

Running head: REGULATORY FOCUS AS MODERATOR OF DISJUNCTION EFFECT

Regulatory-focus as a moderator of the Disjunction effect: Promoting prevention in  
decision-making under uncertainty

Gert-Jan Kerremans

University of Tilburg

Gert- Jan Kerremans

S649848

University of Tilburg

July 2007

Bachelorthesis

Abstract

The disjunction effect says that individuals may be reluctant to act when reasons for acting are unclear. I set out to find if regulatory focus, a motivational theory wherein a promotion focus is an approach strategy of motivation and a prevention focus is an avoidance strategy of motivation, has a moderating influence on the disjunction effect. I hypothesized that individuals who are more prevention focused are more prone to the disjunction effect as opposed to individuals who are more promotion focused. Regulatory focus was measured with a questionnaire (RFQ) and the disjunction effect was measured with a decision-making scenario concerning a two-step gamble. There were three versions of distinct situations: 1. win of the first toss, 2. loss of the first toss and 3. uncertainty about the outcome of the first toss. A win in the first bet equaled a gain of € 200 and a loss equaled a loss of € 100. Respondents were then asked if they would take the exact same bet again. Hypothesis and predictions proved to be incorrect. Regulatory focus did have a moderating effect on the disjunction effect but this effect proved to be the opposite of the hypothesis. I found that people who are more promotion focused are more prone to the disjunction effect as opposed to individuals who are more prevention focused. Furthermore I investigated if people were willing to pay for elimination of uncertainty. A weak negative correlation was found for the relationship between promotion focus and willingness to pay for elimination of uncertainty.

Regulatory-focus as a moderator of the disjunction effect

The sure-thing principle (Savage, 1954), says that if there is any state of the world that leads to the exact same outcome regardless of the choice you make, the sure thing, then your choice should not depend on that (always same) outcome. In other words: the sure-thing principle states that if we prefer X to Y given any possible state of the world, then we should prefer X to Y when the exact state of the world is not known. Disjunction effect (Tversky & Shafir, 1992) is a violation of the sure-thing principle. I will illustrate the disjunction effect with an example. Imagine that you have just undergone a difficult exam. It's the end of the semester and you're exhausted. Then you find out that you either passed the exam or failed the exam and have to do it again after the holidays. That same day you find that you have been given the occasion to purchase a very attractive holiday offer. For an exceptionally low price you'll be able to stay in Hawaii for a week. There's only one catch, the offer is for today only. You'll have to decide today. Research on this holiday scenario revealed that more than half of the students choose to take the holiday offer for both when they had passed and when they had failed. So no matter what possible state, they decided to go to Hawaii. But when students did not know whether they had passed or failed, (and thus were uncertain about their state), less than a third choose the vacation. Herein lays the violation of the sure-thing principle, as you choose X no matter what state, but you choose Y when you do not know the exact state. This shift in decision-making is what is called the disjunction effect.

According to the disjunction effect individuals may be reluctant to act when reasons for acting are unclear. This may be the case when we do not know the outcome of a future event (a fuzzy event). So if we are uncertain about reasons, we may prefer to not make the decision at all. In other words: the disjunction effect holds that we prefer X to Y when A takes place and we'll prefer X to Y when A does not take place, but when the outcome of A is

unknown we'll not act upon our preferences. We will not do X under uncertainty. The disjunction effect seems to violate both logic and the notion that we base decisions on goal achievement.

But what if the most salient feature of an event is uncertainty? What helps people to construe preference in the face of uncertainty? Possibilities can range from actively seeking information and investing time and effort -when information and time are available- in an attempt to resolve their uncertainty, to giving up (e.g. when information and/or time are not available) and everything in between. It is reasonable to conceive that individuals will act on their chronically beliefs and strategies and/or beliefs and strategies that are derived from their actual situation. In this environment of uncertainty I argue that regulatory focus influences people's reactions to uncertainty. According to regulatory focus theory (Crowe & Higgins, 1997) people differ in type of strategies in decision-making.

A promotion focused decision-making strategy holds that an individual's self-regulation is concerned mainly with the occurrence and absence of positive outcomes through advancement, accomplishments and aspirations. In short a promotion focus is an approach strategy of motivation. The occurrence of positive outcomes is considered as a gain, the absence of positive outcomes is considered as a non-gain. Promotion focus is set to accomplish "hits" and avoid errors of omission, like e.g. a loss of accomplishment. Promotion focused people are inclined to use eagerness-related means. These means are typically suited to a concern with advancement, aspiration and accomplishment when pursuing goals (Crowe & Higgins, 1997).

Prevention focused decision-making strategy holds that an individual's self-regulation is concerned mainly with the absence and occurrence of negative outcomes through safety, protection, duty and responsibilities. In short, a prevention focus is an avoidance strategy of

motivation. The absences of negative outcomes are considered non-losses and the occurrence of negative outcomes are considered losses. Prevention focus is set to attain correct rejection and avoid errors of commission, like e.g. making a mistake. Prevention focused people are more inclined to use vigilance-related means. These means are particularly suited to a concern with protection, safety and responsibility when pursuing goals (Crowe & Higgins, 1997).

Variation in regulatory focus is not only found across individuals (as a chronic variable) but across situations (as a temporary induced variable) as well. Regulatory focus theory (Crowe & Higgins, 1997) assumes that nurturance related needs (e.g., nourishment) involve a promotion focus and security related needs (e.g., protection) involve a prevention focus.

Idson, Liberman & Higgins (2000) found that when promotion success (gain) is reached, it is experienced more intensely than prevention success (non-loss). This is because promotion success is achieving a maximal goal (and people hold high expectations in relation to goal-attainment) and prevention success is achieving a minimal goal (and hold lower expectations in relation to goal-attainment). They also noticed that when a prevention failure (loss) occurs, it is experienced more intensely than promotion failure (non-gain). This is because prevention failure is failure to achieve a minimal goal and promotion failure is failure to achieve a maximal goal. Furthermore it should be noted that there is a difference in representation of goals. Minimal goals are goals individuals must obtain. Maximal goals are goals individuals hope to attain (Higgins & Spiegel, 2004). In relation to the disjunction effect, people in a prevention focus may experience the uncertain event as a loss of a minimal goal (in the prevention failure case) or experience the uncertain event as a non-loss of a minimal goal (in the prevention success case). The formulation of my hypothesis is based on

this difference in experience. I expect prevention focused individuals to exhibit more cautious behavior when faced with uncertainty in decision-making. I also expect them to be more troubled by this uncertainty and pessimistic about the whole situation.

Previous research has shown that people have a tendency to violate reason (the sure-thing principle) in the face of uncertainty and show increased susceptibility to the disjunction effect. But it has never been studied *when* individuals are inhibited if uncertainty crosses their path. I argue that regulatory focus can provide us with a possible answer. Therefore the hypothesis for this research is: Individuals who are more prevention focused are more prone to the disjunction effect as opposed to individuals who are more promotion focused.

## Method

### *Participants*

A group of 152 participants consisting of university students from Tilburg University ranging from 18 to 38 years old ( $M_{age} = 21$  years, 46 males and 79 females) were asked to fill out a questionnaire first and then a decision-making scenario. Participants were randomly assigned to one of three conditions: win, lose and uncertain. Data from one of the participants was left out of analysis because the respondent did not make any decision in the decision-making scenario. Most questionnaires were filled out in the lab; others were filled out digitally or on campus. Filling out a questionnaire including the decision-making scenario took between 20 and 25 minutes.

### *Design*

This study used a between-subjects 2 (regulatory focus) x 3 (scenario) design. Total mean scores of prevention focus were calculated and then cut off at the 50<sup>th</sup> percentile to create a group high in prevention and a group low in prevention. The same procedure was used to create a group high in promotion and a group low in promotion. Regulatory focus is not a

polar concept, that is, when someone is high in promotion for example this doesn't automatically mean that he or she is low on prevention. To see whether a participant's individual chronic regulatory focus is predominantly based upon approach or avoidance strategies of motivation I calculated a score which signifies whether an individual has a more promotion oriented focus -or a more prevention oriented focus- for each participant. This was done by subtracting the prevention score of an individual off of their promotion score. In this way a negative score indicated mainly prevention focused individuals and a positive score indicated mainly promotion focused individuals. Here the zero score was the cut-off point.

### *Procedure*

Participants were politely asked for their cooperation and carefully instructed to fill out the complete questionnaire including the decision-making scenario, according to their own judgment.

First, chronic regulatory focus was measured with the Regulatory Focus Questionnaire and the questions were answered on a 7-point Likert-scale (1= *completely disagree*, 7= *completely agree*). An example of a question regarding promotion focus was: Do you often do well at different things that you try? And an example of a prevention focused nature was: How often did you obey rules and regulations that were established by your parents?

Second participants were presented a situation in which they had to answer a question concerning a gamble in a decision-making scenario. The decision-making scenario's each contained one of three different conditions. The conditions were two-step gambles. In the scenario I painted the following picture: Imagine we'll be doing a coin-toss. You call heads or tails upfront and then we'll toss the coin. If you've guessed the outcome right, you'll win € 200 if not you'll lose € 100. So this means you've got a fifty percent chance to win € 200 versus a fifty percent chance to lose a € 100. The coin has been tossed and you've guessed

right. You won € 200! We offer you the same coin-toss for a second time. You call heads or tails upfront again; we'll throw the coin again. If you've guessed the outcome right again, you'll win € 200 if not you'll lose € 100. Again you've got a fifty percent chance to win € 200 versus a fifty percent chance to lose a € 100. What are you going to do? (choose the letter of your choice) a. I accept the second bet. Or b. I decline the second bet.

There were three versions of the gambles: in the first version (illustrated above) you win the first toss which meant that you were up € 200, in the second version of the scenario you lose the first toss and you lose € 100 and in the third version you do not know the outcome of the first bet and are uncertain about the outcome of the first bet. In all three versions participants were asked if they would accept or decline the exact same bet again (the second bet, the second step of the gamble). At the end of the decision-making scenario in the uncertainty condition an extra question concerning the price participants were willing to pay in Euro to find out what the outcome of the first bet was. All questions were in Dutch.

### Results

To examine whether there was an effect of regulatory focus in the different conditions three between-subjects 2 (regulatory focus) x 3 (version) analyses of variance were performed on whether people accepted or declined the second bet. In the first ANOVA for the score which signifies whether an individual has a more promotion oriented focus a significant interaction was found. More prevention orientated individuals accepted the second bet more than the more promotion orientated individuals in the uncertainty version than in the win and loss version,  $F(2,107) = 5.566$   $p < .05$ . With 43% of more prevention orientated individuals accepting the second bet and 29% of more promotion oriented individuals accepting the second bet in the uncertainty version. See Table 1a for a complete overview of the percentages. Means and standard deviations are presented in Table 1b.



No significant interactions were found in the second ANOVA for the mean promotion score for Promotion Focus x Version  $F(2, 117) = .590$ . With 46% of individuals with a low score on promotion accepting the second bet. And with 38% of individuals with a high score on promotion accepting the second bet in the uncertainty version. See Table 2a for a complete overview of the percentages. Means and standard deviations are presented in Table 2b.

The third ANOVA for the mean prevention score there was a significant interaction Prevention Focus x Version  $F(2, 113) = 4.381$   $p < .05$ ; individuals with a high score on prevention chose to accept the second bet significantly more than the individuals with a low score on prevention in the uncertainty version than in the win and loss version. With 29% of individuals with a low score on prevention accepting the second bet in the uncertainty version. And with 45% of individuals with a high score on prevention accepting the second bet. See Table 3a for a complete overview of the percentages Means and standard deviations are presented in Table 3b. No significant main effect of regulatory focus was found.

The question regarding the relationship between regulatory focus and willingness to pay for information to relieve uncertainty was addressed by calculating a Pearson product-moment correlation coefficient. There was a weak, negative correlation between promotion focus and the amount people were willing to pay for information that resolves the uncertainty ( $r = -.185$ ,  $n = 39$ ,  $p = .259$ ). For prevention focus there was no relationship with the amount people were willing to pay.

### Discussion

Before discussing the main findings of this research I would like to justify my mentioning of the above correlation while it has not reached significance. The significance of  $r$  is strongly dependent on the sample size. Sample size is small here (39). According to Pallant (2001) this small correlation might be significant in a larger sample (e.g.  $N = 100+$ ).

For me this was reason enough to at least mention the correlation. My main hypothesis for this research was not supported. Individuals who are more prevention focused are not more prone to the disjunction effect as opposed to individuals who are more promotion focused.

Actually I found the complete opposite of my hypothesis to be true about regulatory focus in this research. Individuals who are low in prevention focused are more inclined to fall prey to the disjunction effect. But what can be an explanation for these findings? Let's start by figuring out why more highly prevention focused individuals are less inclined to fall prey to the disjunction effect. Possibly prevention focused individuals give more thought to their decisions and think through the possibilities that exist in a given situation more extensively. They may invest more time and effort to think about a decision, gather more information. And process this information extensively. They also may think about a problem more thorough to avoid negative outcomes. People who are high in prevention focus may have a tendency toward avoiding regret. The use of means with a focus on protection, safety and responsibility ensure a careful examination of the situation and the steps to be taken when pursuing goals (Higgins & Spiegel, 2004). And thus steer clear of any anticipated regret and resolving the uncertainty. Individuals who are high in prevention may become more uncertain from uncertainty but have a greater need to actively search ways to relieve that uncertainty and reach the minimal goal. They may do this by investing time and effort to think through the possibilities that arise from a particular situation by gathering as much information as is needed to confidently make the right decision.

This leaves us with the individuals who are low in prevention and do not show the same behaviors as the high prevention individuals (but do show resemblance with the promotion focused individuals). Possibly the low prevention individual does not have such a pressing need to search ways to relieve that uncertainty and therefore is more susceptible to

the confusion that can come with uncertainty. With a lower need to resolve the uncertainty there can also be a more negative outlook on increasing efforts and or time. This implies that a low prevention individual does not think things through like a person with a high prevention focus. And does not give more thought to his or her decisions and does not think through the possibilities that exist in a given situation (in this case uncertainty) as extensively as a high prevention individual. Arguably people with low prevention have a lesser need to avoid regret which might be based on shallower information-processing.

We have seen that prevention strategies can be a powerful tool to make the best possible decision. Here it is that we stumble upon a paradox. Under uncertainty it is preferable to adopt a prevention focused strategy to achieve the occurrence of a positive outcome. As opposed to a promotion focused strategy which usually is associated with advancement, accomplishments, and aspirations. Herein lays a practical implication for decision-making under uncertainty. By promoting a (highly) prevention orientated strategy we can prevent mistakes in decision-making under uncertain circumstances. In today's society there is an emphasis on the occurrence of positive outcomes through advancement, accomplishments and aspirations, and approach strategies of motivation. In short for the promotion oriented strategy. Here we find that this is but one side of the story, and that sometimes it is impossible to reach your goals if one should only apply promotion oriented strategies.

A possible theoretical implication for the traditional theory in decision-making lays in the typical characterization of choice as the maximalization of value (Shafir, Simonson, Tversky, 1993). This research contributes to the notion that this is a bit of an oversimplification of reality. It shows that it is (at least) equally important to examine how preferred and chronic strategies (in this case promotion and prevention oriented strategies) affect people's

judgmental processes and behavior in everyday life and in exceptional situations (Higgins & Spiegel, 2004).

Possible limitations of this research could e.g. be the sample. It consists of mostly university students. Furthermore in this research I did not measure what strategy people used to make the final decision in the scenario. I measured which chronically regulatory focus people have, if people are more prevention orientated or promotion orientated and to what degree (high or low). The decision-making scenarios are without exception decisions that have to be made immediately, there is not much time available. According to Pennington and Roese (2003) promotion focus diminishes when temporal resources run out while prevention focus remains at an equal level. This means that there is a shift towards a more prevention focus orientated decision-making strategy when goal-attainment is more temporally proximate, e.g. when a decision has to be made on the spot. Approaching deadlines and time restrictions have been known to lead to behavior associated with a more prevention focused decision-making strategy like decreased risk taking, greater attention to negative information, greater selectivity in information processing, and restrictions in the number of considered alternatives (Lieberman, Idson, Camacho, & Higgins, 1999). When we look at the scenarios in the light of these findings it may be possible that the environmental/ situational requirements influence the chronically regulatory focus of an individual. This may limit the findings of this research. But it also provides a basis for future research where participants are presented with a situation in which there is more temporal distance to between being informed about a future decision and actually making the decision.

After reading Van Dijk & Zeelenberg (2006) about the influence of curiosity and regret aversion on decision-making under uncertainty. And how curiosity can overcome regret aversion. It occurred to me that there may be a link with regulatory focus. I suggest that when

people are high in prevention they may have a tendency toward avoiding regret. Then they will proceed to process information extensively and show behavior that can be called curiosity. Prevention focus could be a strategy used in the process of overcoming regret aversion. Future research could provide an answer to this statement.

References

- Crowe, E., & Higgins, E., T. (1997) Regulatory focus and strategic inclinations: Promotion and prevention in decision-making. *Organizational Behavior and Human Decision Processes*. 69. No2. 117-132.
- Idson, L., C., Liberman, N., & Higgins, E., T. (2000). Distinguishing gains from nonlosses and losses from nongains: A regulatory focus perspective on hedonic intensity. *Journal of Experimental Social Psychology*, 36, 252-274.
- Higgins, E.,T., (2002). How Self-regulation creates distinct values: The case of promotion and prevention decision making. *Journal of Consumer Psychology*, 12(3), 177-191.
- Higgins, E., T., & Spiegel, S. (2004). Promotion and prevention strategies for self-regulation: A motivated cognition perspective. In Baumeister, R., F., & Vohs, K., D. (2004) *Handbook of Self-Regulation: Research, Theory & Applications* (pp.171- 187). Guilford Press.
- Liberman, N., Idson, L.C., Camacho, C.J., & Higgins, E.T. (1999). Promotion and prevention choices between stability and change. *Journal of Personality and Social Psychology*, 77. 1135-1145.
- Pallant, J., *Spss survival manual*. Maidenhead: Open University Press, 2001
- Payne, J. W., Bettman, J. R., & Johnson, E.J. (1992). Behavioral decision research: a constructive process perspective. *Annual Review of Psychology*. 43, 87-131.
- Pennington, G.L., & Roese, J.R. (2003) Regulatory focus and temporal distance. *Journal of Experimental Social Psychology* 39, 563-576.
- Savage, L.J., *The foundations of statistics*. New York: Wiley & Sons,1954
- Shafir, E., Simonson, I., & Tversky, A. (1993) Reason-based choice. *Cognition*, 49, 11-36

Tversky, A., & Shafir, E. (1992). The disjunction effect in choice under uncertainty.

*Psychological Science*. 3. 305-309.

Van Dijk, E., & Zeelenberg, M. (2006) When curiosity killed regret: Avoiding or seeking the unknown in decision-making under uncertainty. *Journal of Experimental Social*

*Psychology*. Article in press.

Table 1a.

Percentages of acceptance of the second bet of the ‘integrated’ scores

Choice	Regulatory focus	Win version	Loss version	Uncertainty
Accept the second bet	More prevention focused	30%	42%	43%
Accept the second bet	More promotion focused	36%	13%	29%

Table 1b

Mean +/- SD for score that signifies a more promotion or more prevention focused orientation

Version	Regulatory focus	Mean	Standard deviation	N
Win version	More prevention	1,30	,470	23
	More promotion	1,36	,497	14
Loss version	More prevention	1,58	,504	24
	More promotion	1,13	,352	15
Uncertainty	More prevention	1,43	,507	23
	More promotion	1,71	,469	14

Table 2a

Percentages of acceptance of the second bet of the promotion scores

Choice	Regulatory focus	Win version	Loss version	Uncertainty
Accept the second bet	Low promotion	38%	45%	46%
Accept the second bet	High promotion	29%	44%	38%



Table 2b

Mean +/- SD for high and low promotion scores

Version	Regulatory focus	Mean	Standard deviation	N
Win version	Low promotion	1,38	,506	13
	High promotion	1,29	,460	28
Loss version	Low promotion	1,45	,522	11
	High promotion	1,44	,504	32
Uncertainty	Low promotion	1,46	,519	13
	High promotion	1,62	,496	26

Table 3a

Percentages of acceptance of the second bet of the prevention scores

Choice	Regulatory focus	Win version	Loss version	Uncertainty
Accept the second bet	Low prevention	33%	22%	29%
Accept the second bet	High prevention	33%	39%	45%

Table 3b

Mean +/- SD for high and low prevention scores

Version	Regulatory focus	Mean	Standard deviation	N
Win version	Low prevention	1,33	,492	12
	High prevention	1,33	,480	27
Loss version	Low prevention	1,22	,428	18
	High prevention	1,61	,499	23
Uncertainty	Low prevention	1,71	,470	17
	High promotion	1,45	,510	22



