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Attributions of responsibility and affective reactions to decision outcomes

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Abstract

Immediate affective reactions to outcomes are more intense following decisions to act than following decisions not to act. This finding holds for both positive and negative outcomes. We relate this “actor-effect” to attribution theory and argue that decision makers are seen as more responsible for outcomes when these are the result of a decision to act as compared to a decision not to act. Experiment 1 ($N = 80$) tests the main assumption underlying our reasoning and shows that affective reactions to decision outcomes are indeed more intense when the decision maker is seen as more responsible. Experiment 2 ($N = 40$) tests whether the actor effect can be predicted on the basis of differential attributions following action and inaction. Participants read vignettes in which active and passive actors obtained a positive or negative outcome. Action resulted in more intense affect than inaction, and positive outcomes resulted in more intense affect than negative outcomes. Experiment 2 further shows that responsibility attributions and affective reactions to outcomes are highly correlated; that is, more extreme affective reactions are associated with more internal attributions. We discuss the implications for research on post-decisional reactions. © 2000 Elsevier Science B.V. All rights reserved.

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1. Introduction

The extent to which we feel good or bad when confronted with the outcome of a decision does not solely depend upon the outcome of that decision. Affective reactions also depend on *how* the outcome is achieved. Outcomes achieved through action generally lead to more intense affective reactions than the same outcomes achieved through inaction (Baron & Ritov, 1994; Connolly, Ordóñez & Coughlan, 1997; Ritov & Baron, 1995; Gleicher et al., 1990; Kahneman & Tversky, 1982a; Landman, 1987; Zeelenberg, van Dijk & Manstead, 1998a). Landman coined the term *the actor-effect*¹ for this phenomenon. In the present paper, we investigate a possible antecedent of this effect.

Insight in factors that influence post-decisional affect is valuable knowledge. As suggested by regret and disappointment theories (Bell, 1982, 1985; Loomes & Sugden, 1982, 1986), recent integrations of these theories (Inman, Dyer & Jia, 1997; Mellers, Schwartz & Ritov, 1999; Zeelenberg, van Dijk, Manstead & van der Pligt, 2000b), and shown by empirical research, people anticipate post-decisional feelings, and take them into account when making decisions (see for reviews, van der Pligt, Zeelenberg, van Dijk, de Vries & Richard, 1998; Zeelenberg, 1999). Understanding of the determinants of post-decisional affect will further our understanding of the role of affect in decision making.

2. Action vs. inaction

The actor-effect is best demonstrated by Kahneman and Tversky's vignette (1982a, p. 142), to which a large majority responded that Mr. George (action) would feel most regret, even though his consequences were identical to Mr. Paul's (inaction) in every respect.

Mr. Paul owns shares in company A. During the past year he considered switching to stock in company B, but he decided against it. He now finds out that he would have been better off by \$1200 if he had switched to the stock of company B. Mr. George owned shares in company B. During the past year he switched to stock in company A. He now finds out that he would have been better off by \$1200 if he had kept his stock in company B. Who feels more regret?

Landman (1987) suggests that this actor-effect could be related to attributional processes. Attribution theory deals with how people perceive the causes of their own and others' behavior. Research in this field shows that affective reactions following success and failure are largely determined by attributions (McFarland & Ross, 1982). Weiner (1982, 1986) argued that affective reactions are stronger when an outcome can

¹ The difference in affective reactions following action and inaction has also been referred to as omission bias (e.g., Baron & Ritov, 1994; Kordes-de Vaal, 1996; Ritov & Baron, 1990, 1995; Spranca, Minsk, & Baron, 1991). We chose to use the term actor effect because it only refers to affective differences, whereas omission bias also refers to action–inaction differences in morality, intention, and choice.

be attributed to the actor as opposed to situational factors. It has also been shown that actions, compared to inactions, are more salient, are more often used to infer one's own and others' attitudes, and are perceived to be more informative (Fazio, Sherman & Herr, 1982). Other research shows that people who cause harm by acting are judged to be more personally responsible and immoral than those causing the same harm by not acting (Ritov & Baron, 1990; Spranca et al., 1991). Taken together, this may imply that the causal relation between a decision maker and an obtained outcome will be stronger for actions than for inactions, due to the salience of the decision maker as a causal agent in the case of action. Outcomes following inaction, however, may be attributed to any preceding external event. This may go some way in explaining why actions lead to more intense affective reactions than inaction.

Supporting evidence for the relation between attributions and affect can also be found in a recent discussion between Connolly et al. (1997), Ordóñez and Connolly (2000), and Zeelenberg et al. (1998a, 2000a). These authors manipulated responsibility by presenting participants with vignettes in which actors arrive at a negative outcome either as a result of their own choice, or as a result of a computer assignment over which they had no control. This manipulation influenced the intensity of the regret reported for the actors. This discussion, however, because of its focus on one specific affective reaction, remains mute as to whether more general affective reactions to decision outcomes are also influenced by decision responsibility. In our Experiment 1 we will test the basic assumption underlying our reasoning, namely that outcomes for which one feels more responsible result in more intense affect than those for which one does not feel responsible. Next, in Experiment 2 we will apply this reasoning to the actor-effect.

Summarizing, the attribution theory explanation of the actor-effect builds on the relation between attributions of responsibility and affect, and holds that actions lead to more personal (vs. situational or external) attributions than inactions, and these in turn lead to more intense affective reactions for actions than for inactions.

3. Positive vs. negative decision outcomes

Most research on affective responses to outcomes of decisions focuses on vignettes with negative outcomes (Gilovich & Medvec, 1995; Kahneman & Tversky 1982a; Kordes-de Vaal, 1996; Wells & Gavanski, 1989). The studies by Landman (1987), Gleicher et al. (1990) and Baron and Ritov (1994), however, focus on affective reactions to both positive and negative outcomes following action or inaction, and all obtained an actor-effect for both positive and negative outcomes. However, in Landman's study it seemed as if the actor effect was more pronounced for the latter.²

² Research by Gleicher et al. (1990) showed that this stronger actor effect for negative outcomes only occurred when the outcome of the unchosen alternative was unknown (i.e., when there was partial resolution). In cases of complete resolution, where the alternative outcome was also known, the actor effect was equally strong for positive and negative outcomes. Baron and Ritov (1994) also found that the actor effect was equally strong following positive and negative outcomes in cases of complete resolution. In the present research all the vignettes provided the participants with complete resolution.

This let her to conclude that: “The emotional response attributed to unhappy decisions is more intense than the emotional response attributed to otherwise equivalent happy decisions” (Landman, 1987, p. 532). This conclusion is consistent with the well-known prospect theory finding that “losses loom larger than gains” (Kahneman & Tversky, 1979). However, it does not appear to be supported by Landman’s data. The point is that she could not test whether the *levels* of regret following a negative outcome are higher than the levels of elation following a positive outcome, since the *intensity* of the affective reactions was not directly assessed. Landman used Kahneman and Tversky’s (1982a) paradigm, in which participants read a vignette and answered the question, “who feels worse (or better, in case of positive outcomes), about the outcome, the person who acted, or the person who did not act?” The fact that the actor-effect was more pronounced for negative outcomes than for positive outcomes does not imply that affective reactions following a negative outcome are more intense than those following a positive outcome. It only shows that these affective reactions following action vs. inaction are more *differentiated* in the case of negative outcomes as compared to positive outcomes. Thus, when interested in the intensity of affective reactions to decision outcomes, it is important to assess this intensity directly. That is what we did in Experiment 2.

Contrary to Landman’s interpretation, however, other research has found that the ratings of emotional intensity were higher following positive than following similar negative outcomes. Van Dijk and van der Pligt (1997), for example, found that elation following winning a prize was more intense than disappointment following missing it. Baron and Ritov (1994, Experiment 2) assessed emotion ratings following action and inaction on a scale ranging from –100 (bad) to +100 (good). Their results indicate that positive outcomes in the domain of gains lead to more extreme affect (+62.50) than following negative outcomes in the domain of losses (–26.75). Interestingly, even positive outcomes in the domain of losses seem to produce more extreme affect (+42.25) than negative outcomes in the domain of losses.³ Thus, on the basis of these findings it is not clear whether “losses loom larger than gains” also applies to affective reactions to decision outcomes.

In our Experiment 2 we also asked for intensity ratings. We not only predicted that affective reactions would be more intense following action than following inaction, but also that affective reactions would be more intense following positive outcomes than following negative outcomes. This last prediction was based both on the findings referred to above, and on a finding from attribution theory that may account for these differences, namely the *positivity bias* (e.g., Feather & Simon, 1971). The positivity bias refers to the tendency to attribute behavior with positive consequences more to internal factors and behavior with negative consequences more to external factors. van der Pligt and Eiser (1983) show that this tendency exists regardless of the attributors role; both actors and observers exhibit the

³ These numbers were obtained by averaging the emotion ratings of the following conditions presented in Baron and Ritov (1994, p. 486): gain-better (+62.50) and loss-worse (–26.75), and loss-better (+42.25).

positivity bias. Before studying the role of attributions in the actor effect, however, we provide a more basic test of our attribution explanation of affective reactions to outcomes.

4. Experiment 1

This experiment tested whether increased responsibility for outcomes indeed results in more extreme affective reactions. We had students at Tilburg University ($N = 80$) read the following vignette in which two actors arrive at the same bad outcome, one of the actors arrived at the outcome through a deliberate decision, the other was assigned to it. This decision agency manipulation is modeled after one that has been effectively used in research on the effects of responsibility on regret (Connolly et al., 1997; Ordóñez & Connolly, 2000; Zeelenberg et al., 1998a, 2000a). It is important to note that this decision agency manipulation is different from action–inaction manipulations in which the inactive person makes a deliberate decision not to take any action. In the present experiment the “inactive” person is assigned to the bad outcome and thus does not make any decision at all. The vignette read as follows:

Robert and Jerome are both employees of a big company, located in the center of Netherlands. They do not know each other. The company exists for 50 years and decides to celebrate this. Part of this celebration is a day-trip with other employees of the company. They can choose between two different destination, the *Efteling* (an outdoor amusement park near Tilburg) and *Metropolis* (a science museum in Amsterdam). Not all employees were aware of their opportunity to choose. Robert was and after some deliberation he decided for the *Efteling*. Jerome, who was not aware of the opportunity to choose, is allocated to the group who visited the *Efteling*. On the day of the trip it is filthy weather. It rains all day and is quite stormy. The group that goes to the *Efteling* suffered from the weather, whereas the group going to *Metropolis* spent a warm and dry day in an attractive museum. To make things worse, the restaurant in Tilburg appeared to be mediocre, whereas the restaurant in Amsterdam was excellent. In short, the trip to the *Efteling* was not terribly successful.

Who feels worse, Robert or Jerome?

As predicted, a significant majority of participants (64%) indicated that Robert, who selected the amusement park, felt worse than Jerome, who was assigned to the same group, $\chi^2(1) = 6.05$, $P < 0.05$. This shows that a negative outcome is believed to produce more intense post-decisional affect when a person him or herself is responsible for that outcome. These results thus support the main thesis of the present article that affective reactions to decision outcomes are partly driven by the attributions of these outcomes. In Experiment 2, we studied general affective responses to negative and positive outcomes following action and inaction.

5. Experiment 2

In Experiment 2, we studied the role of attributions in the context of the actor-effect. We related the actor-effect to differences in perceived responsibility for the outcome after action or inaction. We also included measures of mental simulation since the actor effect is often explained in these terms (Kahneman & Tversky, 1982a). More specifically, it is often argued that actions result in more affect since it is easier to mentally mutate actions into inactions than the reverse. Although there is ample research supporting the claim that these mental mutations, or “counterfactual thoughts,” influence post-decisional affective reactions (Kahneman & Miller, 1986; Roese, 1997; Zeelenberg et al., 1998b), to our knowledge only one study tested whether these mutations are an important determinant of the actor-effect (N’gbala & Branscombe, 1997). The results of this study do not support the mutability explanation of the actor-effect. In a direct test of whether actions are more mutable than inactions, N’gbala and Branscombe found no differences. Moreover, they also did not find a relation between these mental simulations and post-decisional affective reactions.

However, the measure of mutability in N’gbala and Branscombe (1997) may not have captured the essentials of the explanation of the actor effect in terms of mental simulations, namely the *ease* with which an outcome can be mutated. As Kahneman and Tversky (1982b, p. 202) stated, mental simulations have “implications for emotions that arise when reality is compared with a favored alternative, which one had failed to reach but could easily imagine reaching”. However, N’gbala and Branscombe presented participants with Kahneman and Tversky’s (1982a) stock-broker vignette and asked them “to imagine how the outcome might have been different by completing an “If only . . .” stem (i.e., the mutation task)” (N’gbala and Branscombe, 1997, p. 331), and found that action and inaction were mutated equally often. In the present experiment we will ask for ease of mental simulation directly, and test whether this is related to the actor-effect.

Participants in the present study were presented with a series of vignettes (mostly based on Landman, 1987) in which active and passive actors reach the same positive or negative outcome. In addition to measuring affective reactions, attributions and ease of mental simulation were assessed, in order to gain insight in the relative impact of both processes.

5.1. Method

5.1.1. Design and participants

We used a 2 (Decision: Action vs. Inaction) × 2 (Outcome: Positive vs. Negative) × 6 (Vignettes) fully within-subjects design. To control for order effects, we presented the vignettes in eight different orders. Students at the University of Amsterdam ($N = 40$) participated in the experiment in order to earn course credits.

5.1.2. Procedure and material

Booklets containing two questionnaires and a filler task were randomly distributed among participants. In the first questionnaire, participants were con-

fronted with six vignettes. Completing this questionnaire took approximately 10 min. The next task was an unrelated filler task that took approximately 20 min. The second questionnaire consisted of the same six vignettes, but this time with opposite outcomes (negative in the second questionnaire when it was positive in the first questionnaire, and the reverse). Thus, participants were presented with each vignette twice; once with a positive outcome and once with a negative outcome.

The vignettes presented in this study concerned:

1. winning or losing money on the stock market after deciding to trade shares or deciding against it;
2. winning vs. losing a soccer match after having changed the team halfway through the game vs. having decided not to change the team;
3. getting a substantive promotion vs. losing one's job after moving to a new job vs. after choosing to remaining in one's original job;
4. receiving a high vs. a low grade in a course after having taking deliberate action to be reassigned to a particular section vs. deliberately deciding to stay in a section originally assigned to;
5. winning vs. missing the grand prize in a lottery after choosing to pick or receive a lottery ticket; and
6. having a splendid vs. awful skiing holiday after selecting a new location vs. deciding to stick to one's favorite holiday destination.

All these vignettes provided the participants with complete resolution as to what would have happened had the actors chosen otherwise.

After reading each vignette, participants were asked to attribute responsibility to the two actors. They did this by indicating on 11-point scales whom they thought was more personally responsible for the outcome, and who had contributed more to it. The scales ranged from -5 (name of the passive actor) to $+5$ (name of the active actor). For further analyses, variables were averaged and they formed the variable *attribution* (Cronbach's $\alpha = 0.62$). Higher scores indicate more internal attributions for the active actor. The ease of mental simulation of other possible outcomes was also measured by two 11-point scales. Participants indicated whether it was easier to imagine a better outcome for the active actor (-5) or the passive actor ($+5$), and whether it was easier to imagine a worse outcome for the active actor (-5) or the passive actor ($+5$). After reversed coding of the second question, these variables were averaged and they formed the variable *ease of simulation* (Cronbach's $\alpha = 0.86$). Higher scores indicate that it was easier to imagine that the active actor could have had a better outcome. Finally, on two 11-point scales, with endpoints labeled *bad* (-5) and *good* ($+5$), participants indicated how they thought that the active actor and the passive actor would feel.

5.2. Results

5.2.1. Affective reactions

The mean affective reactions for each vignette are depicted in Table 1. These were, as predicted, more intense following action than following inaction, except the

Table 1
Mean affective reactions for each vignette in Experiment 2 (mean attribution score in parenthesis)^a

Outcome		Positive			Negative		
		Action	Inaction	(Attribution)	Action	Inaction	(Attribution)
<i>Vignette</i>							
1	Investment	3.70	2.95	(0.65)	-3.25	-2.45	(0.48)
2	Soccer	3.47	3.15	(0.98)	-1.53	-1.05	(0.50)
3	Career	3.48	2.83	(0.72)	-3.63	-3.18	(0.54)
4	Course	3.42	2.78	(1.12)	-2.20	-2.40	(-0.08)
5	Lottery	4.05	3.60	(1.29)	-1.63	-1.22	(0.75)
6	Vacation	3.52	2.98	(0.95)	-2.52	-1.92	(0.17)
	Average	3.60	3.03	(0.95)	-2.46	-2.03	(0.39)

^a Note: Affective reactions could range from -5 (bad) to +5 (good) (attributions could range from -5 (passive actor) to +5 (active actor)).

course vignette with the negative outcome. To examine affective intensity, the absolute value of the affective reactions were analyzed in a 2 (Decision: Action vs. Inaction) \times 2 (Outcome: Positive vs. Negative) \times 6 (Vignettes) within-subjects MANOVA. The actor-effect was present in all six vignettes (all univariate P 's $<$ 0.05) as reflected by the significant main effect of Decision, $F(6, 34) = 10.35$, $P <$ 0.001. Results also showed the predicted main effect of Outcome, $F(6, 34) = 9.80$, $P <$ 0.001; affective reactions following positive outcomes were more intense than affective reactions following negative outcomes. There was a marginally significant Decision \times Outcome interaction, reflecting a difference in affective reactions following action and inaction for positive and negative outcomes, $F(6, 34) = 2.70$, $P <$ 0.09. Univariate analyses showed that this interaction was only significant in the course vignette, $F(1, 39) = 10.93$, $P <$ 0.002. This interaction was absent in the remaining vignettes (all F 's $<$ 1.4), indicating that the size of the actor-effect did not differ between positive and negative outcomes (except for the course vignette).

5.2.2. *Attributions and simulations*

If affective reactions are related to the extent to which the outcome is attributed to the actor, differences in attributions following action vs. inaction should be predictive of the difference in affective reactions following action vs. inaction. We examined this possibility by conducting multiple regression analyses separately for each vignette. The variable to be predicted was the size of the actor-effect (i.e., the difference between affective reactions for the active actor and the passive actor). The predictors in these regression analyses were *attribution* and *ease of simulation*. The beta-weights and multiple correlations for each regression analysis are shown in Table 2. Attribution was a significant predictor of the difference in affective reactions in seven of the 12 regression analyses. Only in one analysis, ease of mental simulation

Table 2
Beta-weights and multiple correlations for positive and negative vignettes (Experiment 2)

		Predictors		R
		Attribution	Ease of simulation	
<i>Vignette</i>				
<i>Outcome positive</i>				
1	Investment	0.48**	0.19	0.47
2	Soccer	0.73**	-0.22	0.68
3	Career	0.11	0.05	0.14
4	Course	0.29	0.20	0.41
5	Lottery	0.16	-0.05	0.14
6	Vacation	0.39*	0.15	0.45
<i>Outcome negative</i>				
1	Investment	0.52**	-0.19	0.60
2	Soccer	0.50**	0.01	0.50
3	Career	0.20	-0.07	0.22
4	Course	0.54**	-0.28*	0.63
5	Lottery	0.49**	-0.10	0.51
6	Vacation	0.12	-0.12	0.20
	Overall	0.61**	-0.01	0.61

* Beta-weight = $P < 0.05$.

** Beta-weight = $P < 0.005$.

contributed significantly to the prediction. It needs to be noted that this effect is in the direction opposite to what was expected. The easier it was to imagine, a better outcome for the active actor in the course vignette with a negative outcome, the stronger the affective reaction for the inactive actor. For the attribution measure, the effect was always in the predicted direction; the more the active actor was held responsible for the outcome, the stronger his affective reaction.

5.3. Discussion

Results of this experiment replicate the principal finding of earlier experiments on the actor-effect, namely emotional amplification following action. The finding of Baron and Ritov (1994) and van Dijk and van der Pligt (1997) that positive outcomes resulted in more intense affect than negative outcomes was also replicated. These findings underline the importance of attributions as a determinant of affective reactions. We also hypothesized that the actor-effect would be related to differences in the perceived responsibility for the obtained outcome for the active vs. the passive actor. Results of this experiment clearly support this idea, and are in accordance with earlier research demonstrating the causal link between attributions and affective reactions (Fazio et al., 1982; Weiner, 1986).

6. General discussion

The findings reported here support the notion that general affective reactions following decision outcomes are partly based on attributional processes. In Experiment 1, participants read a vignette in which responsibility for decision outcomes was directly manipulated. Two actors arrived at an identical outcome, one through a deliberate decision, the other through an assignment. The more responsible actor was judged as feeling worse.

In Experiment 2, participants were confronted with vignettes in which active and passive target persons arrive at identical outcomes. The active persons arrived at the outcome through decisions to act, and the passive persons through decisions not to act. Participants indicated how bad or good each target person would feel. This enabled us to compare the size of the actor-effect for positive and negative outcomes, and the intensity of affective reactions following positive and negative outcomes. Affective reactions were more intense following action than following inaction, and more intense following positive than following negative outcomes. Moreover, these data show a clear relationship between general post-decisional affect and attributions, with more internal, personal attributions associated with more intense affect.

Before addressing the implications of these results, let us point out three possible shortcomings of the present research.⁴ First, our finding that positive outcomes produce more intense affect than negative outcomes could only be read as a general statement if the positive and negative outcomes have the same magnitude and the same a priori likelihood. This was probably not the case in all the vignettes we used. For example, one could argue that just missing a prize in the lottery vignette is of lesser magnitude than winning a prize. However, the positive and negative outcomes in some vignettes appear to be roughly equal in magnitude (e.g., winning vs. losing them same amount on the stock). Future research, keeping constant the magnitude and likelihood of the positive and negative outcomes, could resolve this issue.

Second, a problem that can be present in action/inaction research is that the manipulation of action vs. inaction can be confounded with a manipulation of decision vs. no decision, such that the person who acts not only differs from the passive person because of the act, but also because only the active person made a decision. We have tried to overcome this by making clear that the inactive persons in Experiment 2 did actively consider both action and inaction, but eventually choose for inaction. In Experiment 1, we manipulated deciding vs. not deciding. We found that both manipulations, action vs. inaction and deciding vs. not deciding, influence the affective reactions to the obtained outcomes, but we do not know whether these factors interact. Previous research has suggested that inactions might well be perceived as non-decisions (Kordes-de Vaal, 1996). For a complete understanding of these effects it would therefore be necessary to study how both factors, manipulated orthogonally within one experiment, influence attributions and affective reactions.

⁴ We thank Karl Teigen and an anonymous reviewer for pointing these out to us.

A third possible shortcoming of our research is our measure of mutability in Experiment 2. We tried to overcome the problems related to N'gbala and Branscombe's (1997) measure, by directly assessing the mutability of outcomes (whether it was easier to imagine a better or worse outcome for the passive and active actor). Nevertheless, it may well be that mutability of causes (whether it was easier to imagine a different decision by the passive and active actor, which would have led to a better or worse outcome) would have been a better measure. Although, the first measure is more inclusive, since it also includes mutations of the outcome produced by different behaviors of the actor (as measured by mutability of causes) and by all other factors, it might have been the case that participants understood it as undoing the outcomes without changing the actor's behavior. Future research should either focus on mutability of causes, or provide participants with more explicit instruction about mutability of outcomes.

Another issue related to the effect of mutability and affective reactions is the following: Although we presented attribution theory and mental simulations as separate explanations for the actor-effect in Experiment 2, it could also be argued that the two explanations are complementary, in such that mental simulations may influence attributions which in turn influence affective reactions. As Roesse and Olson (1996, p. 201) argue, "counterfactual conditions are essentially causal statements." Research by Wells and Gavanski (1989) shows that people use mental simulations in assessing the causal role of events (see also Lipe, 1991). In their first experiment, Wells and Gavanski asked participants to read a vignette in which a woman dies from an allergic reaction to a dish ordered by her boss. They described the boss as having considered the ordered dish and another dish. When the other dish did not contain the allergic ingredient the boss' role in the woman's tragic death was judged as more causal than when the other dish also contained the allergic ingredient. It appears that people attribute outcomes to those factors that are imagined to covary with those outcomes. Thus mental simulations about how an outcome was achieved can influence the attributions that people make. This should then influence the affective reaction to the outcome. Supporting evidence for this reasoning can be found in Zeelenberg et al. (1998b).

Interestingly, our findings seem relevant to recent developments in research on the experience of *regret* following action and inaction. Gilovich and Medvec (1995) have shown that although actions result in more regret in the short run, inactions give rise to more intense regret in the long run. The authors provide several explanations for this phenomenon. Drawing on attribution theory, we suggest an additional explanation. We propose that the temporal pattern of regret reflects the temporal pattern of attributions of responsibility for the outcome. Directly after an outcome, actions are salient and are more likely to result in internal attributions than are inactions. In the long run, however, these perceptions of responsibility may change. When people look back upon actions which resulted in bad outcomes, it can be a comfort to think "at least I tried, that was all I could do," and thereby weaken the sense of responsibility for the bad outcome. People who failed to act most probably have to live with different thoughts. They are more likely to think that "I missed an opportunity, and it is my own fault", or "This bad thing happened and I have done nothing to prevent

it from happening”. If this is indeed the case, we would expect that over time people develop an increased sense of personal responsibility for the negative outcome following inaction, and a decreased sense of personal responsibility following action. Because of the link between responsibility attributions, and post-decisional affect, action regrets should diminish over time, while inaction regrets should increase.

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