence on cognitions. Instead of going back to the shop, we can imagine various ways in which the outcome could have been more favorable to us. So regret not only helps us to remember our mistakes and missed opportunities and motivates us to engage in reparative action; by means of mental undoing it also prepares us to behave more appropriately when we are confronted with similar choices in the future. These are only a few examples of how the effects of retrospective regret may be functional (for a detailed discussion of several other functions of regret see Chapter 1 of Landman, 1993).

However, the impact of retrospective regret will not always be functional. Remember that regret stems from a comparison between what is and what might have been had one chosen differently. But, what exactly might have been is always in the eye of the beholder, and thus one may sometimes be incorrect. This is especially true since these judgments of what might have been are made in hindsight. This may result in unnecessary regret and costly changes in behavior (cf. Sherman & McConnell, 1995). Consider the following example adopted from Gerritsen (1998, p. 137). Imagine going to the racetrack with your expert friend. She advises you to bet \$10 on a particular horse with the odds of 50–1. Because there is a high risk of losing your money, you decline the bet, only to find out later that the horse has indeed won. You deeply regret not having followed your friend's advise, for then you would have had \$500 instead of \$10. If you interpret this regret as a signal that you should have chose differently, you may decide to follow your friend's advise in the future when it comes to betting. This may be functional in the sense that following her advise provides you with a higher expected value then you would have gotten had you chosen your own bets (because of her expertise). However, it can also be dysfunctional since it may prompt you to bet more often then you would normally and hence lose money in the long run.

It thus seems that the functionality of the influence of regret on subsequent behavior is very much dependent on whether the behavior to which one is switching is "better" than the initially chosen behavior. The example also suggests that the functionality of regret is dependent on whether the regretted option was really a "bad" decision. However, I argue that this is not necessarily the case. Regrets that may not be appropriate can still be functional. What I consider to be decisive is

whether the impact on future behavior is beneficial. Thus, one may even consider regret functional when it stems from comparisons with outcomes of behavioral alternatives that were *not* feasible at the time the original decision was made. For example, one may regret not having bought a house when the prices were low, because one would have made a huge profit now that house prices have doubled in a few years. One may even feel this regret in spite of the fact that one did not have the money to buy a house in the first place. Still this regret may be functional, since it may help you to take advantage of such opportunities when they manifest themselves in the future.

Following this line of reasoning, regrets may also be dysfunctional even though they are appropriate in the sense that they stem from comparisons with another behavioral alternative that was feasible at the time the original decision was made. This would be the case when the original behavior cannot be undone. For example, consider someone whose parents die in a car accident. This person may feel intense regret about not having resolved their last conflict and not having told his parents often enough how much he loved them. Although these regrets are very understandable, they can be considered dysfunctional since they only make him feel bad, while there is no way for him to undo his regretted inaction. Thus, in order for regret to be functional we need to be able to determine the difference between functional and dysfunctional regrets, and this difference lies in the future benefits that stem from the effects of regret on behavior. Therefore we need to be able to predict the effects of altering our behaviors in order to know when regrets are functional or dysfunctional. It is not yet clear whether we are able to do so.

Summarizing

Both anticipated and experienced regret do influence the choices people make. The influence of anticipated regret can be considered rational when people are accurate in predicting their future regret. The influence of experienced regret cannot be considered rational, but it can sometimes be functional. That is, because experienced regret helps us to remember “wrong” decisions and motivate us to undo these decisions, it may help us to adapt to similar situations in the future. Future theorizing about on the rationality and functionality of regret should incorporate the notion that regret can be a rational and functional emotion. Future research may want to focus on finding the conditions under which we are able to correctly predict our future regret in order to establish when it is rational to anticipate those. Future research may also want to investigate whether we are able to ignore the experience of regret when the implications would not be functional.

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Notes

- [1] The other emotion that is relevant to these choice situations is that of disappointment. It is important to note that there are important differences between regret and disappointment (e.g. van Dijk, 1999; Zeelenberg *et al.*, 1998d). One of the differences is that regret is always experienced in the context of choice, that is, in situations in which one could have done something differently that would have resulted in a better outcome. Disappointment, in contrast, may also be experienced in contexts where no choice was involved, for example, when one is given a birthday gift that one does not like. This is the case because disappointment stems from differences between expectations and outcomes, whereas regret stems from comparisons between outcomes and forgone outcomes that would have been obtained had a different choice been made. This choice dependency of regret makes it a more interesting emotion in relation to rational *choice* theories. Hence, the present article is limited to the impact of regret.
- [2] It needs to be noted that a number of current theorists have plead in favor of the rationality of emotions (e.g. Damasio, 1994; de Sousa, 1987; Frank, 1988). However, these efforts did not address the rationality of emotions *per se*, but only the rationality of the impact of these emotions on our behavior.
- [3] Earlier researchers had already argued that it may be rational to base your decisions on anticipated regret. For example, it has been argued that the “*minimax regret*” principle, discussed earlier, is a rational principle for decisions under ignorance (i.e. when there is no information whatsoever about the probabilities with which the outcomes are to occur). However, when information about these probabilities is present, the minimax regret principle is sub-optimal. In such cases a very unprobable negative outcome may have too big an influence on the decision to be made. Such an outcome can make an option very unattractive, because the possible regret associated with that option is very big, even though the occurrence of the regret is highly unprobable. Regret theory, because it does take probabilities into account, also applies to decisions under risk or uncertainty.
- [4] It is doubtful whether we would be accurate in predicting other people’s emotions, especially since we are not even that good in predicting the preferences of our spouses (Davis *et al.*, 1986).

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