Searching For Negative Information
The Pains of "Suspecting the Worst" Versus the Comforts of "Knowing the Worst"

Yaniv Shani

Searching For Negative Information
The Pains of "Suspecting the Worst" Versus the Comforts of "Knowing the Worst"

Proefschrift

ter verkrijging van de graad van doctor
aan de Universiteit van Tilburg
op gezag van de rector magnificus
prof. dr. F. A. van der Duyn Schouten

in het openbaar te verdedigen ten overstaan van een
door het college voor promoties aangewezen commissie
in de aula van de Universiteit
op vrijdag 14 september 2007 om 14.15 uur

door Yaniv Shani
geboren op 17 maart 1974 te Eilat, Israel

Promotor:

Prof. Dr. Marcel Zeelenberg

ISBN/EAN: 978-90-5335-129-1
Cover design: Liat Lerner

Printed by Ridderprint Offsetdrukkerij B.V., Ridderkerk

Committee:

Orit E. Tykocinski, PhD, Professor of Social Psychology, Department of Behavioral sciences, Ben Gurion University, Beer-Sheva, Israel.

Gideon Keren, PhD, Professor of Cognitive Psychology, Department of Technology Management, Eindhoven University of Technology, Eindhoven, The Netherlands.

Eric van Dijk, PhD, Professor Social Psychology, Department of Social and Organizational Psychology, Leiden University, Leiden, The Netherlands.

Rik G.M. Pieters, PhD, Professor of Marketing, Department of Marketing, Tilburg University, The Netherlands.

Diederik A. Stapel, PhD, Professor of Consumer Science, Tilburg Institute for Behavioral Economics Research (TIBER), Tilburg University, The Netherlands.

Eric R. Igou, PhD, Assistant Professor of Social Psychology, Department of Social Psychology, Tilburg University, The Netherlands.

Contents

Chapter 1

"Suspecting the Worst" Versus "Knowing the Worst": An Introduction

> *"As we know, there are known knowns. There are things we know we know. We also know there are known unknowns. That is to say, we know there are some things we do not know. But there are also unknown unknowns, the ones we don't know we don't know.*
>
> *Furthermore, there are known knowns we know but don't want you to know, and things you know we know no one knows because we made them up. There are possible knowns we make up and pass off as known knowns, but we know they are not known and know not to admit they're not known but in fact known knowns.*
>
> *There are also unknown knowns, things we'd like to know, but don't know, but know someone who can doctor them and pass them off as known knowns. But take heart, we know a lot. Like we know a lot about you, Chuck, and we know that WMDs exist, and we know that eventually they will be used to kill you and your wife and 2.5 kids. As for those unknown unknowns we don't know about, what you don't know can't hurt you or influence rational policy.*
>
> *You know?"*
>
> The United States Defense Secretary, Donald Rumsfeld explains the danger of ignorance and its relevance for the US decision to invade Iraq in what he has termed "unknown knowns" (Feb. 12, 2002,. http://www.whitehouse.org/ask/drumsfeld.asp).

The second invasion of the United Sates to Iraq aimed to gain information and reduce uncertainty (i.e., known unknowns) regarding its potential holdings of

weapons of mass destruction. The US was willing to invest abundant amounts of money, and to risk human lives in order to reduce uncertainties, and restore confidence. Note that the US did not invade countries such as Iran or North Korea, which are known to hold such weapons (i.e., known knowns).

The desire to know is well established in human kind's history. Eve was the first to demonstrate the power of curiosity. Perfectly aware of the terrible consequences of her behavior, she could not resist the forbidden fruit - a temptation issue which was later known as the first deadly sin. Could God really blame Eve for her "irrational" or "irresponsible" behavior, being the one to induce curiosity by placing the tree of knowledge in the middle of garden, yet forbidding her from eating or touching the fruits?! Is it possible that Eve, being constantly reminded by the presence of the tree, lost her resistance to the snake's repeated whispers in her ear, inducing more and more and more curiosity? Finally, she broke-down and acted similarly to all living organisms when their homoeostasis is violated? She wanted her peace of mind back. It seems that even God was willing to accept this desire for knowledge, as eventually Eve was only deported out of the garden and not immediately sentenced to death.

The forbidden fruit, Pandora's Box, or Lot's wife: human narratives provide many examples of people satisfying their curiosity at terrible costs. Nowadays as well, people often expose themselves to painful knowledge even when the information is of no use for their future goals. For instance, when heard that your ex-partner has entered into a new relationship, you may want to learn who is this new person, how long the "happy couple" has been dating, the circumstances under which they met, who was the first to initiate the relationship, or if they met before or after your relationship ended. In a similar vein, customers may compare prices of products they have long-ago purchased, if they believe that they were ripped-off by the sales-people, or when suspecting to have bypassed an opportunity for a large discount. One of the main objectives of the current dissertation is to explain the underlying mechanism for such painful, "allegedly counterintuitive" search for knowledge.

Alternatively, individuals sometimes avoid information that is essential for their immediate survival or that may serve their long term goals. For example, in the short-run testing ourselves for potential carry of contaminating diseases

may increase the usability of treatments. In the long-run, knowing whether or not one is infected with a sexually transmitted disease may also reduce the risk of infecting others. Additionally, knowing that one is not infected with a sexually contaminating disease may reduce the risk of being infected in the future, because it may prevent one from engaging in future reckless sexual behavior. Nevertheless, many people check whether they carry such a disease, for example, only *after* returning from a long and a wild trip in a far and exotic country, or only *after* they have met the right partner. Another objective of this dissertation is to explain why people avoid important and useful information.

Overall, in this dissertation we discuss determinants of information search, and information avoidance. More specifically, we explain why individuals are willing to search painful information particularly when they are likely to find it, why they prefer to temporarily avoid important information that may serve their future goals, and under which condition they are better capable to evaluate the importance and the relevance of information for their future goals. Particularly, we propose to view the avoidance of important knowledge and the search of painful information, as a strategy to regulate the intensity of negative feelings we continually experience throughout our daily affair.

Overview of the Chapters

Let us now provide an overview of the empirical chapters in this dissertation (Chapters 2-6). All summaries of the chapters begin with a short example to illustrate the information search-avoidance dilemma. The main point of each chapter, theory, predictions and main findings will then follow. The overview exemplifies the diversity of life circumstances in which individuals are predisposed to search painful knowledge, capable to overcome such tendencies, and the causes of the phenomenon. It should be noted that each of the empirical chapters represent individual articles that are either in press or submitted for publication. This holds that the individual chapters can be read separately and there exists some overlap between them.

Chapter 2
When and Why Do We Want to Know?
How Experienced Regret Promotes Post-Decision Information Search

After spending 3 weeks of comparing notebook prices, my friend Josh finally invited me to admire his brand new IBM laptop. When I arrived to observe the new purchase, I found that Josh was still comparing computer prices on the internet. "Are you looking to buy another computer?" I wondered. Fervently looking into computers auctions, Josh explained; "No! I just want to make sure that I was not ripped off with purchasing this computer. I am not a sucker, you know!"

In Chapter 2, the effect of experienced regret over an initial decision to seek out post-decision information was examined. Our starting point was that people want to make good decisions and that the experience of regret signals that a bad decision was made. Information about forgone alternative provides a reference point for individuals to evaluate their own decision (Baron & Hershey, 1988; Keren & de Bruin, 2003). We expected individuals to search for information regarding a forgone alternative in hope to increase confidence that they made a good decision. One may argue however, that such a search is counterproductive as it may lead to the finding that an inferior decision was made, a painful experience by itself.

Interestingly, the literature offers different approaches which predict different behaviors (i.e., information seeking vs. avoidance) in relevance to the fear of experiencing negative feelings. Thus, while one approach focuses on preventing *future* negative feelings by avoiding information (Festinger, 1957; Northcraft & Ashford, 1990), the other focuses on ending the *current* negative feeling by seeking the information (Festinger, 1964). Chapter 2 deals with this contradiction by distinguishing and comparing the two conflicting motivations to search or avoid painful information. We did so by distinguishing regret into two components which demonstrate two contradictory motivations: experienced regret (e.g., an unwarranted regret Josh may experience thinking that he could have purchased the computer for a better price) and anticipated regret (e.g., regretting the decision to seek information assuming that Josh finds out that indeed he could have paid less). The results show that it is the experience of regret that contributes most to the decision to acquire the

information. Anticipated regret, however, did not have any noticeable effects on post-decision information search.

Realizing that it is experienced regret and not anticipated regret that drives post-decision information search, we end this chapter with two new queries. First, regret is an emotion that we experience when realizing or imagining that our situation would or could have been better. Why then would people search information that may confirm their negative feeling? Could it be that definite knowledge about missed opportunities or about making an inferior decision is experienced less aversively than the unpleasant feeling that is involved with ignorance? What about the notion that "what you do not know does not hurt?"

Second, Chapter 2 showed that regret can be elicited by individuals' initial belief that they indeed have a reason to regret their early decisions. In such situations, it would seem counterintuitive if individuals searched information that is likely to confirm their early suspicion. This is mainly because the likelihood of finding out that their suspicions is warranted, increases. Could definite knowledge be experienced less-aversively than ignorance (i.e., lack of knowledge)? Would the search of painful information increase with the likelihood of finding out such distressing information? These two queries are answered in Chapter 3.

Chapter 3
When Ignorance is Not Bliss:
How Feelings of Discomfort Promote the Search for Negative Information

You have been filling-out lottery tickets regularly. A week ago you filled out your lottery ticket as usual, but forgot to send it in. This morning, you glanced at the newspaper and noticed the numbers that won the $100 prize. You realized that two (five) out of the six lottery numbers were identical to the numbers you had on your unsent form. You were not sure regarding the rest of the numbers and the lottery ticket is in your house.

Chapter 3 looks at two factors that may relate to the dilemma of whether or not to search for potential painful information: (1) the likelihood (i.e., probability) of finding out whether an opportunity was missed, and (2) our

early conviction that definite knowledge is less painful than the unpleasant feeling that is involved with ignorance.

Relaxing the assumption that people search information in hope to alleviate their negative feelings resulted in two contradicting predictions concerning the role of probability in the decision to search potential negative information. One prediction is that the willingness to search painful knowledge decreases with the increase in likelihood of finding out negative information. If we return to our lottery opening scenario, people should avoid information that may reveal that the lottery ticket they forgot to send in is the winning ticket, particularly when they are likely to encounter such a painful truth. A second, less-intuitive prediction is that the tendency to search information that may reveal whether or not an opportunity to win the lottery was missed, increase with the likelihood of encountering such information. We follow the second prediction. This is based on the main findings of Chapter 2, namely; it is the experience of negative feelings that drives information search and not its anticipation. A reasonable conclusion of this hypothesis would be that people consider what they *do not know* to be more distressing than what they *may found out*.

The theoretical part of Chapter 3 is based on Information Gap Theory (Loewenstein, 1994), which interprets curiosity as a form of cognitively induced deprivation that arises from the perception of *gaps* in knowledge. The theory offers that the closer individuals are to know or understand a certain fact, the more curious they feel and more dissatisfied they are with their state of ignorance. Although never applied to probabilities, we assumed that how negative people feel may depend on their subjective or objective estimations of encountering negative information. The higher the probability of finding out that an opportunity was missed the more negative people may feel because the more occupied and dissatisfied they would be with their state of ignorance.

Quite amusing, the effects of probabilities on distressful feelings and information search may shed light on Donald Rumsfeld's explanation to why it was so important to invade Iraq. When the probability to uncover negative information is negligible, the attention that is given to uncertainty is minimal. Consequently, distressful feelings are not experienced and "irrational" information search is not found. Similarly, Rumsfeld's "unknown unknowns" propose that "what you don't know can't hurt you or influence rational policy."

This becomes more complicated when one construes the probability of encountering negative knowledge (e.g., weapons of mass destruction) as high. Then the individual's attention is given to what is not known, which in turn enhances the need to reduce these gaps in knowledge. As a result, suspicions and associated distressful feelings kick in and individuals are more inclined to take action in order to reassure themselves, for instance by uncovering the potential unpleasant truths, or alternatively by invading a country. Using Donald Rumsfeld's words to emphasize these suspicions: "…unknown knowns, things we'd like to know, but don't know, but know someone who can doctor them and pass them off as known knowns" (Rumsfeld, 2002).

To this end, we discussed and explained when and why do people search painful information that is often of no future use. Studying information search is not complete without understanding the conditions under which people prefer to avoid information. More interestingly, when or why do people avoid information that is important for their future goals? Chapter 4 demonstrates and explains the circumstances under which people avoid useful information.

Chapter 4
Choosing Ignorance: Why do People Avoid Useful Information?

Yet ah! why should they know their fate?
Since sorrow never comes too late,
And happiness too swiftly flies.
Thought would destroy their paradise.
No more; where ignorance is bliss,
'Tis folly to be wise.

Thomas Gray (1891)

A week before I moved to the Netherlands in order to work on the current dissertation, I visited a dear friend of mine in the hospital. Katya, one of the nurses at the department where my friend was hospitalized, asked me whether I was willing to donate blood because the hospital blood reserves were nearly drained. Of course, I agreed. While donating blood Katya mentioned that nowadays with a simple blood test, the responsible gene for potential deadly illness such as cancer, prenatal disorders and other genetic diseases can

easily be identified. Half joking, she asked me whether I would like to know if I carry the genes for such diseases. Being extremely exited about the coming three years in the Netherlands, I found the question disturbing and difficult to answer. I was concerned that finding out that I do carry such genes would distract and prevent me from working, or worse, hinder the pleasure of living in Europe for three years. At that moment, I did not know how serious Katya was about the idea of having me tested. Nevertheless, I told her that I had to think about it.

We do not have to go to the extremes to find situations in which people avoid important information. A colleague of mine for instance, does not like to analyze the results of an experiment just before the weekend starts. She explained that "the results will still be there on Monday and there is no point of ruining a potentially good weekend with potential bad data". If we return to our opening poem (Gray, 1891), this is exactly the reasoning we would offer for why people avoid usable and relevant information. Following this, because happy moments are rare (e.g., "happiness too swiftly flies") and it is only a matter of time before we face painful truths that may distort our happiness (e.g., "sorrow never comes too late") or even cause rumination (e.g., "thought would destroy their paradise"), when negative information may interfere with people's future planning, they may strategically avoid or delay uncovering this information in order to extend life's pleasurable moments. In other words, the timing chosen to expose ourselves to potentially painful information serves as a means to regulate the intensity and amount of negative and positive experiences in our lives.

With the first three chapters in this dissertation, we offer that searching and avoiding information serve as strategies to regulate negative feelings. Many of the examples and experiments used in this dissertation demonstrate how individuals manage their negative feelings by searching painful information. Alternatively, in Chapter 4 we demonstrate how important and relevant information such as HIV test results, or academics achievements, are ignored because people feel that they *temporally* cannot handle having definite knowledge. Are we doomed to be struck by our negative feelings, forever captured in a vicious cycle that forces the search of painful knowledge? Or perhaps we sometimes are competent to see "the bigger picture" and able to avoid the vicious cycle of negative knowledge?! This question is particularly

interesting because we are often coerced to search painful information that is not consistent with our high level interests, such as learning or self-improvement goals. In Chapter 5 we address this question and offer our curious readers such hope.

Chapter 5
Different Ways of Looking at Unpleasant Truths: How Construal Levels Influence Information Search

Wishful thinking or unrealistic optimism, a wedding day is considered to be a happy occasion in which money is the less important feature of the central event of being married. Now, imagine that a day after your wedding you hear that the company that videotaped the event, may have ripped you off. How interested would you be in finding out whether or not you were financially ripped-off on your wedding day? Surprisingly, yet consistent with the framework we presented in Chapters 2 and 3, participants kept looking for the peripheral information. They searched the information despite their recent marriage, or even when told that it would be impossible to reclaim the lost money.

In Chapter 5 we wanted to demonstrate a decrease in individuals' "need to know" which is derived from the realization that such affective information is not relevant for future goals and is actually subordinate to the wedding event. We wanted to facilitate individuals' ability to comprehend that the disconcerting information that enhanced their negative feelings, is *less-important* and is not worth looking for. We found the central assumptions of construal level theory (CLT; Trope & Liberman, 2003) to be useful in this regard.

Construal level theory offers that the same situation can be represented in abstract or concrete ways, depending of how psychologically distant the situation is. An abstract (high-level) construal consists of central and essential characters of a situation, whereas a concrete (low-level) construal entails features that are more peripheral. With regard to actions, high-level construals consist of their superordinate goals, for instance, information that explains "why" this action is performed (aspects of desirability). Low-level construals on

the other hand, entail subordinate goals and "how" (feasibility) aspects of the situation.

In Chapter 5 we show that when thinking abstractly (think of *why* – for what reasons) about both positive and negative aspects of a situation (e.g., being ripped off on your wedding day), individuals were less irritated and less interested in peripheral knowledge than when construing the event in concrete terms (think of *how* – in what way). We offer that the perspective used to view and interpret complex situations in life, is related to individuals' ability to look beyond the situation's irritating aspects, and to have the more important features in their focal point. Most importantly, the research in Chapter 5 extends our past work on information search and information avoidance, showing that we are not doomed to be struck by our own negative feelings.

The main findings of the four empirical studies are summarized in Chapter 6. This chapter discusses the motivational values of information search. It elaborates on the implications of information search and information avoidance for well being.

Chapter 2

When and Why Do We Want to Know? How Experienced Regret Promotes Post-Decision Information Search[1]

Imagine the following scenario: A man bids for a stereo in an auction, and purchases it with the highest bid. A week later, he sees the same stereo in a shop front window with a big "SALE" sign. Immediately he experiences a sense of regret over his early purchase, even though he does not know if this feeling is warranted (Carmon, Wertenbroch, & Zeelenberg, 2003). The man now faces the dilemma of whether to find out the stereo's price. On the one hand, he has to consider the emotional impact of finding out that his winning bid was higher or lower than the sale price of the stereo. Since negative information weighs heavier than positive (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001), he may decide not to look for the price in order to avoid even more regret. On the other hand, not knowing the price of the discounted stereo has a cost in itself, expressed in our aversion to living with uncertainty. As such, it is possible that this man would rather expose himself to the information, hoping that his as yet incomplete regret will disappear upon finding that his bid was indeed lower than the stereo's current price.

In the present chapter, we investigated how individuals cope with this dilemma of post-decisional information search. More specifically, we looked at two factors that may influence this behavior: the experience of regret associated with the initial decision and whether the newly found information is expected to be supportive of the initial decision or not.

How could experienced regret influence post-decisional information search? Our reasoning is that people want to make good decisions, and regret is experienced as a signal that a bad decision was made. Responsibility is strongly associated with regret; we typically feel more regret over bad outcomes

[1] This chapter is based on Shani & Zeelenberg (2007).

for which we were responsible (Zeelenberg, van Dijk, & Manstead, 2000). Since the outcome of a forgone alternative (OFA) may provide a reference point that people may use when evaluating the quality of a decision (Baron & Hershey, 1988; Keren & de Bruin, 2003), individuals may search for the OFA, hoping to find that they made a good decision, thus precluding further regret.

In addition, people are generally averse to uncertainty (Loewenstein, 1994; Van den Bos & Lind, 2002; Wilson, Gilbert, & Centerbar, 2002), and thinking that they have made a wrong decision, but not knowing for sure, may cause them to overcome their fear of regret, in order to resolve uncertainty (Van de Ven, Zeelenberg, & Van Dijk, 2005; Van Dijk & Zeelenberg, 2007). Thus, after a decision has been made and initial regret is experienced regarding the obtained outcome, people may be even more motivated to seek the OFA, in the hope of reassuring themselves by reducing or eliminating their regret. In other words, people might be even more motivated to seek the OFA when they worry that they could have done better than when they believe that they did well. This is counterintuitive, suggesting that individuals seek information when they believe that they have made a bad decision, and not only when they believe that they have made a good one.

This dilemma whether to seek or avoid information becomes most evident when it is difficult to predict whether the outcome of the forgone alternative is better or worse. Under these conditions individuals have to balance, on the one hand, the ongoing uncertainty and the associated unpleasant feeling of initial regret (when avoiding the information) and, on the other hand, their hope that the information will be positive with the possibility of a negative outcome (when seeking the information).

Information seeking and information avoidance

Over the years, theories have suggested that the feelings individuals expect may affect their decisions (e.g., Bell, 1982; Janis & Mann, 1977; Loomes & Sugden, 1982). When it comes to feedback inquiry, the literature provides different predictions of how negative feelings affect the decision to seek or avoid information. For instance, Northcraft and Ashford (1990) suggested that when people believe that feedback will be negative, they tend to avoid it, whereas Wicklund and Brehm (1976) stated that it is difficult to predict

information seeking or information avoidance. Festinger's (1957) theory of cognitive dissonance predicted that dissonance produces information avoidance with respect to the OFA. Dissonance is similar to what we refer to here as a sense of initial regret that stems from knowing the decision outcome but not yet the outcome forgone (Brehm & Wicklund, 1970; Festinger & Walster, 1964; Roese & Summerville, 2005; Wicklund & Brehm, 1976). The rationale for this prediction was that what one does not know does not hurt. However, when Festinger elaborated his theory in 1964, he predicted that dissonance would result in selective information seeking, to bolster the individual's original decision.

Although these different approaches predict different behaviors (i.e., information seeking vs. avoidance), they are both predicated on the fear of experiencing negative feelings. Thus, while one approach focuses on preventing *future* negative feelings by avoiding information (Festinger, 1957; Northcraft & Ashford, 1990), the other focuses on ending the *current* negative feeling, by seeking the information (Festinger, 1964).

These approaches may also explain the information-seeking tendency in terms of regulation strategies that are available to individuals before and after a decision was made (Zeelenberg & Pieters, 2006, 2007). Thus, when regret is anticipated, people might try and regulate it by improving the quality of the decision, by justifying it, transferring responsibility, by ensuring that it can be reversed or delayed, or by avoiding feedback about forgone alternatives. They may even do so before the decision is made. However, when regret is already experienced (in other words, after the decision is made and the outcome is known), justifying the decision remains a relevant strategy for dealing with the regret, simply because the other strategies are not available anymore or difficult to implement (See also Connolly & Zeelenberg, 2002; Inman & Zeelenberg, 2002).

Following this reasoning, acquiring further information might be the only way left for the individuals to justify their decision and undo their regret, finding out that they did not, after all, make such a bad decision. The OFA provides a reference point and information about the decision quality (Baron & Hershey, 1988). The idea that people are willing to expose themselves to potential unpleasant information in order to refute it, is also consistent with Frey's

(1986) explanation for the lack of evidence of information avoidance in the literature: "Avoidance of further dissonant information merely hinders any increase in the existing dissonance. It does not, however, decrease the dissonance itself" (p. 70).

Information instrumentality

As noted earlier, individuals who are willing to expose themselves to information is taking a risk of receiving negative information. This information, however, may be used in similar situations in the future. The processes related to *learning* from our negative feelings and negative information are described in the counterfactual thinking literature (Markman, Gavanski, Sherman, & Mcmullen, 1993; Roese, 1994; Zeelenberg, 1999). Roese (1994) described two possible counterfactual comparisons: *Upward*, in which a person compares a current situation to an alternative scenario with a better outcome, and *Downward* in which a person compares a current situation to an alternative with a worse outcome. While downward comparison may lead to positive feelings, upward comparison might summon unpleasant feelings when the current situation is compared to better alternatives. Despite its short-term emotional cost, upward comparison has a functional value since it allows individuals to learn from their mistakes. Although the potential to learn from a previous decision in order to improve our chances in the future is a reasonable reason for post-decision information search, we suggest that it is not the only reason.

In the present chapter we demonstrate that people seek post-decisional information, not only when it is expected to be positive, or when they can learn from it, but also when they expect the information to be negative. They are willing to do so in hope that their expectation is disconfirmed and so reduce their feelings of regret. We expect thus that the more people regret their initial decision, the more willing they will be to acquire the information.

Overview of the Experiments

We conducted five experiments to investigate how regret is related to post-decision information search. In Experiment 2.1 we found that individuals are more willing to acquire post-decision counterfactual information when they were directly responsible for the previous decision. This finding was replicated in Experiment 2.2, in which the role of outcome uncertainty was also studied. We showed that responsibility only affects information seeking when the value of the missing information is not clear (i.e., the individual is uncertain whether it will be positive or negative). We expected the experience of regret to be the main motivation for acquiring this information because seeking counterfactual information gives participants the opportunity to reduce their regret by finding out that the outcome of the forgone decision is no better than the outcome of their decision. Experiment 2.3 included measures of different emotions, and showed that regret is related to OFA information seeking even when controlling for other emotions. In Experiment 2.4, we manipulated the level of regret directly, demonstrating its effect on people's information-seeking tendency; the influence of regret overruled learning goals as an explanation for the post-decision information search. Finally, in Experiment 2.5 we compared two additional motivations for information seeking, namely the ability to use the information in the future and the possibility to avoid future regret. This experiment supported our theory that wanting to reduce the experience of regret leads to post-decision information search, regardless of the potential to use the information in the future. Anticipated regret had no influence on post-decision information search.

Experiment 2.1

Method

Participants and design

Forty students (26 males, 14 females) at Tilburg University volunteered to participate in this study. They were randomly assigned to one of the two conditions (Responsibility: Self vs. Other).

Procedure and measures

Participants were approached individually at several locations on the

university campus. They were provided with a two-page questionnaire containing the scenario and the dependent measures. In the "self-responsibility" condition (where the individual was personally responsible for the decision), the scenario read as follows:

> Five years ago, your uncle died and left you €1000. Since you wanted to invest the money, you had to choose between two types of stocks: Stock A, which guaranteed a return of between €1000 and €3000, and Stock B, which guaranteed a return of between €1400 and €1900 at the end of the five years (depending on the stock market index at the end of these five years). After careful consideration, you decided to invest in Stock B.
>
> This morning you received a letter from the bank informing you that you made a total sum of €1750. You know that the stock market has been fluctuating for the last 5 years.

In the "other responsibility" condition (where the individual was not personally responsible for the decision), participants read that their uncle had made the investment. After reading the scenario, participants indicated how responsible they felt for choosing the stock (0 = *not at all*, 10 = *very much*). Information seeking was assessed via the two items (α = .95): the likelihood that the participants would search for information about the current value of Stock A (e.g., via newspapers, internet or any other form of information) (0 = *not likely*, 10 = *very likely*) and how curious participants were regarding the value of the alternative stock (Stock A) (0 = *not curious at all*, 10 = *very curious*).

Results and discussion

The results are shown in Table 2.1. As expected, participants reported feeling more responsible in the self-responsibility condition (where they chose the stock) than in the other-responsibility condition (where their uncle chose the stock). More importantly, participants were more willing to seek information when they were responsible for the decision than when their uncle was responsible.

Table 2.1

Means and Standard Deviations of Responsibility and Information Seeking as a Function of Responsibility (Experiment 2.1)

Dependent Variables	Responsibility						
	Self		Other		*t* (38)	*p*	*d*
	M	*SD*	*M*	*SD*			
Responsibility	8.80	(1.32)	2.00	(2.33)	11.31	.001	3.57
Information Seeking	6.80	(2.21)	4.72	(3.42)	2.27	.028	.72

Note. Values represent means on 11-point scales (0-10), with higher values indicating more responsibility and more information seeking.

Experiment 2.2

We suggested previously that people might seek information in order to reassure themselves about the outcome of their investment being better than the alternative. This may happen when they do not know whether the outcome of their investment is better or worse than the outcome of the forgone investment. It is therefore likely that not knowing whether the value of the alternative stock is better or worse than the value of the chosen stock (i.e., being uncertain), serves as a moderator to the tendency to acquire information, simply because it allows the possibility of finding out that the alternative stock had a worse outcome.

This was explored in Experiment 2.2. Participants read that they had decided to invest in either Stock B (as in Experiment 2.1) or in Stock A. Uncertainty was manipulated by changing the final outcome of the stocks (as will be explained in the next paragraph). This allowed us to test the hypothesis that responsibility affects information seeking particularly when it is not clear what the outcome of the forgone alternative is compared to that of one's own decision.

Method

Participants and design

Eighty students (20 males, 60 females) at Tilburg University participated in this experiment for course credit. The experiment had a 2 (Certainty: Certain vs. Uncertain) × 2 (Responsibility: Self vs. Other) between-participants design.

Procedure and measures

Participants were invited to participate in a larger experimental session, of which the current study was a part. They were provided with essentially the same scenario as in Experiment 2.1, but two modifications were included. First, participants were told that they had decided to invest in either Stock B (as in Experiment 2.1) or in Stock A. Second, participants learned that the market has been *very* strong, providing investors in Stocks A and B a final profit of €3000 and €1900 respectively (whereas in Experiment 2.1, participants were told that the market was fluctuating and that their final profit was €1750). Since investing in Stock A provided a *maximum* of €3000 and Stock B a *maximum* of €1900, Stock A investors were *certain* that they had the highest value (they knew their final outcome was €3000 and that the alternative could not exceed €1900). On the other hand, though Stock B investors knew the outcome value of their own investment, they could not know the outcome value of the alternative investment (i.e., they were *uncertain*). Stock B investors knew that they had a final value of €1900 and that the alternative stock A had the potential of producing a profit of €3000, but they could not know the exact amount unless they decided to find out the outcome of the forgone investment[2]. In other words, uncertainty was introduced via the type of investment made. Stock A investors were always *certain* that they had the highest outcome value (compared to the alternative), and Stock B investors were *uncertain* of the value of their investment compared to that of the alternative. Thus, stock A investors learned that they had obtained €3000, and we were interested whether they wanted to know the

[2] In order to examine if participants did not expect the alternative stock to have the maximum profit as a default (e.g., earn €3000 or €1900), they were asked to estimate how much they believed they would have earned, had they decided to invest in the alternative stock. Stock B investors were expected to earn an average of 2086 Euros (*SD* = 369) and Stock A investors were expected 1776 Euros (*SD* = 391), $F(1, 76) = 13.06$, $p < .01$. This supports our assumption that participants did not expect the forgone investment to make the maximum profit.

value of Stock B. In the same manner, Stock B investors learned that they had obtained €1900, and we were interested whether they wanted to know the value of stock A. Information seeking was assessed using the same items as in Experiment 2.1 (α = .92).

Results and discussion

The results are shown in Table 2.2. They were analyzed using 2 (Certainty) × 2 (Responsibility) ANOVAs. Participants reported feeling more responsible in the "self responsibility" condition (M = 9.35, SD = .94) than in the "other responsibility" condition (M = 3.17, SD = 3.42), $F(1, 76) = 117.69$ $p < .01$, $\eta^2 = .04$. No other effects were found on the ratings of responsibility.

Table 2.2

Means and Standard Deviations of Responsibility and Information Seeking as a Function of Responsibility and Certainty (Experiment 2.2)

Dependent Variables	Certainty	Responsibility			
		Self		Other	
		M	*SD*	*M*	*SD*
Responsibility	Certain (Stock A)	9.45	(.88)	3.15	(3.45)
	Uncertain (Stock B)	9.25	(1.01)	3.20	(3.48)
Information Seeking	Certain (Stock A)	5.50	(3.12)	5.65	(2.71)
	Uncertain (Stock B)	7.25	(2.56)	3.85	(3.28)

Note. Values represent means on 11-point scales (0-10), with higher values indicating more responsibility and more information seeking.

Information seeking showed a different pattern. A main effect of responsibility was found, $F(1, 76) = 6.21$, $p < .01$, $\eta^2 = .07$, but this effect was qualified by a significant Certainty × Responsibility interaction, $F(1, 76) = 7.40$, $p < .01$, $\eta^2 = .08$. As indicated in Table 2.2, participants in the uncertain condition (i.e., those who had a final outcome of €1900 but could not know whether the forgone investment would have provided more) showed a stronger tendency to search for OFA when they were responsible for the decision, than when the uncle was responsible $F(1, 76) = 13.59$, $p < .01$, $\eta^2 = .15$. However, in the certain condition (i.e., when they ended with the maximum amount of €3000),

there was no effect of responsibility on the tendency to acquire information $F(1, 76) = .03$, *ns*. This second experiment supported our reasoning. The effect of responsibility on information seeking seen in Experiment 2.1 proved to be limited to situations in which there was uncertainty how well the obtained outcome compared to the forgone outcome.

Experiment 2.3

As suggested in the introduction, and consistent with the results of Experiments 2.1 and 2.2, individuals may seek information in order to reduce the intensity of their initial regret. A third experiment was developed to test whether regret mediates information search. Since regret is most likely to occur when one is a causal agent for the decision (Zeelenberg, van Dijk, & Manstead, 2000), only the "self – responsibility" condition was studied.

Method

Participants and design

Eighty-one students (31 males, 50 females) at Tilburg University volunteered to participate in this study. They were randomly assigned to one of the four conditions of the 2 (Certainty: Certain vs. Uncertain) × 2 (Market Condition: Strong vs. Weak) design.

Procedure and measures

Participants were approached individually at several locations on the university campus. They were provided with essentially the same scenario as in Experiment 2.2, but this time they were always responsible for making the investment. The market could be either in a *strong* condition (as in Experiment 2.2, Stock B investors ended with €1900 and Stock A investors with €3000) or *weak* (in the weak market condition, Stock B investors ended with €1400 and Stock A maintained its original value of €1000). By varying the market condition (i.e., Strong vs. Weak), we intended to manipulate the level of regret participants experienced. Stock B investors were expected to experience regret when the market was strong (they ended with €1900 and *suspect* that Stock A investors earned more), and Stock A investors were expected to experience regret when the market was weak (they maintain their €1000 and *know* that the alternative stock had a higher profit). The level of uncertainty was

manipulated by the type of stock. Since the outcome for Stock A is always clear (one always knows that one's final value is better [€3000] or worse [€1000] than the alternative), and the outcome for Stock B is more ambiguous (one cannot be sure if one's profit is better [€1400] or worse [€1900] than the alternative), Stock B investors were expected to be more likely to seek information, due to the situation's uncertainty. This tendency was expected to be particularly strong when the market was strong, since Stock B investors (with a final €1900) suspect that investing in Stock A would have provided them with a better outcome (up to €3000), and therefore have more reasons to regret their decision. After reading the scenario, participants indicated their regret for not choosing the alternative stock. Since this scenario involves positive and negative outcomes (investment profits may be better or worse than the alternative), other related emotions (disappointment, rejoicing, and pride) were measured, all on 11-point scales (0 = *not at all*, 10 = *very much*). Information seeking was measured with the same two items as in the previous experiments (α = .79).

Results

The results for the emotions and for information seeking are shown in Table 2.3. They were all analyzed using 2 (Certainty) × 2 (Market Condition) ANOVAs.

Emotions

First, we analyzed the effects on the emotions. For regret, market condition was found to have a significant main effect $F(1, 77) = 10.08$, $p < .01$, $\eta^2 = .11$, which was qualified by a significant Certainty × Market Condition interaction , $F(1, 77) = 17.36$, $p < .01$, $\eta^2 = .18$. When the market was weak, participants experienced more regret when they chose to invest their money in the Certain condition ($M = 5.00$), than when invested in the Uncertain condition ($M = 3.5$), $F(1, 77) = 5.34$, $p < .02$, $\eta^2 = .06$. When the market was strong, participants experienced more regret when they chose to invest in the Uncertain condition ($M = 3.95$), than when invested in the Certain condition ($M = 1.65$), $F(1, 77) = 12.89$, $p < .01$, $\eta^2 = .14$.

The same pattern was found for disappointment. The market condition had a significant effect on participants' disappointment, $F(1, 77) = 29.77$, $p < .01$, $\eta^2 = .27$, which was qualified by a significant Certainty × Market Condition

interaction , $F(1, 77) = 10.21$, $p < .01$, $\eta^2 = .11$. Also for rejoicing, we found a significant interaction, $F(1, 77) = 39.45$, $p < .01$, $\eta^2 = .33$, and two main effects, $F_{\text{market condition}}$ $(1,77) = 14.55$, $p < .01$, $\eta^2 = .15$, $F_{\text{certainty}}$ $(1, 77) = 6.70$, $p < .01$, $\eta^2 = .08$. For pride, we found a significant interaction $F(1, 77) = 10.79$, $p < .01$, $\eta^2 = .12$, and a main effect of Certainty, $F(1, 77) = 7.88$, $p < .01$, $\eta^2 = .09$. The pattern of results was as expected and can be seen in Table 2.3.

Table 2.3

Means and Standard Deviations of Feelings and Information Seeking as a Function of Market Condition and Certainty (Experiment 2.3)

Dependent Variables	Certainty	Market condition			
		Strong		Weak	
		M	*SD*	*M*	*SD*
Regret	Certain (Stock A)	1.65	(1.59)	5.00	(2.24)
	Uncertain (Stock B)	3.95	(2.24)	3.50	(2.03)
Disappointment	Certain (Stock A)	1.40	(1.27)	5.50	(2.35)
	Uncertain (Stock B)	3.42	(2.27)	4.50	(2.41)
Rejoicing	Certain (Stock A)	7.80	(1.67)	3.15	(2.03)
	Uncertain (Stock B)	3.71	(1.64)	4.85	(2.75)
Pride	Certain (Stock A)	6.75	(2.02)	4.60	(1.95)
	Uncertain (Stock B)	4.19	(1.47)	4.80	(2.06)
Information Seeking	Certain (Stock A)	4.30	(2.60)	5.40	(2.06)
	Uncertain (Stock B)	6.76	(2.01)	5.87	(2.20)

Note. Values represent means on 11-point scales (0-10), with higher values indicating more intense emotions and more information seeking.

Information Seeking

Next, we turned to the results concerning information seeking. A main effect of participants' level of certainty was found, $F(1, 77) = 8.76$, $p < .01$, $\eta^2 = .10$. This effect was qualified by a significant Certainty × Market Condition interaction, $F(1, 77) = 4.01$, $p < .05$, $\eta^2 = .05$. In order to learn the source of the interaction, simple main effects were analyzed. A significant simple main effect was found for the type of stock chosen when the market was strong, $F(1, 77) = 12.47$, $p < .001$, $\eta^2 = .13$. Participants showed a stronger tendency to acquire the

information when they invested in the Uncertain condition (M = 6.76), than when invested in the Certain condition (M = 4.30). These results replicate the findings in Experiment 2. No such effect was found when the market was in a bad condition, $F(1, 77) = .45$, *ns*.

To test our hypothesis that regret influences information seeking, we conducted a regression analysis using the different emotions (regret, disappointment, rejoicing, pride) as predictors. The results revealed an effect for regret, $\beta = .43$, $t(76) = 2.85$, $p < .01$. The more regret people experienced about not choosing the alternative stock, the more they wanted to seek information about this stock. Disappointment, rejoicing, and pride were not significant predictors of information seeking.

Mediation Analyses

The central question of this experiment was whether information seeking is caused by regret. The data presented so far are consistent with this explanation. However, to test whether regret mediated the effects on information seeking, a series of regression models were estimated (Baron & Kenny, 1986). The results are presented in Table 2.4.

The predictor variables in the models were the two manipulated factors (Certainty, Market condition) and their interaction (Certainty × Market). These factors were recoded using effect coding, with regret as the hypothesized mediator and the tendency to acquire information as the dependent variable. To examine mediation, we first regressed the dependent variable on the predictor variable (column 1). We then regressed the mediator on the predictor variable (column 2). Columns 1 and 2 simply replicate the ANOVAs reported earlier, showing that market condition affects regret (but not information seeking), level of certainty affects information seeking (but not regret), and the interaction affects them both. Finally, we regressed the dependent variable with the mediator (column 3). The results show that information seeking is affected by the inclusion of regret. The R^2 increases to .21 and the interaction looses significant. A Sobel test (Baron & Kenny 1986) revealed that the effect of the interaction is mediated by regret, $Z = 2.24$, $p < .02$. Taken together, this clearly indicates that regret has an important role on the decision to acquire information.

Table 2.4

Mediation Results of Experiment 2.3

	Dependent variable	Mediator	Mediation test
Predictor variables	Information Seeking (without mediators)`	Regret	Information Seeking (with Regret)
Certainty	.31**	.08	.28**
Market	-.02	-.31**	.07
Certainty × Market	.21*	.40***	.08
Regret	-		.31**
R^2	.14**	.26***	.21***

Note. Standardized Beta coefficients are reported. * $p < .05$, ** $p < .01$, *** $p < .001$

Discussion

The results of Experiment 2.3 supported the hypothesis that regret influences post-decision information search about the profits from the alternative stock. Interestingly, the market condition only affected regret, and not information seeking, and participants' level of certainty only affected information seeking, and not regret. However, the influence of the interaction on information seeking was mediated by regret. Furthermore, even though the two stocks induced different levels of regret under weak market conditions, there was no difference in the tendency to acquire information. However under strong market conditions, significant differences were found between investors with Stock B (with the uncertain OFA) and those with Stock A (with the certain OFA), both for regret and information seeking. In order to understand why we find information seeking when the market is strong but not when it is weak, we must first understand what the different market conditions (strong vs. weak) mean to investors with different investments (Stock A vs. Stock B).

It seems that under poor market conditions, Stock A investors (who gained nothing) *knew* that the alternative stock had a minimal profit of €400 (with a

total of €1400), and Stock B investors (who gained €400) did not really believe that the alternative stock could have had a higher profit (i.e., the poor market conditions were assumed to have damaged Stock A profits as they did those of Stock B, resulting in an amount close to the minimal €1000). Therefore, they had no reason to assume that information regarding the OFA would affect the way they felt. However, when the market was strong, while Stock A investors experienced lower regret (they ended with the highest profit), Stock B investors experienced higher regret as they suspected that the alternative stock would have offered a better outcome. Investors in stock B showed a stronger tendency to acquire information on the alternative stock, presumably hoping to be proved wrong.

In sum, not knowing whether a wrong decision was made might have an emotional cost, expressed by regret. This motivates people to seek information about the alternative, in order to either assess or eliminate the regret, and perhaps to learn from the experience. However, when it is clear that the OFA is better, the individual has no reason to believe that acquiring further information would decrease the level of regret or provide new insights. Therefore, investors in stock A showed a lower tendency to seek the information. This pattern of results replicates and extends the findings of Experiment 2.2.

Experiment 2.4

Experiment 2.3 showed that regret is related to post-decision information seeking. It may, however, be premature to conclude that regret causes this behavior, solely on the basis of this experiment. As noted before, we suspect that the experience of regret affects information seeking, particularly when it is not clear what kind of "news" will be discovered. We believe that the main purpose of seeking post-decision counterfactual information is to reduce, and hopefully to eliminate, regret. Experiment 2.4 further explores the effect of regret on information seeking, this time using a lottery scenario. Although the stock market scenario provided strong evidence for the influence of regret on information seeking, one could argue that learning was the primary motivation for acquiring the information, since the knowledge will allow individuals to improve their skills and odds in future investments. By using a lottery scenario, we intend to exclude this explanation. Seeking information in this

experiment has no clear economic explanation, since one cannot learn from knowing that one has missed an opportunity to win a prize. The information has no educational value (it cannot improve one's gambling skills), nor any economical value (participants were told that the lottery ticket was never sent).

Experiment 2.4 tests the hypothesis that experienced regret affects information seeking. By showing that the tendency to acquire information increases when regret is present and decreases when regret is absent, we will be able to assess our hypothesis regarding the role of regret on post-decision information seeking.

Method

Participants and design

Fifty students (29 males, 21 females) at Tilburg University volunteered to participate in this study. They were randomly assigned to one of the two conditions (missed prize: €2500 vs. €20). By using different amounts, we attempted to manipulate the level of regret participants would experience.

Procedure and measures

Participants were approached individually at several locations on the university campus. They were provided with a two-page questionnaire containing the scenario and the dependent measures. The scenario read as follows:

> You have been filling in lottery tickets for years now. A week ago you filled in your lottery ticket as usual, but forgot to send it in. This morning, you glanced at the newspaper and saw the numbers that won € 20 (€ 2500). You realized that some of these numbers were identical to the numbers you wrote on your unsent form.

After reading the scenario, participants indicated their regret for not handing in the ticket on 11-point scales (0 = *not at all*, 10 = *very much*). Next they read: "You are not sure, but you think that the form is in your parents' house." After this participants indicated the likelihood that they would call their parents and ask them to check the numbers on the form (0 = *not likely*, 10 = *very likely*).

Results and discussion

The results of the manipulation of the dependent variable on feelings of regret are shown in Table 2.5. As expected, participants reported more feelings of regret, and were more likely to seek information, when they suspected that they had missed an opportunity to win a higher prize.

Table 2.5

Means and Standard Deviations of Regret and Information Seeking as a Function of Missing an Opportunity to Win a Prize (Experiment 2.4)

Dependent Variables	Missed Prize						
	€ 2500		€ 20		*t*(48)	*p*	*d*
	M	*SD*	*M*	*SD*			
Regret	7.36	(2.67)	5.36	(2.07)	2.95	.005	.83
Information Seeking	7.96	(2.63)	6.28	(3.04)	2.08	.043	.59

Note. Values represent means on 11-point scales (0-10), with higher values indicating more regret and more information seeking.

The central question of this experiment is whether information seeking is mediated by experienced regret. We again used the Baron and Kenny (1986) procedure. We already found that the predictor variables (the size of the missed prize) influenced the mediator (regret), $\beta = .39$, $t(49) = 2.95$, $p < .01$, and the dependent variable (information search), $\beta = .28$, $t(49) = 2.08$, $p < .04$. To examine mediation, we regressed the dependent variable on both the predictor variable and the mediator and found that the predictor was no longer significant, $\beta = .11$, $t(48) = .830$, $p = .41$, while the mediator was, $\beta = .44$, $t(48) = 3.23$, $p < .01$. A Sobel test (1986) confirmed this, $Z = 2.17$, $p < .02$. Taken together, these results clearly show the role of regret in the decision to acquire information.

Experiment 2.5

Experiment 2.5 compares two additional motivations (in addition to the desire to reduce regret) that may be related to post-decision information search: the potential to use the information in the future, and the regret one anticipates when one suspects that an opportunity was missed. In this experiment we wanted to demonstrate that even though the potential to learn from the information or use it in the future is a reasonable reason to acquire information (Roese, 1994), the experience of regret (and not its anticipation) remains a strong motivation to acquire information, whether or not one can learn from it. Thus, in addition to information instrumentality, we predict that experiencing regret would induce a strong tendency to acquire information. Anticipated regret however, would not be a relevant factor in this process.

Method

Participants and design

Eighty-eight students (27 males, 61 females) at Tilburg University volunteered to participate in this study. They were randomly assigned to one of the four conditions of the 2 (Instrumentality: High vs. Low) × 2 (Discount: 10% vs. 60%) design.

Procedure and measures

Participants were invited to participate in a larger experimental session of which the current study was part. They were provided with a one-page questionnaire containing the scenario and the dependent measures. In the High Instrumental condition, the scenario read as follows:

> After having traveled a couple of weeks in Australia, you decided to stay at the luxury Kuala Beach Hotel during the last 10 days of your stay. When you arrived home, you thought that even though this was your first visit to Australia, you want to visit it again regularly.
>
> While checking your mail, you found a letter from your travel agent (apparently, it arrived just before you left for Australia); the letter invites you to become a member of the AHA (Australian Hotels Association). It mentioned that the AHA provides its members with up

> to 10% [60%] discounts when visiting hotels in Australia and covers virtually all hotels. The letter invited you to access the AHA (Australian Hotels Association) website in order to check the list of the hotels and the discounts they offer.

In the Low Instrumental condition, the second sentence of the scenario read: "this was your first and last visit to Australia because of the very long flight and the exhausting jetlag." The rest of the scenario was identical. After reading the scenario, participants indicated their regret for not having obtained a reduction card before flying to Australia (i.e., Experienced Regret), the extent they believed that they could use this reduction card in the future (i.e., Information Usability), and the extent they expect to regret the decision to seek information, assuming that they find out that the Kuala Beach Hotel is on the list of AHA discounted hotels (i.e., Anticipated Regret). All these measurements were assessed on 11-point scales (0 = *not at all,* 10 = *very much*). Next, information seeking likelihood ratings were obtained by asking participants to indicate the likelihood that they would actually access the AHA website to find whether the Kuala Beach Hotel is on the AHA discount list (0 = *not likely*, 10 = *very likely*).

Results

The results for regret (both anticipated and experienced), information usability, and information seeking are shown in Table 2.6. They were all analyzed using 2 (Instrumentality) × 2 (Discount) ANOVAs.

For Experienced Regret, a significant main effect was found for the Discount condition, $F(1, 87) = 10.60$, $p < .002$, $\eta^2 = .11$. Participants experienced significantly more regret when they missed a 60% discount ($M = 6.09$) than when they missed a 10% discount ($M = 4.34$). For information usability, a significant main effect was found for the Instrumentality condition, $F(1, 87) = 33.65$, $p < .001$, $\eta^2 = .28$. Participants considered the reduction card as more usable when they planned to visit Australia in the future ($M = 7.09$) than when they did not ($M = 4.47$). For Anticipated Regret, a marginally significant main effect was found for the Discount condition, $F(1, 87) = 3.72$, $p < .06$, $\eta^2 = .04$. Participants expected to regret their decision to seek the information more if they found out that they had missed a 60% discount ($M = 5.27$) than if they

had missed a 10% discount (M = 4.15).

Concerning information seeking, two main effects were found for both the ability to use the information in the future (Instrumentality) and the size of the discount being offered. There was a stronger tendency to seek information (M = 7.45) when it was perceived as having future utility than when it was not considered to be instrumental (M = 6.40), $F(1, 87) = 5.11$, $p < .02$, $\eta^2 = .05$. There was a stronger tendency to seek information when it was assumed that a large discount (60%) had been missed (M = 7.40), than in the case of a small discount (10%) (M = 6.45), $F(1, 87) = 4.26$, $p < .04$, $\eta^2 = .04$. The interaction was not significant.

Table 2.6

Means and Standard Deviations of Feelings (Experienced and Anticipated Regret), Information Usability and Information Seeking as a Function of discount and Instrumentality (Experiment 2.5)

Dependent Variables	Discount	Instrumentality	
		High	Low
		M *SD*	*M* SD
Experienced Regret	Large (60%)	5.45 (2.63)	6.72 (2.25)
	Small (10%)	4.54 (2.50)	4.13 (2.67)
Information Usability	Large (60%)	7.18 (1.68)	4.31 (2.83)
	Small (10%)	7.00 (1.44)	4.63 (2.21)
Anticipated Regret	Large (60%)	4.68 (2.55)	5.86 (3.01)
	Small (10%)	4.00 (2.65)	4.31 (2.58)
Information Seeking	Large (60%)	7.77 (1.84)	7.04 (2.45)
	Small (10%)	7.13 (1.69)	5.77 (2.54)

Note. Values represent means on 11-point scales (0-10), with higher values indicating more intense feelings, information usability, and more information seeking.

To test which motivations influence information seeking, we conducted a regression analysis using the different motivations (Experienced Regret, Information Usability and Anticipated Regret) as predictors. The results revealed an effect for Experienced Regret, $\beta = .31$, $t(87) = 2.75$, $p < .01$, and for

Information Usability, β = .41, $t(87) = 4.24$, $p < .001$. The more people experienced regret after missing a discount and the more instrumental the information seemed to be, the more they wanted to know whether the Kuala Beach Hotel was on the list of discounted hotels. Anticipated Regret was not a significant predictor of information seeking, β = -.02, $t(87) = -.19$, *ns*.

We again used the Baron and Kenny (1986) procedure. We have already seen that the predictor variables (the manipulation of the size of the discount and Information Instrumentality) influenced the mediators (Experienced Regret and Information Usability) and information search (See Table 2.7). Sobel tests (1986) revealed that both Experienced Regret, $Z = 2.01$, $p < .05$ and Information Usability $Z = -2.92$, $p < .01$ are significant mediators for information seeking.

Table 2.7

Mediation Results of Experiment 2.5

Predictor Variables	Dependent variable	Mediators		Mediation test
	Information Seeking (without mediators)	Experienced regret	Information Usability	Information Seeking (with Exp. Regret and Usability)
Discount	.21*	.329**	-.014	.132
Instrumentality	-.23*	.081	-.534***	-.049
Experienced regret				.262*
Information Usability				.384***
R^2	.10*	.11**	.28***	.24***

Note. Standardized Beta coefficients are reported. * $p < .05$, ** $p < .01$, *** $p < .001$

Discussion

Experiment 2.5 supports our reasoning regarding the importance of Experienced Regret in post-decision information search. Although learning from the information or using it in the future are important factors, Experienced Regret significantly contributes to the decision to acquire the information. Anticipated Regret, however, did not have any noticeable effects on post-decision information search.

General Discussion

The present results contribute to the understanding of post-decision information search by emphasizing the individual's dilemma: Should one seek information about outcomes of forgone alternatives or not? Seeking information may cause one to face a painful reality by realizing that an unfavorable decision was indeed made. But avoiding the information forces one to live with ongoing regret and uncertainty, associated with the thought that one could have done better if only a different decision had been made.

Experiment 2.1 showed that individual responsibility promotes the acquisition of post-decision information. Experiment 2.2 added the role of outcome uncertainty in information seeking, and showed that responsibility particularly affects information seeking when the outcome of a forgone decision is unknown and potentially better than the outcome of the decision that was made. The effect of responsibility on information seeking is consistent with the idea that regret plays a role in the willingness to acquire information. Experiments 2.3 to 2.5 explored the specific contribution of regret to the information-seeking process. Experiment 2.3 demonstrated that the decision to seek information is associated with the regret that people feel. In Experiment 2.4, we used a lottery scenario and showed that the need to alleviate the regret of *not* sending in the ticket is a sufficient motivation to seek non-instrumental information. Experiment 2.5 examined two additional motivations for seeking post-decision information, namely the potential to use the information in the future, and the level of regret one anticipates when finding out that an opportunity was missed. This experiment demonstrated that the intensity of regret one experiences influences the decision to acquire information regardless of the potential to use it in the future. On the other

hand, anticipated regret did not affect the decision.

Of course it is likely that post-decision information search, like many other complex psychological phenomena, may be over determined, actually stemming from a set of different mechanisms or processes that operate jointly. The desires to learn, improve ourselves or protect our self-esteem are all examples for such mechanisms. Each of these mechanisms or processes may be sufficient but not necessary causes for information search. This would imply that our studies, like any other, cannot definitively determine *the* cause of information search. What the present research has shown is that the need to reduce regret, particularly when there is uncertainty, plays an important role.

Interestingly, although individuals may have different motivations for seeking post-decision information, all these motivations share the same goal -- finding out that the best possible decision was made or that the best outcome was obtained. When people expose themselves to information, they acquire a criterion or standard to which they can compare their situation. Once the information is obtained, it serves as a benchmark for their desires and expectations (Baron & Hershey, 1988). Although seeking uncertain information might cause the individual to experience negative feelings when an as yet *incomplete* regret turns into a *definite* regret, it can also reduce this regret when decisions' outcome turns out not to be so bad after all. In contrast, information avoidance has a cost of itself, as regret and uncertainty are maintained and the opportunity to reduce it is lost. Therefore, even before the decision to acquire the information is made, individuals must weigh the cost of acting and exposing themselves to potentially negative information, and the cost of not taking action and maintaining the unpleasant feeling that a regrettable decision was made.

In the present chapter we addressed the question "when and why do we want to know?" focusing our research on the role of experienced regret in post-decision information search. We showed that the experience of regret promotes information acquisition, even when the information has no education or economical value. Importantly and counter-intuitively, this effect is more pronounced when one is likely to encounter negative information, since regret is an emotion that we typically experience when realizing or imagining that our

present situation would or could have been better. This implies that for individuals that decided to search the *potential negative information*, definite knowledge must considered to be less or at least equally (but not more) painful than the unpleasant feeling that is involved with ignorance. Consequently, this leaves these individuals with nothing to loose by seeking out negative information.

Chapter 3

When Ignorance is Not Bliss: How Feelings of Discomfort Promote the Search for Negative Information[3]

The famous English poet Thomas Gray (1742) suggested that ignorance is bliss and that it is folly to be wise, because knowledge may be emotionally painful. Is this true? Consider for example a person who practiced unprotected sex with a number of partners and is now considering taking an HIV test. Would ignorance still be blissful or would it be a haunting purgatory? As painful as it is to find out that one is HIV positive, not having this information is also not without costs. In the domain of potential negative outcomes, uncertainty is unpleasant (Loewenstein, 1994; Van den Bos & Lind, 2002; Wilson, Gilbert, & Centerbar, 2002). Thus, people might prefer to seek out potentially negative information, not because they welcome exposing themselves to an unpleasant experience, but because the state of ignorance is in itself disconcerting.

Nowadays, with the extensive developments of the internet, we have an abundance of available opportunities as well as an easier access to information about these opportunities (Schwartz, 2004). We can easily log on the internet and make investment decisions. We can also easily find out if our decision not to invest in a specific stock was in fact a big mistake. Knowing that we have missed an attractive opportunity is unpleasant and is likely to trigger feelings of regret and disappointment. The realization that an attractive action opportunity was missed is likely to influence our future judgments, decisions, and actions. For example, research on the "Inaction-Inertia" effect demonstrated in many choice situations that individuals are less likely to act on an attractive opportunity, if they know that they had missed a similar opportunity that could have guaranteed superior outcomes (Tykocinski & Pittman, 1998; Tykocinski, Pittman, & Tuttle, 1995; Zeelenberg, Nijstad, Van Putten, & Van Dijk, 2006). Instead, people will sometimes switch brands of

[3] This chapter is based on Shani, Tykocinski & Zeelenberg (2007).

consumer goods in an attempt to disassociate current opportunities from those which were already missed (Zeelenberg & Van Putten, 2005).

Weighed against the cost of knowing of a failure is the cost of ignorance. In general, people are uncertainty averse (Loewenstein, 1994; Van den Bos & Lind, 2002; Wilson, Gilbert, & Centerbar, 2002) and loss averse (Kahneman & Tversky, 1979). Hence, they are likely to experience discomfort when they believe that they have missed an opportunity. Without definite knowledge about what would have been, they are left to entertain the nagging thought that our circumstances could have been better if only they had acted on past opportunities. This is particularly true, in view of the affective forecasting literature which suggests that people tend to over-estimate the intensity and duration of the emotional distress they expect to experience as a result of negative events (Sieff, Dawes & Loewenstein, 1999; Wilson & Gilbert, 2003).

Recent research established that the experience of regret triggers post-decision information search (Shani & Zeelenberg, 2007). The authors argued that this search represents an attempt to gather information that would hopefully eliminate the possibility that an inferior decision was taken, thus relieving the nagging suspicion that one made a mistake. Ironically, by seeking information people expose themselves to information that may instead confirm their initial negative feelings, as they may find that indeed they could have obtained superior outcomes. Thus, for individuals who decided to search information that is potentially negative, obtaining definite knowledge about a forgone outcome (i.e., knowing for sure that the outcome would have been positive or negative), must seem less or at least equally (but not more) painful than the unpleasant emotional state that is associated with ignorance.

As both information seeking and information avoidance are emotionally costly, we sought to clarify which of the two burdens is heavier, and what are the factors that are involved in the decision to seek or avoid information. More specifically, we investigated whether definite knowledge about forgone outcome (e.g., knowing for sure that an attractive opportunity was missed or not) is indeed less painful than ignorance (i.e., not knowing whether an attractive opportunity was missed or not) and how the likelihood of uncovering this

information influences people's negative emotional state and the willingness to learn more about the missed opportunity.

Research on information gap theory had demonstrated that smaller gaps in knowledge increase curiosity as well as discomfort (Litman, Hutchins, & Russon, 2005; Loewenstein, 1994; Van de Ven, Zeelenberg, & Van Dijk, 2005; Van Dijk & Zeelenberg, 2007). The closer we are to "knowing" the more curious we feel and the more dissatisfied with the state of ignorance. A high likelihood that an attractive opportunity was missed resembles a smaller information gap, compared to a situation in which an information search is not likely to ascertain that one had missed an attractive opportunity. Thus, we expected that one's feelings and willingness to acquire information will be influenced by the probability that the search will uncover unpleasant information; low probability was expected to elicit less discomfort associated with remaining ignorant and consequently a lower tendency to seek out information. In contrast, high probability that one had missed an attractive opportunity was expected to elicit more discomfort and a stronger tendency to seek information.

Experiment 3.1

In Experiment 3.1 participants were asked to imagine that they had missed taking part in a lottery because they forgot to send in their already filled in lottery form. The probabilities of having missed the prize as well as the size of the prize were manipulated. Although missing an opportunity to win a large amount of money may be more distressing than a loss of a small amount, past research had demonstrated that when evaluating the importance of probability and payoff in near-future events, probabilities are evaluated as more important than payoffs (Sagristano, Trope, & Liberman, 2002; Van Dijk & Van der Pligt, 1997). Thus, we expected that the likelihood (i.e., probability) of finding out that an opportunity was missed had greater effect on experienced discomfort and willingness to search information about the lottery than the actual payoff.

Method

Participants and design

Eighty students (62 females, M_{age} = 23 years) at Ben-Gurion University volunteered to participate in this study. The participants were randomly assigned to one of the four conditions of the 2 (Missed Prize: 500 NIS vs. 500,000 NIS[4]) × 2 (Probability: High vs. Low) factorial design.

Procedure and measures

Participants were approached individually at several locations on the university campus. They were given a questionnaire containing the scenario and the dependent measures. The scenario read as follows (values for high probability and large prize appear in parentheses):

> You have been filling-out lottery tickets regularly. A week ago you filled out your lottery ticket as usual, but forgot to send it in. This morning, you glanced at the newspaper and noticed the numbers that won the 500 NIS (500,000 NIS) prize.
>
> You realized that two (five**)** out of the six lottery numbers were identical to the numbers you had on your unsent form. You were not sure regarding the rest of the numbers and the lottery ticket is in your house.

After reading the scenario, participants asked to indicate how much discomfort they would feel in this situation, thinking that they may find out that an opportunity to win the lottery was missed (0 = *not at all*, 10 = *very much*). Next, participants indicated the likelihood that they would approach information that would disclose whether the numbers on their unsent form are indeed the winning numbers (0 = *not likely*, 10 = *very likely*).

Results

The data were analyzed using 2 (Missed Prize) × 2 (Probability) ANOVAs. The results are shown in Table 3.1. Participants reported feeling more discomfort when the probability to find that an opportunity was missed was high (*M* =

[4] At the time of the study, equivalent to $111 and $111,111 respectively

6.85, *SD* = 2.31) than when it was low (*M* = 5.35, *SD* = 2.15), as is revealed by a main effect of probability, $F(1, 76) = 8.79$, $p < .01$, $\eta^2 = .10$. A similar pattern was found for information seeking. Participants showed a stronger tendency to acquire information regarding the missing number(s) when the probability of finding out that an opportunity to win the lottery was missed was high (*M* = 6.97, *SD* = 2.88) than when it was low (*M* = 5.20, *SD* = 3.58), $F(1, 76) = 5.72$, $p < .05$, $\eta^2 = .07$. The magnitude of the prize one might have missed (i.e., Missed Prize) and its interaction with probability had no effect for feelings of discomfort and information seeking.

Table 3.1

Means and Standard Deviations of Feeling of Discomfort and Information Seeking as a Function of the Missed Prize and Missing Probability (Experiment 3.1)

Dependent Variables	Missed Prize	Probability			
		Low		High	
		M	*SD*	*M*	*SD*
Feeling Discomfort	500 NIS	5.33	(2.03)	6.76	(2.11)
	500,000 NIS	5.36	(2.33)	6.94	(2.57)
Information Seeking	500 NIS	4.47	(3.81)	6.90	(2.77)
	500,000 NIS	6.00	(3.21)	7.05	(3.08)

Note. Entries are means on 11-point scales (0-10), with higher values indicating more intense feelings and more information seeking.

To test the hypothesis that feelings of discomfort associated with ignorance trigger information seeking, we conducted a regression analysis. The results revealed that the more discomfort people felt with the thought of having missed a gain, the more they wanted to know whether the rest of the numbers on their unsent form are the winning numbers, $\beta = .35$, $t(76) = 3.36$, $p < .01$.

Mediation Analysis

The central question of this experiment is whether information seeking is mediated by feeling discomfort. To test for mediation, a series of regression models were estimated (Baron & Kenny, 1986). The results are presented in

Table 3.2. Because one of the requirements of testing mediation effects is that the independent variables significantly affects the dependent variable in the absence of the mediator, the probability variable served as a sole predictor in this model, with feeling discomfort as the hypothesized mediator and the tendency to acquire the information as the dependent variable. We found that probability predicted discomfort feeling (column 1). Next, we found that probability predicted information seeking (column 2). Finally, we found that information seeking is affected by feeling discomfort and not by probability (column 3). A Sobel test (1982) revealed that the effect of probability on information seeking is mediated by experienced discomfort, $Z = 2.01$, $p < .05$.

Table 3.2

Mediation Results of Experiment 3.1

	Mediators	Dependent variable	Mediation tests
Predictor variables	Feeling Discomfort	Information Seeking (no mediators)	Information Seeking (with feeling discomfort)
(Missed) Probability	.32**	.26*	.16
Feeling Discomfort			.30**
R^2	.10**	.07*	.15**

Note. Standardized Beta coefficients are reported. * $p < .05$, ** $p < .01$

Discussion

The results of Experiment 3.1 supported the hypothesis that feeling discomfort mediates the tendency to search information regarding the lottery missing number(s). The results confirm that feeling discomfort is influenced by the initial probability of winning the lottery. The magnitude of the prize had no significant effect on either feeling discomfort or the willingness to acquire information. It seems that when confronted with potential negative information implying that an opportunity was missed, the likelihood (i.e.,

probability) that an opportunity was indeed missed weighed heavier than the actual sum that was lost. These findings are consistent with the findings of Van Dijk and Van der Pligt (1997) who showed that the experience of disappointment is mainly determined by the probability of undesirable outcome, rather than by the magnitude of desirable outcome. In Experiment 3.2, we sought to replicate this result in a lab setting.

Experiment 3.2

Participants in this experiment learned that they had just missed an opportunity to participate in a lottery with either a high or low probability of winning. They were asked to decide whether they wanted to wait for information concerning the lottery outcome (i.e., finding out whether they could have won the lottery if they had participated in it).

Method

Participants and design

Seventy three students at Tilburg University participated for course credit. They were randomly assigned to one of the two conditions (Probability: High vs. Low).

Procedure and measures

Participants entered the lab and were told that they would participate in several computer based experiments. After being assigned to a cubicle, the experimenter said: "When the experiment begins, you will be offered by the program to participate in a lottery. It is my responsibility to make sure that you understand that this lottery is no longer running." The experimenter then explained that the reason for the lottery cancellation is that all prizes were already given out, and that in order to avoid unpleasant incidents where people claim prizes that are not available, he had to make sure that they understood it. Participants were told that because the lottery program was still installed, they will be asked to insert their participant number (either 3 or 78), which also serves as their lottery number and wait for the lottery results. The experimenter made it clear to the participants that they did not have to wait

for the lottery results and that they could call the experimenter in order to quit the waiting period and proceed to the next screen.

After the introduction, the experimenter started the program and the experiment begun. Participants read:

> ***Computer screen 1*:** "Please insert your Participant Number. You will use this number at the end of the experiment to collect your winnings."
>
> ***Computer screen 2*:** "You are participating in a lottery in which you can earn 20 to 500 Euros. You are participant number 3 (78) out of 80. None of the participants in the current session won any prizes yet. This means that you have 1:78 (3) chance to win a prize!!! Soon you will be able to know whether you have the winning number."

After inserting their Participant Number and reading the instructions, participants completed a filler task. Next they read:

> ***Computer screen 3*:** "It takes the program 3 minutes to find out whether your Participant Number is the lottery winning number."

The participants then had to decide whether they want to wait for the lottery results (3 minutes), or call the experimenter in order to continue with the experiment. The waiting time (Maximum 180 seconds) was our dependent variable.

Results and discussion

The time participants had to wait for the lottery results was 180 seconds. This time period gave the participants 179 seconds to withdraw from the waiting period (when they decided to ignore the information). Figure 3.1 shows the non-parametric Kaplan-Meier survival functions; steps indicate a decision to quit the waiting process. The survival function describes when people stopped waiting during 180 seconds as a function of the probability level of having the winning number. As can be seen in the figure, participants in the Low

Probability condition dropped out at a greater pace than those in the High Probability condition. The log-rank test for the equality of the survival functions was significant, $x^2(1, N = 73) = 6.67$, $p < .01$.[5]

The relatively low withdrawal rate of participants in the high probability condition illustrates how determined they were to find out conclusive information, regardless of the waiting period and the fact that the lottery was no longer playing. In sum, Experiments 3.1 and 3.2 provided a strong support to our hypothesis regarding the willingness of individuals to acquire information, even when it has a high potential to be negative.

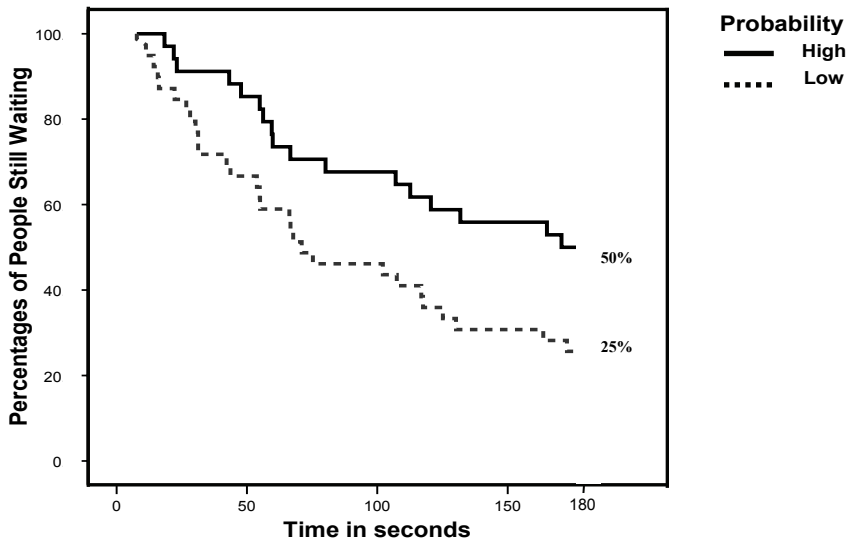

Figure 3.1
Kaplan – Meier Survival Estimates for Participants Still Waiting for Information regarding the Lottery Results, by Probability (Experiment 3.2).

[5] Note that this difference between conditions remains significant when only looking at the number of participants that withdrew from the waiting session before the 180 seconds were over. When probability was high, 17 out of 34 withdrew, but when probability was low, 29 out of 39 withdrew, $x^2(1, N = 73) = 4.62$, $p = .03$.

Experiment 3.3

As suggested earlier, we believe that discomfort drives people to gather information in the hope that this information would allow them to relinquish the nagging possibility that they had missed an attractive opportunity. Paradoxically, the same high likelihood of winning the lottery, which makes ignorance uncomfortable, also increases the chances that the search will uncover that the opportunity was indeed missed. Thus the initial goal of finding relief is unlikely to materialize without assuming that for individuals who decided to search this information, definite knowledge is experienced as less or at least equally, but not more painful than the unpleasant feeling that is associated with continued ignorance.

Certainty, even when it is afforded at the cost of ascertaining negative or painful knowledge has a positive value. Individuals usually expect to feel better under certain conditions than uncertain ones (Wilson, Centerbar, Kermer, & Gilbert, 2005). If definite negative knowledge would have left people feeling worse then we should expect them to try to avoid information that has high probability of proving negative. However, according to our analysis and the findings of Experiments 3.1 and 3.2 this is not the case. In Experiment 3.3 the hypothesis that when negative information is expected, definite negative knowledge is in fact less-aversive than uncertain ignorance, is tested directly.

Method

Participants and design

Sixty students (35 females, M_{age} = 22 years) at Tilburg University volunteered to participate in this study. Participants were randomly assigned to one of the three levels of missing an opportunity to win a lottery (Probability: High vs. Low vs. Certain) between-participants design.

Procedure and measures

Participants were approached individually at several locations on the university campus. They were provided with a lottery scenario similar to the one used in Experiment 3.1. In addition to the *low* or *high* probabilities of finding out that an opportunity was missed, one third of the participants were provided with definite knowledge that they had the winning ticket but failed to

send it in[6]. Thus, we were able to compare individuals' discomfort due to uncertainty to discomfort due to having certain negative knowledge.

After reading the scenario, participants were asked to indicate to what extent they would feel discomfort, regret, disappointment and a tendency to ruminate in this situation (0 = *not at all*, 10 = *very much*). These items were highly related (α = .90) and were therefore averaged to create a general index of psychological discomfort.

Results and discussion

The results were analyzed using a one-way ANOVA and are reported in Table 3.3. There were significant differences in the intensity of psychological discomfort, $F(2, 59) = 4.70$, $p < .05$. Participants reported significantly more discomfort when the probability of finding out that a prize was missed was high rather than low, which could be expected. Most importantly, however, participants indicated more discomfort in the high probability condition than in the condition in which they had certain knowledge that an opportunity to win the lottery was missed.

Table 3.3

Means and Standard Deviations of the Negative Feeling Index as a Function of Probability (Experiment 3.3)

Probability Condition	*M*	*SD*
Low Probability	5.86 a	1.64
High Probability	7.40 b	1.40
Certainty	6.26 a	2.10

Note. Ratings were made on 10-point scales, with endpoints labeled *not at all* (0) and *very much* (10). Means with different subscripts differ at $p < .05$, LSD post-hoc tests.

These results confirm the expectation that high probability of finding out that an opportunity was missed is more disconcerting than entertaining the same possibility with a lower probability. More interesting, however, is the fact that

[6] Participants were told that the prize in this lottery was €250.

knowing for sure that one had missed an attractive opportunity is experienced as less aversive than high probability uncertain knowledge. These results are consistent with our assumptions concerning the role of negative affect in motivating information search. That is, people seek post-decision counterfactual information simply because it feels better than being ignorant and *suspecting* that this information is negative.

General discussion

We demonstrated how the probability of uncovering negative information influences the decision to pursue this information. We focused our research on the emotional costs of avoiding and obtaining the negative knowledge. Counter-intuitively we predicted and found that individuals are willing to search and expose themselves to information that may confirm a negative inkling, particularly under those circumstances where confirmation is highly likely. We explained these findings by demonstrating that the negative emotional burden of uncertainty is particularly heavy when it is highly likely that an attractive opportunity was missed, and in fact – it is less emotionally costly to know for sure even when the news one discovers, is unfavorable. It seems that individuals are willing to search the potentially negative information, not because they enjoy exposing themselves to painful knowledge, rather because it is frustrating not knowing.

Of course, there are other motives that may encourage post-decision information search. The desires to learn, improve ourselves or protect our self-esteem are all examples for such possible motives. The dilemma underlying these different motives is, however, the same - to know or not to know, which would be more painful? Our findings suggest that when expecting negative feedback, the unpleasant feelings associated with being ignorant are far more painful than the negative feelings associated with definite knowledge. Thus wanting to learn or boost the self-esteem even at the cost of searching potential negative information, should be interpreted not only by the desire to improve ourselves or our feelings *despite* the emotional costs of knowing, but rather *because of* the disconcerting feelings associated with being ignorant.

One explanation why ignorance is experienced more aversively than definite negative knowledge may have to do with definite knowledge allowing

individuals a mental closure that shields them from further rumination. This would enable psychological immune systems to decrease the impact of negative information by activating psychological defenses. Indeed *immune neglect* studies, a major source of the impact bias, provide further support for this reasoning by demonstrating psychological immune systems which accelerate people's recovery from negative experiences (Gilbert, Driver-Linn, & Wilson, 2002; Gilbert, Pinel, Wilson, Blumberg, & Wheatley, 1998). Being unaware of their immune system, these processes allow individuals to recover from their negative emotional state by means of rationalization and sense making (Gilbert et al., 1998; Wilson & Gilbert, 2003). In this sense, post-decision information search may be interpreted as a sense making technique by which individuals attempt to cope with their negative emotional state, for example by eliminating the possibility that a regrettable decision was made (Shani & Zeelenberg, 2007), or by providing a mental closure that immediately activates the immune system. In this respect, the decision to search negative information is just another step in the processes of reducing dissonance and feeling better. This argument is also consistent with previous explanations for the lack of evidence of information avoidance in the literature. As stated: "Avoidance of further dissonant information merely hinders any increase in the existing dissonance. It does not, however, decrease the dissonance itself" Frey's (1986, p.70).

It could be argued that the use of scenarios with no actual monetary consequences limits the generalizability of our findings. Although real losses and real gains typically enhance stronger emotions than non-losses and non-gains would (Idson, Liberman, & Higgins, 2000), it is important to bear in mind that it is people's initial expectation for supportive or non-supportive information that intensify the need to reassure themselves that their situation is optimal. As long as the comparison is made between one's current states to even worse scenarios, real money would probably intensify emotions and the search of information, but unlikely to change directions (i.e., information avoidance), as it is the probability that counts rather the absolute monetary of the loss.

In the present chapter, we demonstrated how the probability of encountering negative information influences the decision to obtain this information. We focused our research on the emotional costs of avoiding and obtaining the

negative knowledge. We found that individuals are willing to expose themselves to information that may confirm their negative feelings, particularly when they are likely to encounter one. We explained this allegedly masochistic behavior by demonstrating that individuals are willing to search the potential negative information, not because they enjoy exposing themselves to the unpleasant information, but because it is frustrating not knowing this information.

In his novel "The curious incident of the dog in the night-time," Mark Haddon (2003, p. 215) expressed this frustration from the point of view of Christopher, an autistic 15-year-old boy:

> And its best if you know a good thing is going to happen, like an eclipse or getting a microscope for Christmas. And it's bad if you know a bad thing is going to happen, like having a filling or going to France. But I think it is worst if you don't know whether it is a good thing or a bad thing which is going to happen.

Chapter 4

Choosing Ignorance: Why do People Avoid Useful Information?[7]

> Yet ah! why should they know their fate?
> Since sorrow never comes too late,
> And happiness too swiftly flies.
> Thought would destroy their paradise.
> No more; where ignorance is bliss,
> 'Tis folly to be wise.
> *Thomas Gray* (1891)

Although the phrase "ignorance is bliss" is often used as an indication of the serenity associated with unawareness, Thomas Gray's poem actually argues that it is not *always* "folly to be wise". The true meaning of the poem offers that ignorance is blissful *only* when someone is currently comfortable with their ignorance (Andreas, 2000). Thus, the conclusion is that ignorance *can* be bliss, but the question however remains *when* this is the case.

In the present research we investigate how situational factors can temporarily suppress information search. More specifically, we hypothesize that when potential negative information may interfere with individuals' future activities, information avoidance will occur. Although it may seem obvious to predict information avoidance when one expects to learn negative information, the empirical literature provides little evidence for the existence of such an effect (Frey, 1986) and sometimes even finds the opposite pattern. For example, after making an investment decision people tend to search for information regarding forgone alternatives, in the hope of reassuring themselves (Shani & Zeelenberg, 2007). They do this even if chances are high that the information will be

[7] This chapter is based on Shani, Zeelenberg & Van de Ven (2007).

painful. Furthermore, curiosity (Loewenstein, 1994) and uncertainty aversion (Van den Bos & Lind, 2002) are powerful human motives that usually stimulate people to search for information.

The absence of empirical support for information avoidance is surprising and calls for a further investigation of factors that may stimulate the avoidance of information. Before turning to our studies that were designed to answer this call, let us first address the relevance of this research and to explain our reasoning for when and why we expect information avoidance.

The importance of understanding information avoidance

During the course of our lives, we avoid useful information at many instances. For example, we are sometimes reluctant to check our mailbox when we expect a large bill. When we receive mail from the credit card company we leave the envelope closed for a few days. Or, as a personal example, one of us does not like to analyze the results of an experiment just before the weekend starts. There are times though, when avoiding information may have severe consequences.

Consider a person who engaged in unprotected sex with multiple partners and is now considering whether or not to take an HIV test. As painful as finding out that one carries the disease may be, avoiding this information is not without costs. In addition to the aversion to living in uncertainty (Loewenstein, 1994; Van den Bos & Lind, 2002), there are important other goals relevant. First, when infected, one may want to take all possible measures to slow down the development of the disease. Second, one may be motivated to decrease the chance of infecting others. Yet, a large number of HIV carriers live among us who are unaware of the virus. Understanding the circumstances under which people prefer to postpone or even avoid receiving this information, may have fundamental implications for disease control and prevention.

As mentioned earlier, the literature provides only little evidence for the existence of information avoidance. Frey (1986) mentions at least two reasons why selective information avoidance is often weaker than information search. First, avoiding unpleasant information hinders the functioning of an effective

cognitive system as one cannot learn from it to improve future decisions. Second, although avoiding negative information does not increase existing unpleasant feelings, it surely does not decrease it

People may have good reasons to engage in information search; to learn from the information (Roese, 1994), to regulate negative emotions (Shani & Zeelenberg, 2007), to avoid unpleasant uncertainty (Van den Bos & Lind, 2002), to satisfy curiosity (Loewenstein, 1994; Van de Ven, Zeelenberg, & Van Dijk, 2005; Van Dijk & Zeelenberg, 2007), or just because knowing sometimes feels better than remaining uncertain (Sieff, Dawes, & Loewenstein, 1999; Wilson & Gilbert, 2003). In fact, information search is such a strong drive that people are even willing to pursue information that is not useful for their decision at hand (Bastardi & Shafir, 1998; Tykocinski & Ruffle, 2003). The absence of empirical support for information avoidance is surprising and calls for a further investigation regarding why and when people might avoid useful information.

Why and when can we expect information avoidance?

The most obvious answer to the question why people may sometimes want to avoid information is because the information is threatening and expected to be painful. It is not nice to find out that your situation would have been better had you only chosen an alternative option (e.g., Zeelenberg 1999). It is painful to learn that you did not win the lottery because you failed to send in your lottery ticket, that your partner is being unfaithful, or that you are infected with a sexually transmittable disease. However, we think that it is not just the painfulness of this information because prior research found that decision makers nevertheless looked for information. Perhaps avoiding knowledge relies more on the *circumstances* under which it is obtained and not so much on how painful it precisely is. In other words, whereas people in general are expected to search for reassuring information even at a risk of finding the opposite, some circumstances may temporarily decrease the *ability* or *motivation* to cope with negative information. Consequently, people may prefer to temporarily avoid information and maintain their uncertainty.

As noted earlier, avoiding potential negative information may be emotionally costly because uncertainty may enhance negative feelings which people wish

to alleviate (Shani & Zeelenberg, 2007). Individuals' ability and motivation to cope with the suppression of negative affect and its effects on health issues were lately discussed under the domain of affect regulation, stretching two different viewpoints (see for a review, Larsen & Prizmic, 2004). Whereas one perspective offers that suppressing negative feelings takes effort which may interfere with adaptive functioning. Another perspective offers that inhibiting negative emotional expression may be beneficial under some situations, depending for example on whether the inhibition has long or short-term consequences. Both these perspectives fit our view concerning the power of circumstances on individuals' motivation to temporarily prolong nagging uncertainty. For instance, although maintaining uncertainty may be emotionally costly for individuals who are forced to hold on to their negative feelings, it may also serve the goal of maintaining future events pleasurable and having wonderful memories of these wonderful events. In other words, carefully choosing when to expose oneself to potential negative information can be seen as an effective affect regulation strategy, which enables individuals to regulate their negative and positive feelings in situations that involve both. This idea receives further support from Loewenstein's (2006, p. 704) suggestion that "information serves not only as an input into decision-making, but is a source of pleasure and pain in its own right".

As a further demonstration to the power of circumstances on individuals' assessment and ability to cope with uncertainty, Loewenstein (1987) established the relevance of *anticipation* for positive or negative consumption. For instance, when expecting a positive event (obtaining a kiss from a movie star) anticipation became a source of utility for individuals, who were willing to pay more to shortly delay the experience. Yet when expecting a negative event (receiving an electric shock), anticipation turned into a burden and the participants were willing to pay more to get the experience over with immediately, instead of delaying it. Thus, people may differ in their motivation and perhaps in their ability to cope with uncertainty, depending on whether they anticipate positive or negative events. Similarly, positive and negative feelings associated with uncertainty have shown to influence the desire to prolong or immediately resolve uncertainty. For example, people may prefer to prolong a pleasurable feeling of uncertainty that follows a positive event, such as receiving an unexpected gift but finding it difficult to make sense of the text on the card (Wilson, Centerbar, Kermer, & Gilbert, 2005). On the other hand,

they like to quickly relieve a negative feeling that arises from the possibility of making a former inferior decision (Shani & Zeelenberg, 2007).
Different from situations in which resolving uncertainty would clearly improve or deteriorate one's negative or positive feelings, our research examines information search in situations where negative information could be found (e.g., potentially failing an exam or being infected with HIV) when expecting a positive unrelated event (e.g., an upcoming weekend, a vacation, or a wedding). In such emotionally complex situations, people cannot infer whether maintaining or resolving uncertainty would mitigate their negative feelings, until the uncertainty is resolved. Finding negative information might ruin the positive event, but so does ruminating about the uncertainty if one does not look for the information. Following this, people not only have to balance the costs of resolving uncertainty versus having potential painful knowledge, but also to evaluate the moment of information search and its potential to influence the upcoming event.

Returning to our opening poem (Gray, 1891); because happy moments are rare and short lived ("happiness too swiftly flies") and it is only a matter of time before we have to face painful truths that may distort our happiness ("sorrow never comes too late") or even force rumination ("thought would destroy their paradise"). And because, temporarily avoiding the information is not likely to change or improve the quality of the information avoided. We expect people to postpone searching the information until after the event. Thus, when negative information would interfere with people's short term goals they may strategically avoid or delay the information search. For example, if your brother's wedding takes place in the coming weekend, you might avoid learning your HIV test results to be sure that you do not end up destroying the pleasure of the weekend. Although looking for uncertain information can have positive effects, the fear of finding out that one is infected would definitely hinder the ability to enjoy the wedding.

In the present chapter, we investigate how the anticipation of pleasant events (an upcoming weekend, a trip to Paris, a wedding) encourages people to temporarily delay the search of painful information until after the pleasant events. We conducted four experiments to study how the circumstances under which the information will be obtained are related to information avoidance. In our experiments, participants were awaiting potential negative

information and had to decide between resolving uncertainty now versus later. We manipulated the enjoyment that was associated with the upcoming event (it could be pleasurable or neutral). We predicted and found that when a pleasurable event was expected, participants choose to avoid the information because this information could lower the pleasure that is associated with the upcoming event. The results supported our expectations, even when the participants indicated to be highly curious regarding the nature of the information.

Experiment 4.1

Experiment 4.1 investigated whether students are reluctant to check their exam results when these may interfere with a pleasurable event. The specific pleasurable event is the upcoming weekend. Because students generally tend to like weekends (party time) better than weekdays, we expected that they would be less likely to inspect their exam results on a Friday than on a Tuesday. This in order to prevent the possibility of ruining their weekend, if they would find out that they failed their exam.

Method

As part of the university service, students could check their exam results by entering the university website a few hours after finishing the exam (only in case of multiple choice exams). We compared information search with respect to the results of two exams, one that took place on a Tuesday (Social Psychology, 80 exam participants) and one that took place on a Friday (Health Psychology, 147 exam participants). Information avoidance was coded as the proportion of students that checked the correct answers within the two days that followed the exam. Data was collected during the 7 days after the exam.

Results and discussion

The results are shown in Table 4.1. As expected, a larger proportion of students preferred to check the exam results during the first two days when the exam was taken on a Tuesday, than when the exam was taken on a Friday, $x^2(1, N = 227) = 9.91$, $p = .002$, $\Phi = .21$.

Table 4.1

Willingness to Check Exam Results Before and After Two Days Depending on the Day the Exam was Taken in Experiment 4.1

Day of Exam	Result Checked		
	Within Two Days	After Two Days	Total
Friday	111 (75.5%)	36 (24.5%)	147
Tuesday	74 (92.5%)	6 (7.5%)	80

A stronger indication for information avoidance was demonstrated by comparing the results "check day" only for the 45 students who took both social and health psychology classes (i.e., Tuesday and Friday respectively). Showing that the same students that searched their test results on a Tuesday, chose to avoid the results on a Friday would further support our reasoning that an upcoming pleasurable time plays a large role in the decision to postpone information search.

As expected, the same students were more likely to enter the university website to check their results within the two days that followed the exam, when results were available on a Tuesday (43 out of 45), than when available on a Friday (37 out of 45), $x^2(1, N = 90) = 4.05$, $p = .044$, $\Phi = .21$.[8] These results clearly demonstrate the power of circumstances on individuals' reluctance to search information. Experiment 4.2 was designed to provide further insights on the underlying process.

[8] Strictly speaking, x^2 tests are not appropriate because these data violate the requirement that each participant provides only one data point. Analyzed with the appropriate Wilcoxon-Mann-Whitney test, the results would still be significant, (whole sample, $Z = -3.41$, $p = .002$; subsample, $Z = -2.00$, $p = .045$. We chose to report, x^2 tests because they compare the proportion of students that checked within two days in the two conditions, whereas the Wilcoxon-Mann-Whitney uses the ranking of information search during the whole period.

Experiment 4.2

Earlier we hypothesized that people avoid information that may interfere with an upcoming pleasurable event. This may happen for example if finding out that one failed the exam, would drive people to ruminate about this failure which in turn might reduce the enjoyment of the event. However, at the same time uncertainty is unpleasant and may lead to rumination as well (Martin & Tesser, 1986). In Experiment 4.2 we investigated whether knowing for certain that one had failed an exam versus being uncertain about this information, elicits stronger ruminative thoughts when a pleasurable event is anticipated (a weekend in Paris), than when a relatively normal event is anticipated (a regular weekend).

Method

Participants and design

Forty-five students at Tilburg University volunteered to participate in this study. They were randomly assigned to one of the two conditions (Weekend: Paris vs. Regular).

Procedure and measures

Participants were approached individually at several locations on the University Campus. They were provided with a one-page questionnaire containing the scenario and the dependent measures. The Paris version of the scenario added to the text (Manipulation appears in parenthesis):

> Imagine that you have just taken a tough qualifying exam. It is the end of the fall quarter, you feel tired and run-down and you are not sure whether you passed the exam. In case you failed, you have to take the exam again in a couple of months – after the Christmas holidays.
>
> This Friday, at 19:00h, you arrive home from the university. You are looking forward to the next morning (since you are supposed to fly to Paris for the weekend) when your weekend starts. A few minutes after you entered your house, your friend calls and says that the exam results are now available online.

After reading the scenario, participants indicated how much they expected to think about the exam during the weekend when they would avoid the information ("thinking that you may have failed"), and when they would have checked the information and found out that they had failed ("knowing that you have failed the exam") (0 = *not at all,* 10 = *very much*).

Results

The results are shown in Figure 4.1. A mixed factorial design with Type of Weekend (Regular versus Paris) as a between-subjects variable and the two rumination questions about *thinking* or *knowing* to fail the exam as a within-subjects variable, revealed a significant crossover interaction effect, $F(1, 43) = 6.26$, $p = .016$, $\eta^2 = .12$. This is how the interaction looks like. While having an ordinary weekend, participants expected to think more of the possibility that they may have failed the exam if they had decided *not to check* the exam results ($M = 7.35$, $SD = 2.05$), than when decided to search the information and found that they indeed failed the exam ($M = 6.52$, $SD = 1.92$). However, while spending a weekend in Paris the opposite pattern was found. Participants expected to think more of the failure when assuming that they had decided to search the information and found out that they indeed failed the exam ($M = 7.18$, $SD = 1.70$), than if they had decided *not to check* the exam results ($M = 6.18$, $SD = 2.77$).

Discussion

This experiment supports the reasoning that when expecting a pleasurable event (a weekend in Paris) people are extra cautious with information that might damage the pleasure associated with the event. How much people expected to think of a failure when seeking and avoiding the information provides further indication to the damage that this information may cause, and the costs of having definite knowledge. The results suggest that an evaluation process for the negative effects of having definite knowledge versus remaining ignorant is made. In this evaluation process, the pleasure associated with a vacation in Paris could be lessened by the constant reminder of a failure. Therefore, remaining ignorant is preferred. However,

when the upcoming weekend was a regular weekend, people expected to ruminate more about the uncertainty if they would not check the results. Thus, one would do better to search for the information.

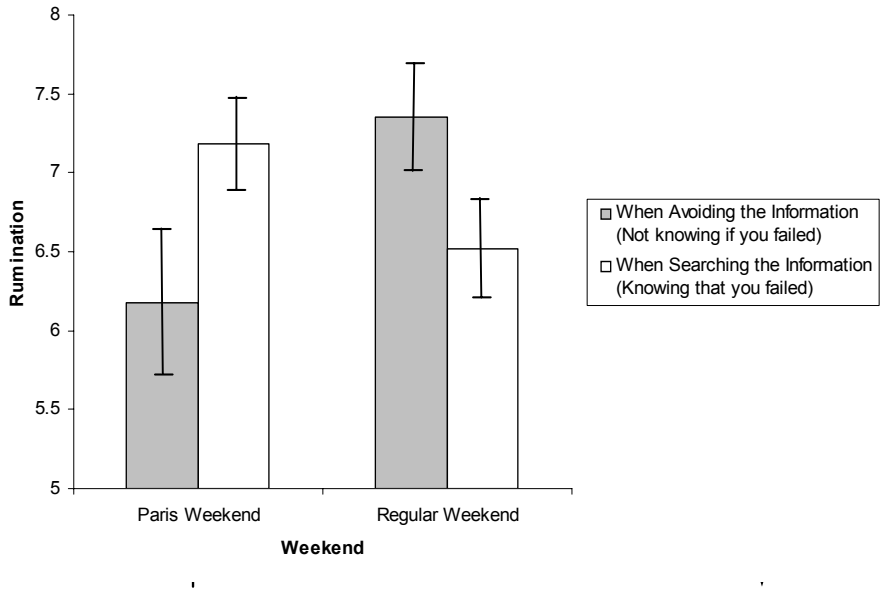

Figure 4.1

Means of rumination about failing the exam when searching the information (knowing that you have failed), and avoiding the information (not knowing whether you failed) as a function of the Weekend in Experiment 4.2. Error bars represent 1 standard error of the mean.

Experiment 4.3

As suggested in the introduction, and consistent with the results of Experiments 4.1 and 4.2, people may avoid information that could negatively influence their future plans. Experiment 4.3 further investigates this process. We predicted that people prefer to postpone receiving HIV test results until after a weekend with a wedding of a brother, than when no event was planned for the weekend. This behavior was expected to be mediated by a desire to have the weekend as pleasurable as possible.

Method

Participants and design

Thirty-two students at Tilburg University participated in this study. They were randomly assigned to one of the two conditions (Weekend: Wedding vs. Regular). Participants were invited to participate in a larger experimental session of which the current study was part. They were provided with a one-page questionnaire containing the scenario and the dependent measures. The scenario read as follows:

> Because you had multiple experiences of unsafe sex with a number of partners during the last 2 years, you decided to take an HIV test. Now you have to schedule a visit to the clinic to obtain the test results (they never give these over the phone). The clinic is open from Monday to Friday and you must have an appointment within the next 2 weeks. Today is Wednesday. You are thinking whether or not to pick up the test results before this weekend.

In the Wedding condition, participants additionally read: "Your brother is getting married this Saturday." After reading the scenario, participants indicated the extent to which they thought that the upcoming weekend justifies delaying the appointment with the clinic until after the weekend, and how important it was for them to have this weekend as pleasurable as possible (0 = *not at all*, 10 = *very much*). With these questions, we intended to assess whether a wedding weekend (compared to a normal weekend) is indeed evaluated as more important and therefore more valuable to protect from potential negative information. Next, the likelihood of information seeking was assessed by asking "Would you prefer to know your HIV test results before or after the weekend?" (-5 = *definitely before*, 5 = *definitely after*). Finally, the participants indicated whether they would choose to check the test results *before* or *after* the weekend.

Results and discussion

The results are shown in Table 4.2. As expected, participants thought that the wedding justifies delaying information search and that it was important to have the weekend as pleasurable as possible. More importantly, on a wedding

weekend participants were more likely to postpone collecting their HIV test results until after the weekend than on a regular weekend, as also revealed by their choices.

Table 4.2

Means and Standard Deviations of the Dependent Variables per Weekend Condition in Experiment 4.3

Dependent Variables	Type of Weekend							
	Wedding		Regular		*t*(31)	*p*	*d*
	M	*SD*	*M*	*SD*			
Weekend justifies delaying appointment with clinic	6.25	(2.54)	4.12	(2.60)	2.33	.026	.89
It is important to have this weekend as pleasurable as possible	8.25	(1.48)	5.37	(1.85)	4.83	.001	1.71
Information Seeking	1.37	(3.28)	-2.87	(2.70)	3.96	.001	1.41
# of participants postponing test results until after the weekend	9 (out of 16)		3 (out of 16)		$x^2(1, N=32) = 4.80$	.028	

Note. Values represent means on 11-point scales, with higher values indicating more relevance attributed for the weekend, and the preference to postpone information search until after the weekend.

The central question of this experiment is whether wanting to have an upcoming event as pleasurable as possible mediates information avoidance. We tested for mediation following the method of Baron & Kenny (1986). The expected mediation was found (see Figure 4.2 for a graphical display) and confirmed with a Sobel (1982) test, Z = -3.02, p = .002. Taken together, Experiment 4.3 confirmed the hypothesis that wanting to have an upcoming event pleasurable mediates the tendency to delay information search. Although the timing of collecting the HIV test result could not change the test outcome, our participants preferred to postpone the meeting with the clinic and to only collect the results after the weekend.

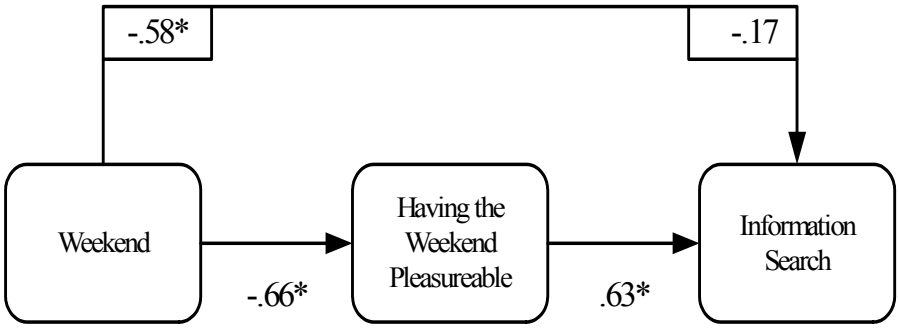

Figure 4.2
Mediation Results of Experiment 4.3
Note. Standardized Beta coefficients are reported. * $p < .001$

Experiment 4.4

Experiment 4.4 introduces an additional motivation (in addition to the importance of having a pleasurable weekend) that may be related to information search, namely how curious people are to know their test results. Curiosity is known to be highly related to information search (Litman, Hutchins, & Russon, 2005; Loewenstein, 1994; Shani & Zeelenberg, 2007; Van Dijk & Zeelenberg, 2007). In the current experiment we wanted to examine whether despite the presence of curiosity, the possibility that the information would negatively influence an upcoming event would be a strong motivation to avoid information. In other words, we wanted to test whether having a pleasurable event outweighs the desire to satisfy curiosity.

We induced different levels of curiosity by providing different reasons for the HIV test. We assumed that having an HIV test after touching a potentially infected drug-needle would elicit more curiosity than testing yourself for HIV while donating blood, because the former is clearly riskier and invites more attention. Thus, curiosity was induced via a manipulation of the risk of being infected. Although we expected an increase in curiosity, we did not expect an increase in information search in the wedding weekend.

Method

Participants and design

One hundred students at Tilburg University volunteered to participate in this study. They were randomly assigned to one of the four conditions of the 2 (Weekend: Wedding vs. Regular) × 2 (Risk Factor: Junkie Needle vs. Blood Donation) design.

Procedure and measures

Participants were invited to participate in a larger experimental session of which the current study was part of. They were provided with a one-page questionnaire containing the scenario and the dependent measures. The scenario read as follows:

> A few months ago, while you were sitting in the Vondelpark[9] you accidentally touched and were stabbed by a dirty injection needle that probably belonged to a junkie. Therefore, you decided to have an HIV test. Now you have to go to the clinic to obtain the test results (they never give these over the phone). The clinic is open from Monday to Friday and you must have an appointment within the next 2 weeks. Today is Wednesday. You are thinking whether or not you will pick up the test results before this weekend.

In the Blood Donation condition, participants read that they were offered to test themselves for HIV while they were donating blood, and in the Wedding condition participants read that their brother was getting married on the upcoming Saturday (as in Experiment 4.3). The rest of the scenario was identical. We used the same measurements as in Experiment 4.3. In addition, participants were asked to report how curious they were to learn their HIV test results (0 = *not at all*, 10 = *very curious*).

Results and discussion

The results of the manipulations on the dependent variables are shown in Table 4.3. They were analyzed using 2 (Weekend) × 2 (Risk Factor) ANOVAs.

[9] The Vondelpark is a large park in Amsterdam that is regularly visited by drug addicts.

For the question whether the upcoming weekend justifies delaying the appointment with the clinic, the type of weekend was found to have a significant main effect. Participants thought that a wedding weekend was more likely to justify delaying information search (M = 5.08, SD = 3.08), than a regular weekend (M = 3.38, SD = 3.00), $F(1, 96) = 7.69$, $p = .007$, $\eta^2 = .07$. The same pattern was found for the importance of having the weekend pleasurable. Participants thought that it was more important to have the wedding weekend as pleasurable as possible (M = 8.04, SD = 1.66), compared to a regular weekend (M = 6.42, SD = 2.99), $F(1, 96) = 11.23$, $p = .001$, $\eta^2 = .10$. The interactions for both the weekend justifiability to postpone information search, $F(1, 96) = 0.66$, *ns*, and the importance of having it pleasurable, $F(1, 96) = 1.86$, *ns*, were not significant.

Table 4.3

Means and Standard Deviations of the Dependent Variables per Weekend Condition and Risk Factor in Experiment 4.4

Dependent Variables	Type of Weekend				
	Risk Factor	Wedding		Regular	
		M	*SD*	*M*	SD
Weekend justifies delaying appointment with clinic	Junkie Needle	5.36	(3.30)	3.16	(3.22)
	Blood Donation	4.80	(2.88)	3.60	(2.81)
It is important to have this weekend as pleasurable as possible	Junkie Needle	8.16	(1.67)	5.88	(3.03)
	Blood Donation	7.92	(1.68)	6.96	(2.92)
Curiosity	Junkie Needle	9.16	(1.28)	9.32	(0.94)
	Blood Donation	8.00	(1.82)	7.24	(2.57)
Information Seeking	Junkie Needle	-0.28	(4.42)	-3.68	(2.79)
	Blood Donation	0.12	(4.07)	-2.56	(2.97)

Note. Values represent means on 11-point scales, with higher values indicating more relevance attributed for the weekend, and the preference to search information only after the weekend.

Next, we turned to the results concerning curiosity and information avoidance. For curiosity, only a main effect was found for the risk factor. Participants were more curious to learn their HIV test results after touching a junkie needle

(M = 9.24, SD = 1.11), than after donating blood (M = 7.62, SD = 2.23), $F(1, 96) = 21.04$, $p < .001$, $\eta^2 = .17$. However, for information avoidance only a main effect for the weekend type was found, demonstrating a stronger preference to avoid the HIV test results (i.e., check it only after the weekend) when a wedding was planned (M = -.08, SD = 4.21), than when a regular weekend was coming up (M = -3.12, SD = 2.91), $F(1, 96) = 17.50$, $p < .001$, $\eta^2 = .15$.

The participants also chose between having their test results before or after the weekend (Table 4.4). A hierarchical log-linear analysis of these choices yielded a significant Weekend Type × Risk Factor × Information Search interaction, $G^2(4, N = 100) = 18.68$, $p < .001$. The three-way interaction qualifies the two-way interaction between Weekend Type and Information Search, $x^2(1, N = 100) = 17.82$, $p < .001$, $\Phi = .42$. No other effects were significant. The results were in agreement with our hypotheses. On a wedding weekend, more participants preferred to have their HIV results after the weekend than on a normal weekend. They were willing to do so in order to reduce the possibility of ruining the weekend. Although the reason for having the HIV test (Junkie Needle vs. Blood Donation) yielded different levels of curiosity, this had no effect on information seeking. This demonstrates the power that situational factors can have on our willingness to search or avoid potential painful information.

Table 4.4

Willingness to Check HIV Test Results Before and After the Weekend per Weekend Condition and Risk Factor in Experiment 4.4

	Risk Factor					
	Junkie Needle			Blood Bank		
	Before Weekend	After Weekend	N	Before Weekend	After Weekend	N
Wedding	12 (48%)	13 (52%)	25	13 (52%)	12 (48%)	25
Regular	23 (92%)	2 (8%)	25	21 (84%)	4 (16%)	25

To examine which motivations influence information avoidance we conducted a regression analysis using the different motivations (curiosity and having a pleasurable weekend) as predictors (Figure 4.3). Because curiosity was not a

significant predictor of information avoidance, β = -.16, *t*(99) = -1.73, *ns*, we abandoned further testing of curiosity as a potential mediator following the method of Baron & Kenny (1986). Having the weekend as pleasurable as possible showed partial mediation for information avoidance (see Figure 4.3). A Sobel test (1982) confirmed the mediation, *Z* = -2.23, *p* = .002.

Experiment 4.4 supports our reasoning that when expecting both potential negative feedback and a positive event; people prefer to temporarily avoid information in order to have the upcoming event as pleasurable as possible. Although curiosity is known for its strong association with information search, it did not predict information seeking in this study. Having the weekend as pleasurable as possible on the other hand, was highly relevant for making this decision, emphasizing the importance of situational factors for information avoidance.

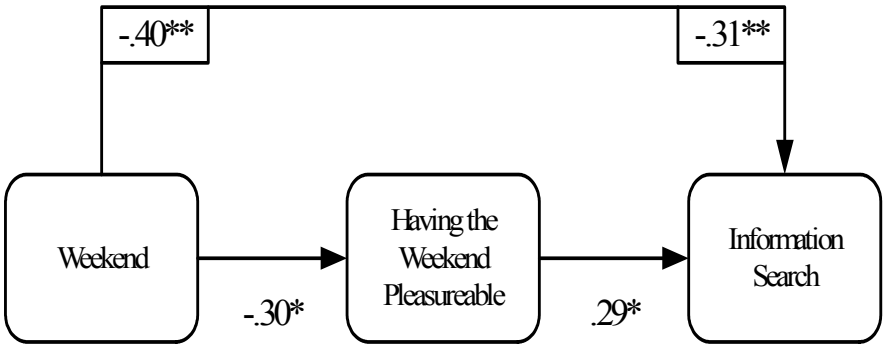

Figure 4.3
Mediation Results of Experiment 4.4
Note. Standardized Beta coefficients are reported. * $p < .01$, ** $p < .001$

General Discussion

The present experiments demonstrate how the anticipation of pleasurable events might cause information avoidance. Although people usually prefer to expose themselves to potential painful information in hope to alleviate uncertainty (Shani & Zeelenberg, 2007) or to satisfy curiosity (Loewenstein, 1994), when the information might negatively interfere with future pleasurable

events, they prefer to temporarily maintain their ignorance by avoiding the information. Such avoidance occurs in spite of powerful motives such as curiosity and uncertainty aversion.

Experiment 4.1 demonstrated that students having their exam results available on a Tuesday preferred to check their grades immediately. Yet, when having their exam results available on a Friday (before a weekend starts), many preferred to check their grades after the weekend, suspending information search. Experiment 4.2 provided indications for an evaluation process of whether or not one should search potentially painful information before leisure-time. We found that visiting Paris while *knowing* that one had failed an exam seemed worse and expected to elicit stronger ruminative thoughts compared to only *suspecting* a failure. During a regular weekend, the opposite pattern existed, as *expecting* a failure was considered to be more distressing and to elicit stronger ruminative thoughts than *knowing* to have failed. Experiments 4.3 and 4.4 demonstrated how desiring a pleasurable weekend mediates the decision to avoid information, even when people were highly curious regarding the quality of this information (Experiment 4.4).

The current research contributes to our understanding of information avoidance by demonstrating how events that may seem unrelated to the negative information (a weekend, a vacation, and a wedding), attenuate the search of this information which a) is not likely to be changed or modified within the waiting period and b) it is only a matter of time before the information is made known. Knowing that people are rather ineffective in predicting their emotions, overestimating the impact of future events on their emotional reactions (Sieff et al., 1999; Wilson & Gilbert, 2003), and remembering that during our course of lives we anticipate painful and pleasurable experiences on a regular basis, the idea of having people self-regulate by only exposing themselves to information that they are able to tolerate at a given point in time, is both inspiring and distressing.

It is inspiring because it provides an indication to how sophisticated people are in their attempts to maintain a healthy and a stable system that is capable of handling negative information. Thus, people constantly try to evaluate their abilities to overcome negative life experiences, and to carefully select the moments they look for potentially negative information. This way, they opt for

optimal circumstances to cope with this negative information. At the same time they seem to "remember" that it is also important to protect and enjoy positive events (Loewenstein, 1987).

It is distressing because people's attempts to maintain a healthy and a stable system may be costly when the information avoided is essential for immediate survival. Although people may derive utility just by anticipating positive life experiences (Loewenstein, 1987) and uncertainty that follows positive events is found to prolong positive moods (Wilson et al., 2005), they adjust better to dangers and better able to learn when they are not euphoric (Wilson & Gilbert, 2003) or uncertain (Berlyne, 1954). In other words, a quick response is often needed to handle the massive amount of threats we are often confronted with in order to react on them.

Because people tend to overestimate the impact of future events on their emotional reactions, this problem becomes most obvious when circumstances that may "justify" information avoidance, last for a period of time that is long enough to prevent a quick and effective reaction to a given threat. Under this definition, we may find individuals that decided to test themselves for HIV only *after* returning from a long and a wild trip in a far and exotic country, or only *after* they have met the right partner. This may increase the "costs" individuals may pay for temporary protecting themselves, for example by increasing the risk of being infected or the possibility of infecting others. The attempt to temporarily protect ourselves from negative information may seem to be particularly absurd, especially when recognizing that our emotional reactions are not as intense, and do not last as long as we expect (Wilson & Gilbert, 2003). Under these circumstances, *temporary* avoiding the information may have severe consequences not only by increasing the risk for contagion, but also by hindering our ability to learn from our emotional experiences.

Although our research clearly demonstrates that the anticipation for positive events can cause information avoidance, a few limitations must be stated. First, it is possible that the expectation for a pleasurable event also elicited positive feelings in our participants, feelings that they were motivated to maintain. Although we can assume that expectations for negative information (e.g., suspecting to fail an exam, being infected with HIV) "overshadowed" the time period that preceded the pleasurable event, future research should clarify

if instances of positive feelings were experienced or involved in the decision to prolong uncertainty. Second, our experiments discuss situations in which uncertainty is quick to be resolved if not looked for immediately. It would be interesting to test whether in situations in which the time interval is extended (e.g., a long trip in a far country) people still prefer to maintain uncertainty. Third, in the current project we demonstrated how people avoid information that may interfere with anticipated pleasurable events. Future research may want to clarify whether avoidance is limited to only pleasurable future events or can be extrapolated to any information that may interfere with current or future activities. A person might for example avoid collecting HIV test results when the person is studying for an important exam.

Conclusions

In the present chapter, we addressed the question why people sometimes avoid useful information, focusing our research on complex situations in which both positive events and potential negative feedback are anticipated. We found that when potential negative information may interfere with people's future plans by mitigating the pleasure that is associated with their coming events, information avoidance is found. This behavior was consistent, even when the information avoided was not likely to be changed or improved within the waiting period; it was only a matter of time before the information made known; and when individuals reported to be curious regarding its content. Although the literature provides evidence for individuals' preference to search potential negative information, we show that people may ignore this information despite its potential to alleviate negative feelings. These results confirm Gray's (1891) conviction that positive moment in life should be protected, and that sometimes it is "folly to be wise". The current chapter takes us one step further in understanding information search, by increasing our awareness to the circumstances under which people decide to avoid information, and as a consequence fail to learn from it. This knowledge can serve as a powerful tool in controlling the dangerous growing ignorance around us, and in increasing our awareness to our own flaws.

Chapter 5

Different Ways of Looking at Unpleasant Truths How Construal Levels Influence Information Search[10]

Imagine that a few days after your wedding you hear that the photographer you hired for the big event may have ripped you off. How interested would you be in finding out whether or not you were financially ripped-off on your wedding day? Certainly, on the one hand knowing this information may spoil your memories of that wonderful day. On the other hand not knowing this may "drive you crazy", by forcing rumination and unpleasant feelings about the possibility that you were indeed ripped off. Our research examines the need to know more about *such* unpleasant truths (e.g., the money that you lost to the photographer). More specifically, we argue that the need to uncover potentially unpleasant truths, which are obviously peripheral features of the central event (e.g., your wedding day), depends on whether the event is represented in abstract or in concrete terms. First we will explain our unpleasant truths search paradigm (i.e., SUT - Search for Unpleasant Truths) and its underlying assumptions (see also Shani, Tykocinski, & Zeelenberg, 2007; Shani & Zeelenberg, 2007). Then we will consider construal level theory (e.g., Trope & Liberman, 2003) to introduce our specific hypotheses about the conditions for the search of potentially unpleasant information, and the mediating processes that are involved.

Why would we expose ourselves to unpleasant information?

One of the most useful traits most species share is curiosity (for a review, see Loewenstein, 1994). Humans, who are usually considered to be superior species with strong cognitive and social proclivities, may have more than a few motivations for wanting to increase knowledge. The desires to learn, improve ourselves, regulate our moods and feelings or protect our self-esteem are all

[10] This chapter is based on Shani, Igou & Zeelenberg (2007).

examples for such motives. Roese (1994) for example, described two possible counterfactual comparisons, which emphasize such motives: upward, in which a person compares a current situation to an alternative scenario with a better outcome, and downward, in which a person compares a current situation to an alternative with a worse outcome. While downward comparison may lead to positive feelings, upward comparison might summon unpleasant feelings when the current situation is compared to better alternatives. The question then is whether these are affective goals or learning goals that underlie this information search process.

Recently we have developed an information search paradigm, which explains the search for potentially unpleasant truths. As we have demonstrated before, this form of information search is a function of affective goals and unrelated to self-improvement purposes (Shani et al., 2007; Shani & Zeelenberg, 2007; Van Dijk & Zeelenberg, 2007). For example, thinking that an opportunity to win a large amount in a lottery was missed because one failed to send in the ticket, or that one missed out on a large sale's offer, may drive people to search information that discloses whether or not an opportunity was really missed (Shani et al., 2007; Shani & Zeelenberg, 2007). Apparently, people are willing to seek out unpleasant information not because they welcome exposing themselves to unpleasant experiences, but because a lack of knowledge is in itself disconcerting (Gneezy, List, & Wu, 2006; Loewenstein, 1987; Loewenstein, 2006; Wilson, Gilbert, & Centerbar, 2002), particularly when negative outcome is anticipated (Rottenstreich & Hsee, 2001).

More specifically, with our SUT paradigm this type of information search serves a short-term affective goal by reducing the irritating uncertainty about a negative outcome. Ironically, by seeking information people expose themselves to knowledge that may instead confirm their expectations as they may find out that indeed they could have obtained superior outcomes. Such information search occurs even when the probability to encounter unpleasant truths, increases (e.g., the likelihood of finding out that an opportunity to win a lottery was missed) (Shani et al., 2007). Thus, under some circumstances a lack of knowledge is exceptionally frustrating, forcing people to ruminate about what might have been. Such rumination can only end when the abovementioned affective goal is reached, for example by finding out that one obtained superior outcomes, or alternatively when understanding that this goal is unlikely to be

reached (Carver & Scheier, 1998; Martin & Tesser, 1996). Without a doubt, definite knowledge can be less-aversive than unpleasant uncertainty even when one finds out that indeed one's situation is inferior (Sieff, Dawes, & Loewenstein, 1999). What exactly are the conditions that facilitate or hinder the search for potentially unpleasant information? To answer this question, we need to understand the features of these situations.

As our earlier research suggests (Shani et al., 2007; Shani & Zeelenberg, 2007) an important feature of our SUT information search paradigm consists of a peripheral unpleasant aspect within an overall event. Returning to our opening example, thinking that one was ripped-off (the unpleasant aspect) may be a powerful source of information search, yet at the same time, this aspect is clearly a peripheral feature of the whole wedding event. As described above, we argue that uncertainty about an outcome is associated with a negative feeling, which we are motivated to reduce by searching for the potential unpleasant information. To gain additional insights into the conditions under which this unpleasant information occurs, we need to understand how these situations are cognitively represented. We offer that construal level theory (CLT; Trope & Liberman, 2003) provides the means to understand this matter.

Mental representation of events and the need to know

CLT (Liberman, Trope, & Stephan, 2006; Trope & Liberman, 2003) offers that the same event can be represented in abstract or concrete ways. The theory distinguishes high level construals (HLC) from low level construals (LLC). HLC are abstract representations of an event, which include an event's central, primary features but lack specific contextual information. In contrast, LLC incorporate the peripheral and secondary features of an event. These representations consist of more specific, context information, and are thus more complex, unstructured and more sensitive to contextual cues than HLC. With regard to actions, high-level construals consist of their superordinate goals or, in other term, information that explains "why" this action is performed (aspects of desirability). Low-level construals on the other hand, entail subordinate goals and "how" (feasibility) aspects of the situation (Vallacher & Vagner, 1989).

Psychological distance determines whether high or low level construals are formed. With an increase in psychological distance, individuals are more likely to form a high-level construal of an event. If, however, the event is psychologically near, low-levels construals are more likely to emerge. Variables that influence psychological distance to events or actions are their temporal distance, their social distance, their spatial distance and their hypotheticality. For example, if an event is temporally remote (e.g., the wedding is long over), individuals form a high-level construal of this event (i.e., they focus on the purpose of wedding). In contrast, the same event is represented more in terms of low-level features (e.g., the bill of the professional photographer) when it is temporally near (e.g., yesterday).

How do construal levels influence affect-driven information search within our SUT search paradigm? On a general level, we argue that different construals of the overall event may change the affective need that underlies the search for the potentially unpleasant information. Specifically, given that individuals search the information because not knowing the facts would "drive them crazy", the question is whether a variation of the levels with which the event is construed changes (i.e., lessen) this affective experience, and the corresponding affective goal.

Liberman, Trope, and Stephan (2006) argue that increase or decrease of affect depends on whether the affective experience is central to the situation or not. If affect corresponds to central aspects of the situation, high-levels construals are expected to increase affect. If, however, affect corresponds to peripheral aspects of the situation, high-levels construals are expected to reduce affect. Trope and Liberman (2000, Study 5) for example, demonstrated how high levels construals may consist of either affective or cognitive aspects of an event (film), depending on whether the central goal (watching the film) was affective (getting into a good mood) or cognitive (learning the topic). They found that temporal distance (leading to high level construal) increased interest in cognitive values versus affective values of the movie when the goal was cognitive (i.e., informativeness), but decreased cognitive values and enhanced affective features when the goal was affective (i.e., funniness).

Based on this analysis we suggest that when an event consists of powerful but peripheral affective information (being ripped-off is subordinate to the

importance of the wedding day), low-levels construals of the event elicit stronger affective responses to the suspicion that one may have been ripped-off, which will increase the likelihood of searching for the potentially unpleasant information. In contrast, high-levels construals of this negative event are expected to weaken negative affective responses and their corresponding affective goal, consequently attenuating the tendency to engage in this information search process.

In sum, we argue that when events consist of peripheral negative experiences (e.g., thinking that one was ripped-off), adopting a high-level construal which consists of the central aspects of the event (e.g.," I just got married to my adorable husband, why care about the money for the photographer"), would draw less attention to the peripheral features of the event (e.g., the potential loss of money) and the corresponding affective goal (i.e., the reason for this information search). In contrast, low-level construal of such events increases attention to peripheral details of the situation ("I may have been ripped off"), a narrowed perspective that would enhance individuals' affective responses ("not knowing about this drives me crazy") and the affective goal to engage in this information search. In other terms, not being able to ebb away their negative feelings should increase the search for information that may hopefully alleviate the negative affective arousal.

Overview of the Experiments

Willingness to seek out potentially unpleasant information was examined in five studies. In this series of studies we manipulated the adoption of high and low construal levels of events in various ways, and examined whether construal levels influence information search. In Experiments 5.1 we directly manipulated how abstractly individuals construe the scenario information ("why" versus "how" perspective). In Experiment 5.2 we manipulated construal levels via spatial distance ("near" versus "distant"). In Experiment 5.3 we manipulated construal levels by varying social distance ("self" versus "other"), and we examined whether the information search effect is mediated by the level of discomfort that results from not knowing more about the event. In Experiments 5.4 and 5.5, beside manipulating construal levels ("why" versus "how" and spatial distance, respectively), we experimentally varied

participants' beliefs in the instrumentality of knowing the information for the attenuation of negative feelings.

Experiment 5.1

Experiment 5.1 was designed to provide first indications about the effects of construal levels on information search. To manipulate levels of construals we used a modified version of the *why* (i.e., High Level), and *how* (i.e., Low Level) construal level manipulation used by Freitas, Gollwitzer, and Trope (2004).

Method

Participants and design

Thirty-eight students from Tilburg University (25 women, mean age 20.5) volunteered to participate in this study. They were randomly assigned to one of the two construal-levels conditions (How vs. Why)

Procedure and measures

Participants were invited to a lab session of which the current study was part of. They were provided with a questionnaire containing the scenario and the dependent measures. The scenario read as follows:

> You got married yesterday. Congratulations!!! Tonight while sitting with a friend, he asked you how much you paid the company that videotapes the wedding. When you told your friend that you paid €2000, he said that he *think*s that the same company worked at his brother wedding a week ago and he *think*s that his brother paid only €1800. Your friend offers to check how much exactly his brother paid.

After participants read the scenario, we induced High (vs. Low) construal levels of this event. We asked the participants to imagine their wedding day and to visualize themselves acting in a certain way. In the High Level construal condition participants were asked to describe in detail *why* (for what reasons) they would act this way, and in the Low-Level construal we asked them to indicate *how* (in what way) they would act. Before answering our questions we asked the participants to assume that it was not possible to reclaim the potential loss of money, thus searching the information had no future use.

Information seeking was assessed via the four items (α = .80): the likelihood of encouraging the friend to uncover the exact amount that his brother paid, explicitly asking the friend not to disclose this information (reversed item), (0 = *very unlikely,* 10 = *very likely*), and the extent one wants to *search* and *avoid* (reversed item) this information (0 = *not at all,* 10 = *very much*).

Results and discussion

As expected, participants who adopted a High-Level construal were less interested in uncovering whether or not they were ripped-off by the filming company (M = 4.76, SD = 1.81), compared to participants who adopted a Low-Level construal, (M = 6.14, SD = 1.93), $t(36) = -2.26$, $p = .029$, $d = .73$ These results suggest that construal levels influence the decision to acquire information and provide first behavioral indications for the validity of our assumptions: individuals with a High-Level construal focus on the central features of the situation (e.g., getting married), and show a lower tendency to search peripheral information. Individuals with a Low-Level construal focus to the greater degree on the peripheral features of the situation (e.g., money lost to the photographer), thus show a stronger tendency to search the potentially unpleasant information.

Experiment 5.2

In the current experiment, we sought to replicate the construal level effect and to extend the results of Experiment 5.1, using a spatial distance manipulation (i.e., psychological distance) and a different scenario (bypassing an opportunity for a stock profit). Because missed opportunities normally evoke intense negative feelings (Roese, & Summerville, 2005), we considered a rising stock which one failed to invest in, to be an unpleasant piece of information. As the scenario referred to a very specific situation in which one failed to act, more information about this situation does not provide useful knowledge for the future. Therefore, this information is relatively peripheral and irrelevant. Going beyond Experiment 5.1, in this study we examined the effects of construal levels on information search by manipulating psychological distance. In order to manipulate psychological distance, we varied spatial distance of the event (Henderson, Fujita, Trope, & Liberman, 2006). Nevertheless, we expected participants in the spatial near condition to consider this affective feature of

the event (e.g., bypassing an opportunity for profit) and engage in the information search process. However, participants in the spatial distant condition were expected to be less influenced by the affective feature of the missed opportunity, and to show a lower tendency to search information.

Method

Participants and design

Seventy-four students from Tilburg University (46 women, mean age 20) volunteered to participate in this study. They were randomly assigned to one of the two Spatial Distance ("Tilburg Steel Company" [Near] vs. "Shanghai Steel Company" [Distant])[11] conditions.

Procedure and measures

Participants were invited to a lab session of which the current study was part of. They were provided with a questionnaire containing the scenario and the dependent measures. In the Spatial Near condition the scenario read as follows:

> Imagine that you have €1000 to invest in the stock market. After spending a few days searching for a relevant stock you hear that the value of "Tilburg Steel Company" (situated in the Tilburg), one of the many companies that you considered to invest in, "jumped" up by 20%. You do not know how solid this information is (so far it is only a rumor), but you do know that you can clarify this by calling your broker. If this information is correct and the value of "Tilburg Steel Company" had indeed increased by 20%, then this would mean that you missed the opportunity to earn €200.

In the Spatial Distant condition, participants read that they considered investing in "Shanghai Steel Company," located in Shanghai. Information seeking was assessed via the following four items (α = .78): the likelihood of uncovering whether the company that had its stocks increased is the company that was initially considered for investment, trying to avoid information that

[11] Because our participants study at Tilburg University, a stock company situated in Tilburg was assumed to represent psychological proximity and a stock company situated in Shanghai to represent psychological distance.

might reveal that an opportunity for profit was missed (reversed item), (0 = *very unlikely,* 10 = *very likely*), and the extent one would want to *search* and *avoid* (reversed item) this information (0 = *not at all,* 10 = *very much*).

Results and discussion

As expected, participants in the Spatial Near condition were more interested in information that would reveal whether an opportunity was missed (M = 6.89, SD = 1. 47), than participants in the Spatial Distant condition, (M = 6.13, SD = 1.78), $t(72) = -2.00$, $p = .049$, $d = .46$. These results again suggest that construal levels influence the search for potential unpleasant truths, this time, about the potential of missing an opportunity. Participants in the Spatial Near condition seemed to focus on the less-relevant but more affective features of the event (e.g., missing an opportunity for a profit) and expressed their need for reassuring information. However, participants in the Spatial Distant condition seemed less occupied with the potential loss of opportunity; consequently they were less likely to search for information.

Importantly, one may argue that the scenario information in the current Experiment lacks central features. Nevertheless, this study demonstrates that High Level construals reduce the impact of peripheral irrelevant features on affect and the corresponding information search. This decrease in information search was demonstrated even in the absence of obvious central goal.

Experiment 5.3

We suggested previously that adopting a low level construal of the situation might encourage people to seek information about unpleasant truths. Increasing attention to the peripheral features of the situation (i.e., loosing money to the photographer) may have augmented the experience of negative feelings, and consequently it may have increased the need to search for information (e.g., finding out that one was not ripped-off after all). Experiment 5.3 was designed for two reasons: First, we wanted to test whether the experience of negative feelings indeed mediates information search. Second, we tested whether the predicted impact of construal levels would hold, with different degrees of the negative experience (operationalized by the amount of money lost).

Method

Participants and design

Eighty students from Tilburg University (64 women, mean age 20) volunteered to participate in this study. The participants were randomly assigned to one of four conditions of the 2 visual perspectives (First-Person vs. Third-Person) × 2 (Overpaid Amount: €1000 vs. €200) factorial design.

Procedure and measures

In Experiment 5.3 we adopted another manipulation of construal levels, namely a visual perspective manipulation. Participants were provided with essentially the same scenario as in Experiment 5.1. After reading the scenario, they were asked to imagine themselves on their wedding day. The instruction for the first-third visual perspective manipulation was taken from Libby, Eibach and Gilovich, (2005). In the first-person condition, the instructions read:

> Please try to visualize the event FROM YOUR OWN VISUAL PERSPECTIVE, in other words, LOOKING OUT AT YOUR SURROUNDING THROUGH YOUR OWN EYES. Please try to make your memory image as detailed as possible.

In the third-person condition the scenario read:

> Try to visualize the event FROM AN OBSERVER'S VISUAL PERSPECTIVE, in other words, SO YOU CAN SEE YOURSELF IN THE MEMORY, AS WELL AS YOUR SURROUNDING. Please try to make your memory image as detailed as possible.

In both conditions, the visualization instructions were followed by five questions, which reinforced the specific visual perspective (cf. Libby et a., 2005). Participants were instructed to continue picturing the memory in the specified way and to consult their image to answer the questions. In the first-person condition, the questions were: 1. Can you see any furniture at the wedding location?, 2. Can you see any windows at the wedding location?, 3. Can you see anything hanging on the walls?, 4. Can you see anyone else in the room?, and 5. If so, can you see what they are wearing? In the third-person

condition, the questions were: 1. Can you see what you are wearing?, 2. Can you see what you are doing?, 3. Can you see what your facial expression was?, 4. Can you see how you are wearing your hair?, and 5. Can you see whether you are standing or sitting?

After completing these five dichotomous (yes/no) questions, participants were instructed to hold the image in mind and use it when indicating how likely they are to search information regarding the price others paid for videotaping the wedding. Information seeking was indexed via the same four items scales as in Experiment 5.1(α = .88). Next, participants were asked to indicate how much discomfort they would feel in this situation, thinking that they may find out that others paid less (0 = *not at all,* 10 = *very much*).

Results and discussion

As expected, participants reported feeling more discomfort when having a First-Person perspective (M = 3.90, SD = 2.66) than when having the Third Person perspective (M = 2.62, SD = 2.41), $F(1, 79) = 5.16$, $p = .026$ $\eta^2 = .06$ Similarly, we found that suspecting to overpay €1000 elicited stronger feelings of discomfort (M = 3.80, SD = 2.77) than suspecting to overpay €200 (M = 2.72, SD = 2.34), $F(1, 79) = 3.67$, $p = .059$, $\eta^2 = .04$ The latter replicates earlier findings for the amount of money lost for feeling of discomfort (Shani et al., 2007; Shani & Zeelenberg, 2007).

As for information search, a First-Person perspective enhanced participants interest in finding out whether others indeed paid less (M = 6.76, SD = 2.47), compared to a Third Person perspective (M = 5.48, SD = 2.43), $F(1, 79) = 5.98$, $p = .017$, $\eta^2 = .06$ Similarly, suspecting to overpay €1000 caused a stronger tendency to search information (M = 6.92, SD = 2.32) than suspecting to overpay €200 (M = 5.32, SD = 2.49), $F(1, 79) = 9.24$, $p = .003$, $\eta^2 = .10$ The latter again replicated earlier findings for the amount of money lost for information search (Shani et al., 2007; Shani & Zeelenberg, 2007). As we expected, no interaction was found between the different perspectives (i.e., First-Third person) and the Overpaid Amount for feelings of discomfort and information seeking $F < 1$.

To test the hypothesis that feelings of discomfort triggered information seeking, we conducted a regression analysis. The results revealed that the more discomfort people felt with the thought of being ripped-off, the more they wanted to know the exact amount paid by others, $\beta = .52$, $t(79) = 5.67$, $p < .001$.

Mediation Analysis

To test whether the Visual Perspective (i.e., First-Third person) is mediated by feeling discomfort, a series of regression models were estimated. The results are presented in Table 5.1. We already found that the predictor variable (Visual Perspective) influenced the mediator (Feeling discomfort) (Column 1), and the dependent variable (information seeking) (Column 2). To examine mediation, we regressed the dependent variable (Information Seeking) on both the predictor variable (Visual Perspective) and the mediator (Feeling Discomfort) and found that the predictor was no longer significant, while the mediator was (Column 3). The R^2 increases to .30 and the level of construal looses significant. A Sobel test (1982) revealed that the effect of level of construal on information seeking was mediated by experienced discomfort, $Z = 2.06$, $p = .039$[12]

The current experiment provides evidence that level of construals influences information seeking via the experienced feelings of discomfort. When imagining their wedding day from a first-person perspective, participants were more influenced by feelings of discomfort that associated with the lack of knowledge and displayed a stronger tendency to search information that may uncover whether or not they were ripped-off. Interpreting the situation from a third-person perspective, participants were less influenced by their level of experienced frustration, and were less inclined to search the information.

[12] When including both predictors and their interaction in the regression analysis, our findings show that feelings of discomfort mediated the perspective taken ($Z = 2.05$, $p = .04$) but the overpaid amount is marginally significant ($Z = 1.77$, $p = .075$). With corrected statistics, the effect of the overpaid amount is also significant (See MacKinnon, Fairchild, & Fritz, 2007; MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002).

Table 5.1

Results of Regression Analyses Testing for Mediation in Experiment 5.3

	Mediator	Dependent variable	Mediation test
Predictor variables	Feeling Discomfort	Information Seeking (no mediators)	Information Seeking (with Discomfort)
Visual Perspective (First vs. Third)	.24*	.25*	.13
Feeling Discomfort		-	.50**
R^2	.06*	.06**	.30**

Note. Standardized Beta coefficients are reported. * $p < .05$, ** $p < .01$

Experiment 5.4

Experiment 5.3 demonstrated that feelings of discomfort encourage the search of the potentially unpleasant information. We argued that people search this information, hoping to find a relief from their negative suspicion. This may happen when one believes that definite knowledge may reduce the negative feelings. If indeed the hope to find a relief from the experienced negative feelings is the motivation for information search, then eliminating the potential (e.g., the "means") of the information to improve the negative feelings should decrease information search. Put differently, the search for information is based on an affective goal, but reducing the instrumentality of means for this goal pursuit makes the information less relevant and less desirable (Gervey, Igou, & Trope, 2005; Kruglanski et al., 2002; Shah & Kruglanski, 2003; Trope, Gervey, & Bolger, 2003). Because affective information search is attributed mainly to participants in the Low Level construal condition, when reducing the instrumentality of means we expect these participants to show a decreased interest in this information, and thus no difference between construal level manipulations.

Method

Participants and design

One hundred and seventeen students from Tilburg University (82 women, mean age 19.5) volunteered to participate in this study. The experiment had a 2 Construal-Level (Why vs. How) × 2 Knowledge Improvement (Not-Improve vs. Control) between-participants design.

Procedure and measures

Participants were invited to participate in a larger experimental session of which the current study was part of. They were provided with the same scenario and construal-levels manipulation as in Experiment 5.1. Afterwards, participants in the Not-Improve condition read: "As a student at the psychology department, you may have heard that just knowing that you paid too much, does not improve feelings and 'rumination' continues (Johnson & Mayer, 2004)." In the control condition, this sentence was omitted. Then, participants were asked to imagine their wedding day, visualize themselves acting in a certain way, and to indicate in detail *why* or *how* would they act (see Experiment 5.1). Once again, information seeking was assessed via the four items scales as in the former experiments (α = .80).

Results and discussion

The data were analyzed using 2 (Construal Level) × 2 (Knowledge Improvement) ANOVA. The results are shown in Table 5.2. A significant Construal Level × Knowledge Improvement interaction was found, $F(1, 116) = 4.98$, $p = .028$, $\eta^2 = .04$. When not given improvement information, participants in the *how* (Low-Level construals) condition were more willing to search for the exact amount paid by others compared to participants in the *why* (High-Level construals) condition. These results replicate the findings of Experiments 5.1, 5.2 and 5.3. When the information was known to not improve feelings (Not-Improve condition), no difference was found for participants' willingness to search information between the construal levels condition.

These findings support our reasoning that the need to alleviate disconcerting feeling is more important for participants in the Low Level construal condition

then to participants in the High Level construal condition. When adopting a low-level construal, the potential of finding comforting information is perceived as more relevant and more desirable than when adopting a High Level construal. But, when the information is not instrumental for alleviating the unpleasant feeling, also participants in the Low Level construal condition show relative low interest toward the information that they could receive. Therefore, this study provides additional evidence that it is in fact the affective goal that drives individuals to search these unpleasant truths.

Table 5.2

Means and Standard Deviations of Information Seeking as a Function of the Level of Construal and Knowledge Improvement (Experiment 5.3)

	Level of Construal					
	Why (=High Level)		How (=Low Level)			
Knowledge Improvement	*M*	(*SD*)	*M*	(*SD*)	*t*(113)	*p* =
Not Improve	5.99	(2.40)	5.57	(2.23)	.68	.45
Control	5.35	(2.13)	6.71	(1.76)	-2.42	.017

Note. Ratings are means on 11-point scales (0-10), with higher values indicating more information seeking.

Experiment 5.5

Experiment 5.4 showed that when information is not instrumental for ameliorating feeling of discomfort due to not knowing the facts, individuals are less interested in the information even when adopting the Low Level construal. In the current experiment we sought to replicate and extend the results of Experiment 5.4. First, we used spatial distance to manipulate construal levels. Second, we added a condition in which participants were informed that the available information *could improve* their feeling of discomfort. Increasing the instrumental value of means makes this goal pursuit more desired (cf. Kruglanski et al., 2002; Shah & Kruglanski, 2003; Trope et al., 2003), therefore compensating against the usual decrease of this affective goal when individuals adopt the High Level construal. In other words, in addition to the

Not-Improvement condition of Experiment 5.4, in the current experiment some participants learned that knowing the facts can improve feelings of discomfort.

We expected to replicate the construal level effect on information seeking in the control condition. When the information was known to not improve feelings of discomfort (Not-Improvement condition) thus reducing desirability of goal pursuit, we expected a decrease in information seeking even when individuals adopted Low Level construal (As in Experiment 5.4). When the information was known to improve negative feelings, we expected strong information seeking even in the High Level construal condition.

Method

Participants and design

One hundred and two students from Tilburg University (80 women, mean age 19) volunteered to participate in this study. The experiment had a 2 Spatial Distance (Distant vs. Near) × 3 Knowledge Improvement conditions (Not-Improve vs. Improve vs. Control) between-participants design.

Procedure and measures

Participants were invited to a lab session of which the current study was part of. They were provided with a questionnaire containing the wedding scenario and the dependent measures.

In the Distant condition, participants read: "You just got back from your wedding in the *far north* of the Netherlands". In the Near condition, participants read: "You just got back from your wedding in the center of town, a *few blocks* a way from where you live" Then we presented the wedding scenario as in Experiments 5.1, 5.3 and 5.4.

In the Improve (vs. Not Improve) condition, participants read: "As a student at the psychology department, you may have heard that just knowing that you paid too much, *can improve* (*cannot improve*) feelings and reduces rumination". In the control condition, this sentence was omitted. Information seeking was assessed via the four items scales as in the former experiments ($\alpha = .76$).

Results and discussion

The data were analyzed using 2 (Spatial Distance) × 3 (Knowledge Improvement) factorial ANOVA. The results are shown in Table 5.3. A significant Spatial Distance × Knowledge Improvement interaction was found, $F(2, 100) = 3.34$, $p = .04$, $\eta^2 = .06$. When no information was given about the potential to improve negative feelings (Control condition), participants were more willing to search information that would disclose whether or not they were ripped-off in the Near condition (Low Level construals), than in the Distant condition (High Level construals). As we expected, no differences were found between levels of construal for information search when knowing the facts could (Improve condition) or could not (Not Improve condition) improve feelings. Overall, participants were more interested in information that is known to improve future feelings (Improve condition) ($M = 6.30$, $SD = 1.77$) than in information that could not improve feelings ($M = 5.38$, $SD = 2.04$) (Not Improve condition), $t(66) = 1.98$, $p = .053$, $d = .48$.

Table 5.3

Means and Standard Deviations of Information Seeking as a Function of the Level of Construal and Knowledge Improvement (Experiment 5.4)

	Level of Construal					
	Distant (=High Level)		Near (=Low Level)			
Knowledge Improvement	*M*	(*SD*)	*M*	(*SD*)	*t*(96)	*p* =
Not Improve	5.44	(1.79)	5.33	(2.31)	0.15	.877
Control	5.02	(2.20)	6.92	(1.55)	2.86	.005
Improve	6.44	(1.66)	6.16	(1.91)	-0.42	.674

Note. Entries are means on 11-point scales (0-10), with higher values indicating more information seeking.

Interestingly, increasing the desire to pursue the affective goal by highlighting the functionality of means to do so, leads to more information search even in

the High Level construal condition. These findings support our reasoning that it is the affective goal of reducing the discomfort feelings that mediates the effect of construal level on information seeking (Spencer, Zanna, & Fong, 2005).

General Discussion

People in general are willing to search information about unpleasant truths. They search this information not because they welcome exposing themselves to unpleasant experiences, but because a lack of knowledge is in itself disconcerting (Shani et al., 2007; Shani & Zeelenberg, 2007). In the present work we demonstrated how constural levels influence the search for definite knowledge about potentially unpleasant truths. When an event consists of both central and peripheral aspects, having a low-level construal shifts attention to the peripheral negative features of a situation and enhances feelings of discomfort. Consequently, this leads to an increase in individuals' willingness to search information in hope to reduce these discomforting feelings that are associated with not knowing the facts. Adopting a high level construal on the other hand consists with the central features of the situation, and lessens the effects of the affective burden and the need to engage in this information search.

In five experiments, by directly manipulating construal levels; Experiments 5.1, 5.4, or via psychological distance; Experiments 5.2, 5.5 (Spatial) and 5.3 (Social), we studied the effects of construal levels on the willingness to seek out potentially unpleasant information. These effects were demonstrated in different scenarios. Experiments 5.1 and 5.2 demonstrated that low-level construal promotes the acquisition of information. Experiment 5.3 validated the specific contribution of the experience of disconcerting feeling as a mediator of the information search process. Experiments 5.4 and 5.5 were designed to explore in more details the goal pursuits that underlies the information search process by establishing a casual chain relationship (Spencer, Zanna, & Fong, 2005). Specifically, we showed that participants adopting a low-level construal are more inclined to search information that would alleviate their disconcerting feelings, compared to participants who adopted a high-level construal. But, this construal level effect did not emerge

when we either reduced or increased the attractiveness of this affective goal pursuit.

There are several reasons why people would search information that may eventually confirm their experienced negative feelings. One reason to search such information would be the potential of being proved wrong. In direct relevance to the current chapter, this may happen for example when individuals find out that they were not ripped-off after all. Another reason would do with lack of knowledge being experienced more aversively than definite knowledge (Sieff et al., 1999). Thus, while lack of information may invite distressing thoughts and negative feelings, having definite knowledge may provide individuals with a mental closure that shields them from further rumination (Martin & Tesser, 1996).

Importantly, our findings show that high-levels (vs. low-levels) construals reduce the impact of the affective goals that we hold responsible for this information search, consequently reducing information search. Because high-level construal reduces the impact of the affective goal, the search for enhancing information when adopting a high-level construal can be interpreted as a genuine desire to learn or benefit from the information. Such information search can add to the existing central goal (e.g., having good memories about the wedding) but is not forced by the need to undo irritating uncertainty. In contrast, low level construals can be seen as a desperate desire to undo irritating uncertainty (e.g., by finding out whether one was ripped-off). In other words, low levels construals do not provide people many degrees of freedom, because the attention that is given to the negative features of a situation triggers negative feelings that they wish to alleviate.

Having people responding differently to "hot" stimuli depending on construal levels is consistent with earlier research. These studies demonstrated how the ability to *distract* attention from the negative features of the situation (Mischel, Ayduk, & Mendoza, 2003) and *revaluate* negative emotional experiences such as anger, hostility or frustration, indeed depend on the perspective taken to interpret the situation (e.g., Thinking of *what* emotions were felt vs. *why* were these emotions felt); (Kross et al., 2005; Trope & Liberman, 2000; for a review, see Liberman et al., 2006). Likewise, high-levels construals have shown to

increase people's self-control and to elicit a more negative evaluation of temptations, compared to low-levels construals (Fujita et al., 2006).

This research clearly adds to our previous findings regarding the search of unpleasant truths (Shani et al., 2007; Shani & Zeelenberg, 2007), and the processing of negative information. We established that the experience of negative feeling leads to information search. We suggested that people search information in hope to alleviate their negative feeling by excluding the possibility that an opportunity was missed, or that an unfavorable decision was made. They do so even when by seeking information they also expose themselves to information that may instead confirm their negative feeling. Taken together, our results support both our SUT paradigm, CLT, and extend the model by demonstrating and establishing a relation between construal levels, feelings, affective goals, and information search.

Conclusions

During the course of our lives, we face many important decisions which naturally demand our full attention and most careful responses. Not surprisingly, we often regret decisions we made "in the heat of the moment", decisions that at times resulted in hurting ourselves or others. When facing complex situations in which important decisions are made, we are often offered to "Give it some time", "have a vacation" or "try to see other's perspective" before responding. Exercising techniques that would extend our levels of construals seems appealing, now that our research shows that construal levels also shape information search in response to peripheral and central informational features of a problem.

There is a common expression in Hebrew that is intended to broaden people's views: "Things that you see from here, you don't see from there." This expression is consistent with the core assumption of construal levels theory, which suggest that different views are associated with cognitive representations of events. It is exactly this change of looking at unpleasant truths that does influence information search and the need to uncover unpleasant truths.

Chapter 6

Summary and Discussion

Negative knowledge enters our lives on a regular basis. This knowledge often serves important motives such as goal pursuit, learning, and self-improvement. Interestingly, people sometimes *search* painful information that *does not* serve these objectives. Alternatively, they sometimes *avoid* painful information that *does* serve these objectives. Why would people search non-usable and painful information? When and why would individuals prefer to avoid important and usable information? What are the underlying motivations of information search or information avoidance? The studies in this dissertation contribute to our understanding of the motivational values of the need to know, and its relevance for our well-being. Now that we come to the final point of the dissertation, let us first provide a short summary of the chapters. Then we will provide some discussion, and the implications of the present dissertation will be discussed.

Summary of the Empirical Chapters

The research in Chapter 2 provides the first evidence for the search of painful information. Results from five studies find effects of emotional and situational factors on the decision to seek out post-decision information about un-chosen alternatives. Experiment 2.1 tested participants' willingness to find out the outcome of an un-chosen investment, which was likely to have a higher value than the chosen investment. It showed that participants were more willing to acquire information when they were *responsible* for the decision. Experiment 2.2 showed that responsibility affects information seeking, particularly when suspecting that a *wrong* decision was made. Experiments 2.3, 2.4 and 2.5 examined the role of regret on information seeking. It was shown that regret about making the wrong investment (Experiment 2.3), forgetting to send in a lottery ticket (Experiment 2.4), and missing an opportunity to use a discount card after spending a month in Australia (Experiment 2.5), mediates the information-seeking behavior. Experiment 2.5 also demonstrated that the *experience* of regret (and not its anticipation) influences post-decision information seeking, even when the information is of no future use.

Chapter 2 revealed that people are willing to search painful information in hope to alleviate their negative feelings by excluding the possibility that unfavorable decision was made. Paradoxically, by seeking information people expose themselves to information that may instead confirm their negative feelings. Chapter 3 challenged the findings of Chapter 2 and investigated whether individuals are willing to search potential negative knowledge, even (and particularly) when they are likely to encounter it. The willingness to seek out potentially painful information (e.g., the outcome of a lottery one forgot to send-in) was examined in three studies. Experiment 3.1 demonstrated that the tendency to seek definite knowledge about the attractiveness of a forgone opportunity is mediated by the emotional discomfort associated with remaining ignorant, and influenced by the probability that the search will uncover aversive information. This finding was replicated in Experiment 3.2 in a lab setting. Experiment 3.3 demonstrated that definite knowledge is less-aversive than uncertain ignorance, even when one finds out that one had missed a superior opportunity.

In Chapters 2 and 3, we found that the search for painful and non-usable information serves as means to regulate experienced negative feelings. In Chapter 4, we demonstrate how important information can be avoided for the very same reason, depending on the situation's constraints. In four studies we discuss complex life situations, in which both pleasurable events (e.g., a vacation) and threatening knowledge (e.g., potentially finding out that one failed an exam, being infected with HIV) are anticipated. We demonstrate that people prefer to temporarily avoid important and useful information, interestingly, due to the information potential to force rumination and decrease the pleasure that is associated with upcoming events. This avoidance also existed when the participants indicated to be highly curious regarding the nature of the information.

In Chapter 5, willingness to seek out potentially negative information (e.g., being financially ripped-off on a wedding day and bypassing an opportunity for profit) was examined in five studies. In Experiments 5.1 we directly manipulated how abstractly individuals construe the scenario information ("why" versus "how" perspective). In Experiment 5.2 we manipulated construal levels via spatial distance ("near" versus "distant"). In Experiment 5.3 we manipulated construal levels by varying social distance ("self" versus "other"),

and examined whether the information search effect mediated by the level of discomfort that is associated with not knowing more about the event. In Experiments 5.4 and 5.5 we again manipulated construal levels ("why" versus "how" and spatial distance, respectively). In addition, we experimentally varied participants' beliefs in the instrumentality of knowing the information for the improvement of negative feelings. Our findings show that the experience of negative feelings and the willingness to search information that may confirm or disconfirm these feelings increases with low-level, but decreases with high-level construals of a situation.

Discussion of the Empirical Chapters

When suspecting to have made an inferior decision, to have missed an opportunity, or being ripped-off, people are willing to learn more about the situation (i.e., finding out whether one's suspicions are warranted) even when definite knowledge cannot improve their current state (Chapters 2, 3 and 5). Alternatively, when anticipating a pleasurable event, individuals may avoid important and useful information in order to maintain future events pleasurable (Chapter 4). Taken together, the findings described in Chapters 2 to 5 imply that the search of painful information serves more than the goal of improving judgment and choices. It is offered that the information itself sometimes serves as means to regulate the pains and comforts in our lives.

When and Why Do We Want to Know?
How Experienced Regret Promotes Post-Decision Information Search

To understand the "counterintuitive" need to obtain painful knowledge and why it is experienced regret and not anticipated regret that leads to information search, it is sufficient to compare the regulation strategies that are available for individuals *before* and *after* decisions are made (Zeelenberg & Pieters, 2006, 2007). Before decisions are made and negative feelings are anticipated, individuals have plenty degrees of freedom to minimize potential experiences of negative feelings in the future. This can be done for example by improving the quality of future decisions, by justifying it before hand, or by transferring responsibility of making the decision. However, after the decision is made and the outcome is known, justifying the decision remains the only relevant strategy for dealing with the regret. This is because not all the other

strategies are available. Consequently, it seems that in choosing between the two evils, the potential pain of ascertaining a mistake is less threatening than remaining in a state of uneasy ignorance. This leaves decision makers with unwarranted negative feelings and nothing much to loose by searching the information, as obtaining definite knowledge may reveal that an inferior decision was not made after all.

Perhaps more striking than individuals searching for information based on an unwarranted regret, is having them searching the information while being aware to the potential painful and the irrelevant nature of definite knowledge. This provides indirect support for Loewenstein (1994) knowledge deprivation perspective, which views curiosity and the need to know as driven by an aversive arousal that stems from the pain of not having information, rather than by the pleasure of obtaining it. Although this perspective mainly attempted to explain why people voluntarily expose themselves to situations that trigger curiosity (which is assumed to be experienced as aversive), our findings add to this viewpoint by showing that the "pain of not having information" encourages information search, even when definite knowledge is expected to be painful.

When Ignorance is Not Bliss:
How Feelings of Discomfort Promote the Search for Negative Information

The most important finding in Chapter 3 is that individuals are willing to search potential negative knowledge, even when they are likely to encounter it. Of course we now know that people search the information in hope to alleviate their unwarranted negative feelings, hoping to exclude the possibility that a poor decision was made or that an opportunity was missed. Yet in real life, often the obtained information is found to be painful and indicates that an inferior decision was indeed made, or that an opportunity was indeed missed. Therefore, when one believes that searching information might end-up with one running into negative knowledge; one should rather avoid the information. This is of course not what we have found.

Interestingly, Chapter 3 finds that the motivation to search information increases with the likelihood to encountering negative knowledge. With such a counterintuitive behavior, it is now difficult to argue that only the hope of

finding reassuring knowledge (i.e., information that reveals that an opportunity was not missed) underlies the chase for facts. It is more likely that the emotional discomfort that is associated with remaining in a state of ignorance, contributes to this process. Indeed, Experiments 3.1 and 3.2 demonstrate that the tendency to seek definite knowledge about the attractiveness of a forgone opportunity (the results of an unsent lottery ticket) is explained by the emotional discomfort associated with remaining ignorant. Most interesting, a stronger tendency to search information is found when the likelihood (i.e., probability) to uncover aversive information is high.

The findings of Chapter 3 shed light on the shift in predictions of cognitive dissonance theory from the 1957 version to the 1964 version, of how negative feelings affect the decision to seek or avoid information. Festinger's (1957) theory of cognitive dissonance predicted that dissonance produces information avoidance. The rationale for this prediction was that what one does not know does not hurt. However, when Festinger elaborated his theory in 1964, he predicted that dissonance would result in selective information seeking to bolster the individual's original decision. Overall, the theory offers that the existence of dissonance, being psychologically uncomfortable, encourages the avoidance of information that can increase the dissonance. The findings in Chapter 3 show that it is less the need to restore confidence by protecting ourselves from the information, rather it is the disconcerting (i.e., dissonance) state of ignorance that drives the search of information, seemingly in hope for reassurance. Supporting this point, Experiment 3.3 demonstrated that having definite knowledge is less-aversive than lack of knowledge even when one finds out that one had missed a superior opportunity.

In sum, Chapter 3 validated the relevance of negative arousal to information search. It demonstrates that individuals are willing to seek information that may confirm their negative feelings. More importantly, they are willing to do so even when they might encounter painful facts.

Choosing Ignorance: Why do People Avoid Useful Information?

Chapter 4 presents situational determinants of information avoidance. People often avoid threatening information such as information about whether or not they are carriers of a terminal disease. Avoiding threatening information may feel good in the short-run, but can be costly in the long-run for instance when the information avoided is essential for treatment. Nevertheless, Chapter 4 illustrates how important and useful information is strategically ignored, and is only searched when the "timing" to receive "bad news" feels right (e.g., after returning from a weekend in Paris).

It is worth mentioning that the literature provides only little evidence to the existence of information avoidance (Frey, 1986). From a theoretical point of view, there are at least two reasons why selective information avoidance is often weaker than information search. First, increasing knowledge serves the goal of learning, and ultimately leads to better decisions. Second, "Avoidance of further dissonant information merely hinders any increase in the existing dissonance. It does not, however, decrease the dissonance itself." (Frey, 1986, p. 70) In other words, information avoidance hinders the potential of alleviating negative feelings, for instance, by finding out that one is not carrier of a terminal disease after all.

Nevertheless, the findings in Chapter 4 show us that information avoidance does not necessarily depend on knowledge potential to contribute to one's future goals, nor its ability to reduce the level of the affective burden. The findings illustrate how *important* information (e.g., the results of an HIV test) is ignored because "knowing the facts" may interfere with future pleasurable events. It is offered that situational factors such as the *point in time* of which the information is obtained, may sometimes surpass the effects of other related concepts (e.g., information importance and potential contribution to future goals) despite their intuitive relevance.

Overall, Chapter 4 emphasizes the complexity of our daily life decisions, and offers that the decision "to know" often involves factors that *push* information search (e.g., negative arousal, rumination) and factors that *pull* information search (e.g., finding a relief, getting a closure). Experiment 4.2 for instance demonstrates an evaluation process for the negative effects of having definite

knowledge versus remaining ignorant (e.g., whether or not to know the results of an exam before going on a vacation). What is special in the current situation is that the information itself is used as means to self-regulation, by only exposing ourselves to information that we are able to tolerate at a given point in time.

Different Ways of Looking at Unpleasant Truths:
How Construal Levels Influence Information Search

Finally, Chapter 5 shows that the experience of negative feelings, and the willingness to search information that may confirm or disconfirm these feelings, depend on how the "informational" dilemmas are construed. Low level construals (for a review, see Liberman, Trope, & Stephan, 2006) have shown to enhance the experience of negative feelings and the need for reassuring knowledge. Most importantly, high level construals lessened the experience of negative feelings and the wish to uncover potential unpleasant truths. Whereas Chapter 4 explained why and when people may temporarily avoid *important* information, Chapter 5 adds to these findings by demonstrating how *peripheral* information (e.g., being financially ripped-off on your wedding day) can be searched or avoided depending on the level of which the situation was construed.

More over, the findings in Chapter 5 provide an interesting test of Loewenstein's (1994) explanation for curiosity's tendency to spontaneously emerge or decline (i.e., impulsivity). As we stated in the introductory chapter, information gap theory views curiosity as a form of a cognitive deprivation stemming from the attention that is given to gaps in knowledge. To link attention and impulsivity, Loewenstein described a study (Walter & Mischel, 1974) in which individuals immediate proximity to candies, generated a feeling of deprivation that increased impulsive behavior (e.g., eating a small candy now but missing an opportunity for a larger candy later). Similarly, construal level theory offers that the attention that is given to different elements of situations depends of how psychologically near or distant events are. In other words, curiosity depends on attention, and attention depends on the adopted level of construals. As high level construals have shown to distract attention from negative aspects of events (Liberman et al., 2006), with a diversion of attention from the source of the *negative arousal* (e.g., thinking about *why - for*

what reasons you got married and not about being financially ripped-off), curiosity should spontaneously decline. Indeed, in chapter 5 we learn that the *desire* to uncover unpleasant truths (i.e., knowing whether one was financially ripped-off on one's wedding day), decreases when adopting high level construals as attention is given to the central features of the event (i.e., the wedding). Yet, the search of potentially unpleasant information increases when attention is given to the peripheral features of the event (i.e., being financially ripped-off).

Overall, the research in Chapter 5 proposes that what people want to know often depends on cognitive representations of situations. An important implication of Chapter 5 is that cognitive representations also define the type of knowledge that people eventually hold. This is an important insight, as "what we know" often serves us in shaping our opinions and responses to lives littlest and biggest dilemmas.

Concluding Remarks

Did I pay too much? Could I find a better deal? How long has my partner being disloyal? Nobody wants to be a sucker. No one wishes to find out that he or she was or is an easy target. And so we search information in hope to reassure ourselves from our negative suspicions, yet by doing so we take the risk of actually confirming our deepest reservations. And we know it!

The "need for reassuring knowledge" we have presented throughout this dissertation offers several interesting implications. One of these implications could be relevant for the field of marketing. Previous research established that costumers tend to "take action" in response to their dissatisfaction in services, or to switch brands of consumer goods in response to missing attractive opportunities (Bougie, Pieters, & Zeelenberg, 2003; Zeelenberg & Van Putten, 2005). Nowadays, with the abundance of available opportunities (Schwartz, 2004), it is only a matter of time before costumers encounter circumstances in which "last week great opportunity" becomes "today's waste of money." As our findings imply that individuals search the potential unpleasant information particularly when they suspect or likely to find it, it is only a matter of time before costumers begin "exposing themselves to painful truths", which

eventually will be revealed. Business organizations may want to "track down" these individuals and try to reshape their impending negative opinions, before they form their negative responses.

Not only the search of negative information but also its avoidance entails important suggestions. Inferences from our research may also be relevant for the field of disease control and prevention. As stated earlier in the current dissertation, curiosity is known for its association with unpleasant arousal, while information search is seen as means to reduce the aversive feeling (Loewenstein, 1994). Yet, in Chapter 4 we learn that under some circumstances the experience of curiosity may not result in information search. Experiment 4.4 for example shows how individuals prefer to postpone a meeting with a clinic, regardless of their curiosity to learn their HIV test results. The results in Chapter 4 imply that individuals' wanting to know a certain fact, does not necessarily mean that individuals will actually search for the facts! In addition, past research showed that people may chronically differ in the type of information they want and need about their diseases (Miller, 1995); some would prefer to increase knowledge in order to deal with a threat while others would prefer to distract themselves (Miller, 1987). The avoidance ratings found in Chapter 4 despite the existing curiosity tells us that increasing knowledge depends on more than the desire for knowledge itself, nor the information importance and potential to promote future goals (Laffont, 1995).

Avoiding important information, even temporarily, may be costly for individuals as it limits their ability to react or adjust to dangers. The same reasoning may especially be relevant in situations in which the threatening knowledge does not seem to have any feasible contributions for individuals' future performance (i.e., decision making, learning goals). An extreme example of such a situation would be a person who tries to learn the circumstances that led to the death of a loved one. Although the current dissertation does not discuss such extreme circumstances, many of our studies dealt with counterfactual and often post-decision information (e.g., missed opportunities, forgone stocks investments, being financially ripped-off). Even though having this information had no clear future use, many of our participants chose to search the information hoping to find a relief from their nagging suspicions.

Searching non-important, non-relevant, or even counterfactual painful information encloses important implications for well-being, as it seems that going through daily affairs while "expecting the worst" could eventually drive the healthiest person among us crazy. As such, a mental closure is often needed and should not be underestimated.

Why do we keep exposing ourselves to painful information? Although a single series of studies as presented in this dissertation cannot cover all life situations which lead to the search of painful knowledge, the results do shed light on the underlying mechanism that encourages this behavior; four empirical chapters provide evidence showing that it is mainly how we feel at present that drives the search of negative knowledge, and less how we expect to feel *if* or *when* knowledge is found to be painful. Across the various studies demonstrating the diverse circumstances in which individuals search post-decision and often counterfactual information, or avoid important and future relevant information, the relevance of experienced negative feelings to information search was clear and very easy to trigger.

Our participants were often amused by the dilemmas that our information search paradigms posed. "I knew that it was pointless to check whether or not I could use the reduction card", "whether or not I was ripped-off", or "whether or not I could win the lottery as it was no longer running…"- many indicated while debriefed. Even as we know that individuals may expose themselves to painful information to serve their learning or self-improvement goals (Roese, 1994; Shah & Kruglanski, 2003), previous to the current dissertation it was unclear why would people search information that entails potential painful and seemingly useless features. Such counterintuitive strive for knowledge was particularly surprising, as people often overestimate the duration and intensity of their emotional distress in response to negative life experiences, or in our case, when encountering painful truths (Sieff, Dawes, & Loewenstein, 1999; Wilson & Gilbert, 2003). Therefore, they would be expected to avoid the painful information and not search for it.

This counterintuitive behavior seems more plausible, now that we know that people are more occupied with how ignorance feels, and less with how negative definite knowledge would feel. Put in Rumsfeld's (2002) terms: "…unknown

knowns, things we'd like to know, but don't know..." Thus, while lack of information may invite distressing thoughts and negative feelings, definite knowledge about painful realities may provide mental closure that shields from further rumination.

Kurt Lewin (1951, p.169) argued that "there is nothing so practical as a good theory." Putting our findings into practice, next time you meet someone who is trying to manage life's potential painful truths by searching for information, either a friend wondering whether the car he or she recently bought was dripping oil before the purchase, colleagues wondering whether their work failures could be attributed to their laziness, or your dating partner(s) wondering "do these jeans make me look fat"…realize that they are probably capable of inferring the answers to these questions on their own. They may still ask for your opinion in hope for reassurance.

References

Andreas, S. (2000). Enlarging the frame. *Anchor Point, 14,* 46-47.

Baron, J., & Hershey, J. C. (1988). Outcome bias in decision evaluation. *Journal of Personality and Social Psychology, 54*, 569-579.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic and statistical considerations. *Journal of Personality and Social Psychology, 51*, 1173-1182.

Bastardi, A., & Shafir, E. (1998). On the pursuit and misuse of useless information. *Journal of Personality and Social Psychology, 75,* 19-32.

Baumeister, R. F., Bratslavsky, E., Finkenauer, C., & Vohs, K. D. (2001). Bad is stronger than good. *Review of General Psychology, 5,* 323-370.

Baumeister, R. F., Vohs, K. D., DeWall, C. N., & Zhang, L. (in press). How emotion shapes behavior: Feedback, anticipation, and reflection, rather than direct causation. *Personality and Social Psychology Review*.

Bell, D. E., (1982). Regret in decision-making under uncertainty. *Operations Research, 30*, 961-981.

Berlyne, D. E. (1954a). A theory of human curiosity. *British Journal of Psychology, 45,* 180-191.

Berlyne, D. E. (1954b). An experimental study of human curiosity. *British Journal of Psychology, 45*, 256-265.

Berlyne, D. E. (1955). *Conflict, arousal and curiosity*. New York: McGraw-Hill.

Bougie, R., Pieters, R., & Zeelenberg, M. (2003). Angry customers don't come back, they get back: The experience and behavioral implications of anger and dissatisfaction in services. *Journal of the Academy of Marketing Science, 31*, 377-393.

Brehm, J. W., & Wicklund, R. A. (1970). Regret and dissonance reduction as a function of post decision salience of dissonant information. *Journal of Personality and Social Psychology, 14*, 1-7.

Carmon, Z., Wertenbroch, K., & Zeelenberg, M. (2003). Option attachment: When deliberating makes choosing feel like losing. *Journal of*

Consumer Research, 30, 15-29.

Carver, C. S., & Scheier, M. F. (1998). *On the self-regulation of behavior*. Cambridge, England: Cambridge University Press.

Connolly, T., & Zeelenberg, M. (2002). Regret in decision making. *Current Directions in Psychological Science, 11*, 212-216.

Festinger, L. (1957). *A theory of cognitive dissonance*. Stanford, CA: Stanford University Press.

Festinger, L. (Ed.). (1964). *Conflict, decision and dissonance*. Stanford, CA: Stanford University Press.

Festinger, L., & Walster, E. (1964). Post-decision regret and decision reversal. In L. Festinger (Ed.), *Conflict, decision, and dissonance* (pp.112-127). Stanford, CA: Stanford University Press.

Freitas, A. L., Gollwitzer, P. M., & Trope, Y. (2004). The influence of abstract and concrete mindsets on anticipating and guiding others' self-regulatory efforts. *Journal of Experimental Social Psychology, 40*, 739-752.

Frey, D. (1986). Recent research on selective exposure to information. *Advances in Experimental Social Psychology, 19*, 41-80.

Fujita, K., Trope, Y., Liberman, N., & Levin-Sagi, M. (2006). Construal levels and self control. *Journal of Personality and Social Psychology, 90,* 351-367.

Gervey, B., Igou, E. R., & Trope, Y. (2005). Positive mood and future-oriented self-evaluation. *Motivation and Emotion, 29*, 269-296.

Gilbert, D. T., Driver-Linn, E., & Wilson, T. D. (2002). The trouble with Vronsky: Impact bias in the forecasting of future affective states. In L. Feldman-Barrett & P. Salovey (Eds.), *The wisdom of feeling* (pp. 114-143). New York: Guilford.

Gilbert, D. T., Pinel, E. C., Wilson, T. D., Blumberg, S. J., & Wheatley, T. P. (1998). Immune neglect: A source of durability bias in affective forecasting. *Journal of Personality and Social Psychology, 75*, 617-638.

Gneezy, U., List, J. A., & Wu, G. (2006). The uncertainty effect: When a risky prospect is valued less than its worst possible outcome. *Quarterly Journal of Economics, 121*, 1283-1309.

Gray, T. (1891). Ode on a distant prospect of Eton College. In J. Bradshaw (Ed.), *The poetical works of Thomas Gray* (pp. 7-11). London: Bell.

Haddon, M. (2003). *The curious incident of the dog in the night-time*. New York: Doubleday.

Henderson, M. D., Fujita, K., Trope, Y., & Liberman, N. (2006). Transcending the "Here": The effects of spatial distance on social judgment. *Journal of Personality and Social Psychology, 91*, 845-856.

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.

Inman, J. J., & Zeelenberg, M. (2002). Regret in repeat purchase versus switching decisions: The attenuating role of decision justifiability. *Journal of Consumer Research, 29*, 116-128.

Janis, I., & Mann, L. (1977). *Decision making: A psychological analysis of conflict, choice and commitment.* New York: Free Press.

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica, 47*, 263-291.

Keren, G., & De Bruin, W. B. (2003). On the assessment of decision quality: Consideration regarding utility, conflict and accountability. In D. Hardman & L. Macchi (Eds.), *Thinking: Psychological perspectives on reasoning, judgment and decision making* (pp. 347-363). West Sussex: John Wiley & Sons, Ltd.

Kross, E., Ayduk, O., & Mischel, W. (2005). When asking "why" does not hurt: Distinguishing rumination from reflective processing of negative emotions. *Psychological Science, 16*, 709-715.

Kruglanski, A. W. (2004). *The psychology of closed mindedness*. New York: Psychology Press.

Kruglanski, A. W., Shah, J. Y., Fishbach, A., Friedman, R., Chun, W. Y., & Sleeth-Keppler, D. (2002). A theory of goal systems. *Advances in Experimental Social Psychology, 34, 34*, 331-378.

Laffont, J. (1989). *The economics of uncertainty and information*. Cambridge, MA: MIT Press.

Larsen, R. J. & Prizmic, Z. (2004). Affect regulation. In: R. Baumeister & K. D. Vohs (Eds.), *Handbook of self-regulation. Research, theory, and applications* (pp. 40-61). London: Guilford.

Lewin, K. (1951). *Field theory in social science: Selected theoretical papers*. New York: Harper & Row.

Libby, L. K., Eibach, R. P., & Gilovich, T. (2005). Here's looking at me: The effect of memory perspective on assessments of personal change. *Journal of Personality and Social Psychology, 88,* 50-62.

Liberman, N., & Trope, Y. (1998). The role of feasibility and desirability considerations in near and distant future decisions: A test of temporal construal theory. *Journal of Personality and Social Psychology, 75,* 5-18.

Liberman, N., Trope, Y., & Stephan, E. (2006). Psychological distance. In E. T. Higgins & A. Kruglanski (Eds.), *Social Psychology: Handbook of Basic Principles, 2nd edition.* New York: Guilford.

Litman, J. A., Hutchins, T. L., & Russon, R. K. (2005). Epistemic curiosity, feeling-of-knowing, and exploratory behaviour. *Cognition & Emotion, 19*, 559-582.

Loewenstein, G. (1987). Anticipation and the valuation of delayed consumption. *The Economic Journal, 97*, 666-684.

Loewenstein, G. (1994). The psychology of curiosity: A review and reinterpretation. *Psychological Bulletin, 116*, 75-98.

Loewenstein, G. (2006). The pleasures and pains of information. *Science, 312*, 704-706.

Loomes, G., & Sugden, R. (1982). Regret theory: An alternative theory of rational choice under uncertainty. *Economic Journal*, *92*, 805-824.

MacKinnon, D. P., Fairchild, A. J., & Fritz, M. S. (2007). Mediation analysis. *Annual Review of Psychology, 58*, 593-614

MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., & Sheets, V. (2002). A comparison of methods to test the significance of the mediated effect. *Psychological Methods, 7,* 83-104.

Markman, K. D., Gavanski, I., Sherman, S. J., & McMullen, M. N. (1993). The mental simulation of better and worse possible worlds. *Journal of*

Experimental Social Psychology, 29, 87-109.

Martin, L. L., & Tesser, A. (1996). Some ruminative thoughts. In R. S. Wyer, Jr. (Ed.), *Ruminative thoughts* (pp. 1-47). Mahwah, NJ: Erlbaum.

Miller, S. M. (1987). Monitoring and blunting: Validation of a questionnaire to assess styles of information seeking under threat. *Journal of Personality and Social Psychology, 52*, 345-353.

Miller, S. M. (1995). Monitoring versus blunting styles of coping with cancer influence the information patients want and need about their disease: Implications for cancer screening and management. *Cancer, 76*, 167-177.

Mischel, W., Ayduk, O., & Mendoza-Denton, R. (2003). Sustaining delay of gratification over time: A hot-cool systems perspective. In G. Loewenstein & D. Read (Eds.), *Time and decision: Economic and psychological perspectives on intertemporal choice* (pp. 175-200). New York, NY: Russell Sage Foundation.

Northcraft, G. B., & Ashford, S. J. (1990). The preservation of self in everyday life: The effects of performance expectations and feedback context on feedback inquiry. *Organizational Behavior and Human Decision Processes, 47*, 42-64.

Roese, N. J. (1994). The functional basis of counterfactual thinking. *Journal of Personality and Social Psychology, 66*, 805-818.

Roese, N. J., & Summerville, A. (2005). What we regret most .... and why. *Personality and Social Psychology Bulletin, 31*, 1273-1285.

Rottenstreich, Y., & Hsee, C. K. (2001). Money, kisses, and electric shocks: On the affective psychology of risk. *Psychological Science, 12*, 185-190.

Sagristano, M. D., Trope, Y., & Liberman, N. (2002). Time-dependent gambling: Odds now, money later. *Journal of Experimental Psychology: General, 131*, 364-376.

Schwartz, B. (2004). *The paradox of choice: Why less is more*. New York: Harper Collins.

Shah, J. Y., & Kruglanski, A. W. (2003). When opportunity knocks: Bottom-up priming of goals by means and its effects on self-regulation. *Journal of Personality and Social Psychology, 84*, 1109-1122.

Shani, Y., Igou, E., & Zeelenberg, M, (2007). Different ways of looking at unpleasant truths: How construal levels influence information search. *Manuscript submitted for publication.*

Shani, Y., Tykocinski, O. E., & Zeelenberg, M. (in press). When ignorance is not bliss: How distressing uncertainty drives the search of negative information. *Journal of Economic Psychology.*

Shani, Y., Zeelenberg, M., & Van de Ven, N. (2007). Choosing ignorance: Why do people avoid useful information? *Manuscript submitted for publication.*

Shani, Y., & Zeelenberg, M. (2007). When and why do we want to know? How experienced regret promotes post-decision information search. *Journal of Behavioral Decision Making, 20,* 207-222.

Sieff, E. M., Dawes, R. M., & Loewenstein, G. (1999). Anticipated versus actual reaction to hiv test results. *American Journal of Psychology, 112*, 297-311.

Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. In S. Leinhart (Ed.), *Sociological methodology* (pp. 290-312). San Francisco: Jossey-Bass.

Spencer, S. J., Zanna, M. P., & Fong, G. T. (2005). Establishing a causal chain: Why experiments are often more effective than mediational analyses in examining psychological processes. *Journal of Personality and Social Psychology, 89,* 845-851.

Trope, Y., Gervey, B., & Bolger, N. (2003). The role of perceived control in overcoming defensive self-evaluation. *Journal of Experimental Social Psychology, 39*, 407-419.

Trope, Y., & Liberman, N. (2000). Temporal construal and time-dependent changes in preference. *Journal of Personality and Social Psychology, 79*, 876-889.

Trope, Y., & Liberman, N. (2003). Temporal construal. *Psychological Review, 110*, 401-421.

Tykocinski, O. E., & Pittman, T. S. (1998). The consequences of doing nothing: Inaction inertia as avoidance of anticipated counterfactual regret. *Journal of Personality and Social Psychology, 75*, 607-616.

Tykocinski, O. E., Pittman, T. S., & Tuttle, E. E. (1995). Inaction inertia: Foregoing future benefits as a result of an initial failure to act. *Journal of Personality and Social Psychology, 68*, 793-803.

Tykocinski, O. E., & Ruffle, B. (2003). Reasonable reasons for waiting. *Journal of Behavioral Decision Making, 16,* 147-157.

Vallacher, R. R., & Wegner, D. M. (1989). Levels of personal agency: Individual variation in action identification. *Journal of Personality and Social Psychology, 57,* 660-671

Van de Ven, N., Zeelenberg, M., & Van Dijk, E. (2005). Buying and selling exchange goods: Outcome information, curiosity and the endowment effect. *Journal of Economic Psychology*, *26*, 459-468.

Van den Bos, K., & Lind, E. A. (2002). Uncertainty management by means of fairness judgments. *Advances in Experimental Social Psychology, 34*, 1-60.

Van Dijk, E., & Zeelenberg, M. (2007). When curiosity killed regret: Avoiding or seeking the unknown in risky decision-making. *Journal of Experimental Social Psychology, 4,* 656-662.

Van Dijk, W. W., & Van der Pligt, J. (1997). The impact of probability and magnitude of outcome on disappointment and elation. *Organizational Behavior and Human Decision Processes, 69*, 277-284.

Wicklund, R. A., & Brehm, J. W. (1976). *Perspectives on cognitive dissonance.* Hillsdale, NJ: Erlbaum.

Wilson, T. D., Centerbar, D. B., Kermer, D. A., & Gilbert, D. T. (2005). The pleasure of uncertainty: Prolonging positive moods in ways people do not anticipate. *Journal of Personality and Social Psychology, 88*, 5-21.

Wilson, T. D., & Gilbert, D. T. (2003). Affective forecasting. *Advances in Experimental Social Psychology, 35*, 345-411.

Wilson, T. D., Gilbert, D. T., & Centerbar, D. B. (2002). Making sense: The causes of emotional evanescence. In J. Carillo & I. Brocas (Eds.), *The psychology of economic decisions,* (Volume 1, pp. 209-233). Oxford: Oxford University Press.

Zeelenberg, M. (1999a). Anticipated regret, expected feedback and behavioral decision-making. *Journal of Behavioral Decision Making, 12,* 93-106.

Zeelenberg, M. (1999b). The use of crying over spilled milk: A note on the rationality and functionality of regret. *Philosophical Psychology, 12*, 325-340.

Zeelenberg, M., Nijstad, B. A., Van Putten, M., & Van Dijk, E. (2006). Inaction inertia, regret and valuation: A closer look. *Organizational Behavior and Human Decision Processes, 101*, 89-104.

Zeelenberg, M., & Pieters, R. (2006). Looking backward with an eye on the future: Propositions towards a theory of regret regulation. In L. J. Sanna & E. C. Chang (Eds.). *Judgments over time: The interplay of thoughts, feelings, and behaviors* (pp. 210-229). New York: Oxford University Press.

Zeelenberg, M., & Pieters, R. (2007). A theory of regret regulation 1.0. *Journal of Consumer Psychology, 17*, 3-18.

Zeelenberg, M., Van Dijk, W. W., & Manstead, A. S. R. (2000). Regret and responsibility resolved? Evaluating Ordonez and Connolly's (2000) conclusions. *Organizational Behavior and Human Decision Processes, 81*, 143-154.

Zeelenberg, M., & Van Putten, M. (2005). The dark side of discounts: An inaction inertia perspective on the post-promotion dip. *Psychology and Marketing, 22*, 611-622.

Summary in Dutch[13]

Het onderzoek gepresenteerd in Hoofdstuk 2 levert als eerste het bewijs dat mensen pijnlijke informatie opzoeken. Resultaten van vijf studies lieten zien dat emotionele en situationele factoren mede bepalen of er na een beslissing gezocht wordt naar informatie over het niet gekozen alternatief. In Experiment 2.1 werd nagegaan in welke mate proefpersonen meer wilden weten over de opbrengst van een niet gekozen investering, wanneer deze waarschijnlijk hoger zou liggen dan de opbrengst uit de door hun gekozen investering. De resultaten wezen uit dat wanneer de proefpersonen verantwoordelijk waren voor de gemaakte beslissing, zij meer geneigd waren om te zoeken naar deze informatie. Experiment 2.2 toont aan dat verantwoordelijkheid de zoektocht naar informatie beïnvloedt, vooral wanneer het vermoeden aanwezig is dat de gemaakte beslissing fout was. In Experiment 2.3, 2.4 en 2.5, werd de rol van spijt in het zoeken naar informatie onder de loep genomen. Deze experimenten toonden aan dat de mate waarin informatie gezocht werd, gemedieerd werd door spijt over het gemaakt hebben van een verkeerde investering (Experiment 2.3), spijt over het vergeten zijn een loterijticket in te zenden (Experiment 2.4), of spijt over het niet gebruikt hebben van een kortingskaart na een maand in Australië te hebben vertoefd (Experiment 2.5). Experiment 2.5 toonde ook aan dat de ervaring van spijt (en niet de anticipatie ervan) dit zoekgedrag beïnvloedt, ook wanneer de informatie niet nuttig is voor toekomstig gebruik.

In Hoofdstuk 2 wordt aangetoond dat mensen op zoek zijn naar pijnlijke informatie, in de hoop hun negatieve gevoelens te verlichten door het uitsluiten van de mogelijkheid dat een ongunstige beslissing werd genomen. Paradoxaal hieraan is echter dat men door op zoek te gaan naar informatie, men zich ook blootstelt aan informatie die mogelijk hun negatieve gevoelens versterkt. Hoofdstuk 3 breidde de bevindingen uit Hoofdstuk 2 verder uit door na te gaan in welke mate men bereid is potentieel negatieve informatie te zoeken, zelfs wannneer men vrij zeker is dat deze negatief zal zijn. De mate waarin men naar pijnlijke informatie zoekt (bvb. de uitslag van de loterij waaraan men vergat deel te nemen), werd onderzocht in drie studies. Experiment 3.1 illustreerde dat de probabiliteit dat de informatie negatief zal zijn over de attractivititeit van een verloren mogelijkheid wordt gemedieerd door emotionele ongemak van het ontwetend blijven. Deze neiging naar het zoeken van informatie wordt beïnvloed door de waarschijnlijkheid dat de zoektocht

[13] I thank Pieter Desmet for kindly translating this summary into Dutch and Ilona de Hooge and Lieven Brebels for their helpful comments

negatieve informatie blootlegt. Deze bevindingen werden in een gecontroleerde laboratoriumsetting gerepliceerd in Experiment 3.2. Experiment 3.3 wees uit dat sluitende informatie minder aversief is dan onzekere onwetendheid, zelfs wanneer men te horen krijgt dat men een prachtige kans is misgelopen.

Waar Hoofdstuk 2 en 3 bewijzen dat pijnlijke en onbruikbare informatie opgezocht wordt om de ervaren negatieve gevoelens te reguleren, toont hoofdstuk 4 aan dat, afhankelijk van de situatie, om net dezelfde reden belangrijke informatie ook gemeden kan worden. Deze vier studies maken allen gebruik van complexe levenssituaties waarin zowel een aangename gebeurtenis (bvb. een vakantie) als bedreigende informatie (bvb. informatie over het al dan niet gezakt zijn voor een examen, of over het al dan niet seropositief zijn) geanticipeerd worden. De resultaten wijzen er interessant genoeg op dat mensen prefereren om bruikbare, maar potentieel negatieve informatie tijdelijk te vermijden als die informatie ruminatie kan veroorzaken en het plezier van de verwachte gebeurtenis kan verminderen. Dit ontwijkingsgedrag persisteerde ook wanneer deelnemers aangaven zeer nieuwsgierig te zijn naar wat de informatie inhield.

In Hoofdstuk 5 wordt aan de hand van 5 experimenten de bereidheid om potentieel negatieve informatie te zoeken bestudeerd (bvb. financieel opgelicht worden op je trouwdag, een winstmogelijkheid mislopen). In Experiment 5.1 werd de mate waarin mensen de scenario-informatie abstract interpreteren gemanipuleerd (“Hoe?” vs. “Waarom?”). In Experiment 5.2 werd het interpretatieniveau gemanipuleerd volgens fysieke nabijheid (“dichtbij” vs. “veraf”). In Experiment 5.3 werd de manier waarop de informatie geïnterpreteerd wordt, gemanipuleerd volgens sociale afstand (“zelf” vs. “ander”). Ook werd daar nagegaan of het effect op het zoeken naar informatie gemedieerd wordt door de mate waarin er ongemak ervaren wordt door het niet méér te weten over de gebeurtenis. In Experiment 5.4 en 5.5 werden opnieuw respectievelijk abstractieniveau (“Hoe?” vs. “Waarom?”) en fysieke nabijheid (“dichtbij” vs. “veraf”) gemanipuleerd. Aanvullend hierbij werd gemanipuleerd in welke mate de informatie efficiënt lijkt te zullen zijn in het reduceren van de negatieve gevoelens. Onze bevindingen tonen aan dat de negatieve gevoelens en de bereidheid potentieel negatieve informatie op te zoeken, toenemen naarmate de situatie als minder abstract en minder fysisch of sociaal veraf gezien wordt. Wanneer de situatie daarentegen abstracter is of fysisch (of sociaal) verderaf ligt, zijn er minder negatieve gevoelens en wordt er ook minder naar potentieel negatieve informatie gezocht.

Acknowledgements

I would like to thank my academic mentor, Marcel Zeelenberg. I was honored being a team-member in your lab, and taking a part in its growth and development from its early stages. I value your wisdom, your patience and kindness. It has been a privilege and a pleasure working with you.

I would like to thank Orit Tykocinski, Gideon Keren, Eric van Dijk, Rik Pieters, Diederik Stapel, and Eric Igou. It is an honor having you in my dissertation committee and I highly appreciate the time invested, and your insightful suggestions.

In Israel. I thank Arie Raichel, for his faith in me, and for making this all possible. I thank Orit Tykocinski who was always willing to act on my behalf. I do hope that our paths will cross again in the future.

For making my stay in the Netherlands extremely pleasant, a special word of thanks goes to Mira and Gideon Keren who made me always feel welcome!

I thank my colleagues at the department of Economic and Social Psychology for providing a pleasant and an inspiring work environment. I thank my roommates, Niels van de Ven and Jeroen Stouten for providing an amusing environment I could never work in.

I would like to thank Ton Heinen and Hans Dieteren for their kindness. I thank Yori Gidron for his pleasant company and the enjoyable collaboration.

Special thanks to Seger the “Groot Leider” Breugelmans, who is lately frustrated due to the immense admiration he suffers for his wisdom, honesty and modesty, yet the lack of appreciation of his other important qualities such as, tallness, and young looks. Eric Igou, whom I could always trust to surprise me with “another great paper you must read” (Thanks Eric!) but also with Super Bowl nights and relaxing days on the beach.

The unforgettable “Antwerp Ice-Skate team”: Pieter, Lieven and their wonderful girlfriends Han and Evy. My good friend Jeroen “The Main Man” Stouten and his wonderful girlfriend Thea. Not to forget the ultimate “Schat” Maike. Wonderful wild times indeed people! …No use to deny as I have wonderful incriminating pictures…!

To the many people I met throughout this journey but could not name. Thanks a bunch! Somehow I have a feeling that this is just the beginning…