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THE INVERSE RELATION BETWEEN SELF-ESTEEM AND ANTICIPATORY COPING

by

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Abstract

At one time or another, we all experience psychologically aversive events that we cannot, or have failed to, avoid. The effects of such events can sometimes be ameliorated by preparatory thoughts and behavior (i.e., anticipatory coping). I propose that self-esteem is inversely related to anticipatory coping. High self-esteem (HSE) people can be distinguished from low self-esteem (LSE) individuals on the related dimensions of optimism and caution. HSE people are relatively optimistic and LSE people are comparatively pessimistic and cautious. I hypothesize that LSE individuals may more readily anticipate negative occurrences and less readily anticipate positive occurrences than HSE people. Such self-esteem differences would afford LSE people more opportunity to prepare for disagreeable future episodes. I hypothesize that LSE individuals, arguably due to their cautious nature, engage in more anticipatory coping than HSE people. Also, I explore the relation between self-esteem and anticipatory coping when a disagreeable episode is more or less probable. Compared to an improbable aversive event, HSE and LSE people will prepare more if it is relatively probable. LSE people, though, will vary their preparation behavior less than HSE individuals. Specifically, LSE people will err on the side of caution and prepare for an improbable aversive event more than will HSE individuals. In Study 1, I tested my hypothesis that LSE people more readily anticipate negative future events than HSE people (and vice versa for positive events). Using a response latency paradigm, I found that LSE people more quickly thought of negative future events than HSE people. HSE people were faster in thinking of positive future episodes. In Study 2, I investigated self-esteem differences in anticipatory coping. Participants were instructed to imagine that one good and one bad event was certain to occur. They then described each event and indicated how they would cope with the negative occurrence. Reinforcing the findings of the first study, people with low self-regard envisioned negative future occurrences in greater detail than did high self-esteem people.

There were no self-esteem differences in anticipatory coping, however. In Study 3, the probability of an impending aversive event was varied and self-esteem differences in anticipatory coping were investigated. Participants were faced with either a low or high probability of engaging in a painful task. They were then informed of a previously successful preparatory strategy for reducing pain and given the opportunity to use it. The amount of time participants dedicated to preparation for the aversive event was measured. Overall, participants in the high probability condition prepared more than those in the low probability condition. Compared to HSE people, LSE individuals were relatively insensitive to the probability of the aversive event. The amount of time LSE participants dedicated to preparation for the aversive event did not significantly differ between the high and low probability conditions, whereas HSE individuals' preparation time did. HSE people prepared more in the high probability condition than in the low probability condition. In the low probability condition, LSE participants prepared more for the painful episode than HSE people. The consequences of the anticipatory coping findings are discussed.

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Introduction

“Into each life a little rain must fall,” so goes a well-known phrase. We have all experienced the unexpected loss of a loved one, failure despite our best efforts, or unavoidable physical pain. Unfortunately, the characteristics of such events are often unalterable. Death is permanent, some blotches on one’s record are indelible, and giving birth hurts. We can only cope with the consequences to the best of our ability. Just as some people are struck by more misfortune than others, so too some cope more effectively. Indeed, we all know people who appear more or less prepared to endure difficult times. I argue that differences in self-esteem can account for variability in individuals’ coping behaviors. In contrast to high self-esteem (HSE) people, low self-esteem (LSE) individuals are pessimistic and cautious. These characteristics render LSE people more inclined to anticipate and prepare for psychologically aversive eventualities. I present three studies that evaluate my claims.

Aspinwall and Taylor (in press) distinguish three kinds of coping: (a) proactive coping, (b) anticipatory coping, and (c) coping proper. Proactive coping involves behaviors directed at preventing the occurrence of an aversive event or minimizing its impact. A person who investigates the safety record of various car models before making a purchase engages in proactive coping. Anticipatory coping involves those thoughts and activities aimed at minimizing the harmful consequences of an event. Thus, if or when the nature of an occurrence is unalterable via proactive coping, anticipatory coping is the next recourse. A woman who performs relaxation exercises before giving birth engages in anticipatory coping. Finally, there is coping proper—strategies employed during and after an aversive event occurs.¹ Because the current investigation concerns how people prepare for aversive events with unalterable characteristics, I will focus on self-esteem differences in anticipatory coping.

¹In Lazarus and Folkman’s (1984) terms, proactive coping should be construed as occurring prior to primary appraisal, and anticipatory and subsequent coping as a response to the question raised by secondary appraisal (i.e., “What should I do?”).

There are two kinds of situations in which anticipatory coping is relevant: those in which proactive coping has resulted in failure or incomplete success, and those in which proactive efforts cannot be made. Events such as failing an exam despite all best efforts, or experiencing the end of an intimate relationship despite trying to be an exemplary romantic partner fall into the first category. Events such as a loved one passing away after a long illness, or undergoing a required painful medical examination are examples of the second. I will investigate anticipatory coping in both contexts.

The Case for High Self-Esteem

It is intuitively plausible that high self-esteem is positively associated with the ability to effectively prepare for psychologically aversive events. Indeed, some authors have identified high self-esteem as a panacea for many ills (California Task Force, 1990). There is some evidence for a positive relation between self-esteem and the ability to cope with disagreeable circumstances. Jahanshahi (1991) studied people with spasmodic torticollis—a disturbing neurological condition in which the head moves involuntarily and has an abnormal posture. Through the administration of self-report questionnaires, the author found that those with higher self-esteem were more accepting of their condition and more willing to adjust to it. In another self-report study, Johnson and colleagues (R. Johnson, Lund, & Dimond, 1986) found a positive relation between self-esteem and coping in a recently widowed sample. Respondents reported, in summary fashion, their opinion of themselves and their coping ability. Relatedly, Petrie and Rotheram (1982) found that self-esteem negatively correlated with stress symptoms among firefighters.

A definite conclusion that self-esteem is positively related to anticipatory coping, though, is not warranted. The above researchers' measures were based solely on self-report (i.e., self-assessments of coping). Therefore, it is not possible to distinguish the findings from a reporting bias. Perhaps HSE people merely expressed optimism about their ability to cope.

In addition, though Petrie and Rotheram (1982) did find evidence for a role of self-esteem, they did not employ measures of coping but focused on stress—a distinct construct (Lazarus & Folkman, 1984). More importantly, the researchers did not distinguish among types of coping. Therefore, the relation between self-esteem and anticipatory coping is yet to be delineated.

Nonetheless, the relation between self-esteem and anticipatory coping may be straightforward: Because, it could be argued, individuals' high opinion of themselves both causes and is reinforced by superior functioning in many modes of life (Coopersmith, 1970), it follows that HSE individuals also have the ability to prepare for psychologically distressing episodes. HSE individuals might possess a superior "psychological immune system" (Gilbert, Pinel, Wilson, Blumberg, & Wheatly, 1998) that aids them in trying situations.

The Function of Self-Esteem in Daily Life

The Benefits of Positive Self-Regard

There are many benefits of positive self-regard. In the domain of relationships, for example, HSE people are relatively well-off. Murray and colleagues (e.g., Murray, Holmes, & Griffin, in press) have found self-esteem to be a key determinant of thoughts, feelings, and behaviors in romantic relationships. Due to a process of projection, people with high self-esteem assume that their partner thinks highly of them and people with low self-esteem come to the opposite conclusion. This unfortunate belief on the part of LSE individuals can lead to a downward spiral in their relationships. Steele's Self-Affirmation Theory (Steele, 1988) poses a central role for self-esteem in the maintenance of a sense of integrity. At various points in our lives, we engage in actions that we later deem counter to our self-definition. Steele contends that when we encounter such threats to our self-integrity, we attempt to diminish them through affirmation of the self in other domains. Thus, the Olympian who did not win gold said, "Oh well, I guess it's off to medical school" (cited in Josephs, Larrick,

Steele, & Nisbett, 1992). HSE individuals successfully repair their self-integrity in such a manner. In contrast, the self is not an abundant resource for LSE people. In fact, self-focus can result in LSE people needing to bolster their self-image through, for example, downward social comparisons (Spencer, Fein, & Steele, 1992).

Recently, though, a negative aspect of high self-regard has been highlighted. Baumeister, Smart, and Boden (1996) argued that people with high, not low, self-esteem are most prone to interpersonal violence. They proposed that people with a relatively tenuous hold on their high self-regard respond to ego threat by directing anger outward instead of lowering their opinion of themselves. A review of relevant evidence revealed that people with high self-esteem, especially those with an inflated sense of self-worth, often react violently upon encountering self-esteem threat.

Ancillary Characteristics of Self-Esteem

HSE and LSE people can be distinguished on characteristics other than self-regard. Self-esteem is positively associated with optimism about the personal future and, relatedly, inversely associated with caution.

Optimism. Compared to HSE individuals, LSE people are pessimistic about their future. Scheier and Carver (1985) reported a substantial relation ($r = .48$) between their measure of dispositional optimism and self-esteem. McFarlin and Blascovich (1981) explored the relations among self-esteem, feedback and anticipated performance. They gave low, moderate, and high self-esteem people an anagrams task and then randomly assigned them to a failure feedback, no feedback, or success feedback condition. Participants were subsequently told about an unrelated task on which they would be evaluated and were asked to forecast their performance. Regardless of condition, those with low self-esteem made less optimistic predictions than those with high self-esteem. McFarlin and Blascovich also obtained an interaction with feedback condition such that performance predictions varied

most as a function of self-esteem in the failure condition. Following failure, low self-esteem people were much more pessimistic about their future performance than those with high self-regard.

Caution. HSE and LSE people differ also in displays of caution (Baumeister, Tice, & Hutton, 1989). The more pronounced self-esteem difference in optimism under conditions of failure observed in the McFarlin and Blascovich (1981) study demonstrates this tendency. Having just experienced failure, LSE participants did not want to risk not meeting their expectations on a subsequent task.

Josephs, Larrick, Steele, and Nisbett (1992) illustrated LSE individuals' cautious nature in a gambling paradigm. People, in general, are risk averse. Most of us prefer a certain outcome over a more risky one that would afford an equal or somewhat greater payoff (Kahneman & Tversky, 1979). Risk aversion results partly from anticipated regret (Loomes & Sugden, 1986). Josephs et al. theorized that LSE people are relatively self-protective and thus should display more caution (i.e., risk aversion) when they anticipate experiencing regret. The researchers manipulated the prospect of experiencing regret by varying whether participants were told the outcome of their gambles. As hypothesized, LSE people exhibited more risk aversion than HSE individuals when feedback on their gambles was expected. There were no self-esteem differences when feedback was not expected. Knight and colleagues also demonstrated LSE people's cautious nature. In one study, participants were required to learn a relational rule among three numbers (Weiss & Knight, 1980). Participants were enjoined to report a solution only when they could do so confidently. Apparently displaying caution, LSE people searched for more information about the rule than did HSE people before offering a solution. A similar effect was obtained in a managerial setting (Knight & Nadel, 1979).

The Benefits of Optimism

The optimism of HSE people is beneficial. Armor and Taylor (1998) argued that optimism facilitates efficient accomplishment of tasks and aids in the maintenance of personal well-being. Sherman, Skov, Hervitz, and Stock (1981) demonstrated that participants induced to make a relatively optimistic prediction of performance on an experimental task subsequently achieved a higher score than control participants. In a more naturalistic paradigm, Sherman (1980) induced participants to predict that they would engage in demanding socially desirable behaviors (e.g., spend three hours collecting for the American Cancer Society). Such optimistic forecasts increased the probability of their carrying out the prosocial acts. Also, in a study of HIV positive men, Taylor et al. (1992) found that those who were unrealistically optimistic about the likelihood of their avoiding acquiring AIDS more often tried to better their own health than those who were not optimistic (see also Bandura, 1997). By this view, then, caution and pessimism are not advantageous characteristics. Rather, optimism and a mentality of “damn the torpedoes, full speed ahead” is beneficial.

Limits to the Benefits of Optimism

Just as high self-regard can be related to negative consequences (e.g., Baumeister et al., 1996), the benefits of optimism are limited. Indeed, extreme amounts of optimism about one's future can be harmful. Baumeister (1989) noted several historical examples of hubris leading to bad ends (e.g., the deaths of overconfident magicians). Moreover, to the extent that people have optimistic expectations for success in situations where failure is inevitable, only frustration will result. Feather (1961, 1962) demonstrated that people who had anticipated success persisted at insoluble tasks. In one study, participants were told that a task was either easy or difficult. Unbeknownst to them, the task had no solution. Those participants who

were motivated to find a solution and who had been led to believe that a solution was easy (i.e., those who had optimistic expectations), made more and longer fruitless attempts.

To the extent that an optimistic orientation precludes one from focusing on potential obstacles, it will not always be the best self-regulatory strategy. For example, in my work on people's predictions of task completion, I have found a consistent tendency for individuals to base their forecasts on optimistic scenarios (i.e., stories) of task completion. As a result, their predictions are typically too optimistic. Moreover, I found that predictors ignore self-generated information concerning potential setbacks they might face (Newby-Clark, Ross, Buehler, Koehler, & Griffin, 1999). In some cases, such an optimistic bias is not harmful. An overly optimistic prediction about when the laundry will be finished results only in dirty and odorous clothes. In contrast, a rosy and inaccurate forecast by the head of a large construction project can be costly (Hall, 1980).

There is arguably no benefit, though, to thinking about the characteristics of an inevitable negative event. By definition, such an occurrence is one over which a person has little control. If one had control over an event with negative implications for the self, one would typically act to prevent it. Thus, rumination about upcoming negative episodes may produce nothing more than unnecessary discomfort and consternation. On the other hand, a lack of such anticipation can leave one unprepared. A possible case in point is Lehman and Taylor's (1988) study of earthquake readiness. Students living in structurally unsound dormitories had taken no preparatory measures. This absence of anticipatory coping was not due to their underestimating the probability of an earthquake in the immediate future. When asked, they overestimated the likelihood of a major quake occurring in the subsequent five months. Though an earthquake is not avoidable, anticipatory coping (e.g., purchasing a first aid kit) can be efficacious. Unfortunately, someone with an optimistic orientation—who does

not often contemplate the possibility of an earthquake and its tragic effects—is less likely to engage in such preparatory behavior.

Often, merely knowing what will happen as an aversive event unfolds can be an effective coping strategy. J. Johnson and Leventhal (1974) studied individuals who were required to undergo an endoscopic examination for medical reasons. Providing participants with accurate information about the pain they would experience during the procedure significantly reduced the amount of tranquilizer required and frequency of gagging. J. Johnson (1973) obtained the same result with respect to the inducement of ischemic pain (blood loss in the forearm). Participants who were given information about the sensations they would experience during the procedure (i.e., aching, tingling and numbness) reported less pain than those in an irrelevant information control condition (see Leventhal, Brown, Shacham, & Engquist, 1979, for similar findings). In sum, thinking about the consequences of a psychologically aversive event can be helpful. In some cases, anticipating what will occur can be effective. In other instances, awareness of a possible negative occurrence can lead to beneficial preparatory behavior.

Hypotheses

Compared to people with high self-esteem, people with low self-esteem are pessimistic. They more readily anticipate negative future episodes and less readily anticipate positive future episodes. Logically, this increased readiness to contemplate aversive eventualities affords LSE people more opportunity to engage in anticipatory coping. Because they have fulfilled the necessary condition of contemplating the possibility of a particular misfortune befalling them, they could (if so disposed) begin to prepare for the aversive consequences of the event. Moreover, the very personality characteristics that often produce no benefit for LSE people will result in their engaging in anticipatory coping more than HSE individuals. Just as an optimistic and proactive orientation on the part of HSE individuals

leads to goal focus and a heightened probability of goal achievement, the cautious orientation of LSE people (Josephs et al., 1992) results in their preparing for unfortunate circumstances.

The probability of a particular future aversive event can vary from highly unlikely to certain. In general, people should prepare more for a likely than an unlikely negative occurrence. I propose that LSE people will be less sensitive to the probability of an aversive event than HSE individuals. HSE individuals' preparatory behavior should substantially differ as a function of the odds of a negative future occurrence. In contrast, LSE individuals' cautious nature should lead them to less dramatically decrease anticipatory coping for improbable, compared to probable, events. By implication, self-esteem differences in anticipatory coping should be more pronounced when an aversive event is relatively improbable. HSE people should prepare less than LSE people particularly when an aversive event is unlikely.

Goals of This Investigation

Though previous studies suggest a link between self-esteem and optimism, my claim that LSE individuals readily anticipate negative events is not completely supported by previous research. McFarlin and Blascovich (1981) found self-esteem differences in optimism for a particular experimental task. It is not clear that such differences exist generally. Moreover, though a link between self-esteem and dispositional optimism has been established, the construct as measured by Scheier and Carver (1985) is not defined exclusively in terms of thinking about the future (e.g., one item reads, "I always look on the bright side of things.") Thus, I will attempt to demonstrate that HSE and LSE people differ fundamentally in their orientation toward the future. I will also test my hypothesis that LSE people engage in more anticipatory coping than HSE individuals, especially when an aversive event is relatively unlikely.

Overview of the Studies

In Study 1, I used a response latency paradigm to test my hypothesis that LSE and HSE individuals differ in their readiness to anticipate positive and negative future events. Also, I determined whether they differ in the recall of the personal past. In Study 2, I sought additional evidence that LSE and HSE people differ in their readiness to think about negative and positive future events. I instructed LSE and HSE participants to imagine that a positive and negative event was certain to occur. Importantly, I did not ask participants to envision negative events that are, in principle, unavoidable. Rather, they wrote about success and failure in romance and academics. Thus, Study 2 was constructed to model circumstances in which proactive coping efforts have not met with success. I gathered both open-ended and close-ended data concerning participants' thoughts and feelings. I also investigated anticipatory coping by asking participants how they would cope with the negative episodes. In Study 3, I determined how LSE and HSE individuals prepare for a physically painful stimulus that is more or less likely to occur.

Study 1

Newby-Clark and Ross (1999) investigated individuals' self-generated characterizations of the personal past and future. They used a response latency paradigm to explore differences in the readiness with which people recall and anticipate positive and negative events (Newby-Clark & Ross, 1999, Study 3). In this study, I use their methodology and attempt to demonstrate self-esteem differences in thoughts about the personal future. I hypothesize that LSE people more readily anticipate negative events, and less easily anticipate positive events, than HSE individuals. If my hypothesis is correct, then, LSE people should think of negative future events more quickly than HSE individuals (and vice versa for positive future events).

For purposes of exploration, I also asked participants to recall positive and negative past episodes. A self-esteem difference in which LSE people more readily recall negative events than HSE people (and vice versa for positive events) would be understandable. Perhaps LSE individuals' pessimism and caution is reflected in the kinds of past events that most easily come to mind. Alternatively, people with low self-esteem may have had more unfortunate experiences than HSE individuals and, thus, such episodes are more cognitively available.

Study Overview

In this computer-driven study, participants were asked to recall and anticipate both positive and negative events. Because self-presentation and self-disclosure concerns could interact with one or all of event valence, time period, and self-esteem, participants were not required to report the content of their thoughts. Rather, they were instructed to think of one of the four types of events (i.e., future/positive, future/negative, past/positive, past/negative) and indicate when they had done so. Participants' response latencies were recorded by the computer. They also answered questions regarding the emotional positivity of the event.

Method

Participants

Thirty-eight University of Waterloo undergraduates² (15 men, 23 women) participated individually in the study and received either course credit or \$5.00.

Procedure

Premeasure of self-esteem. At a mass testing session some weeks prior to the main study, participants filled out the Rosenberg (1965) self-esteem scale (Self-esteem scores: M = 62.77; SD = 12.85; Minimum = 44; Maximum = 89). On a 9-point scale, with end-points labeled Very Strongly Disagree and Very Strongly Agree, participants responded to items such as, "I feel that I have a number of good qualities" and "I certainly feel useless at times [reverse scored]."

The main study. Upon arrival, participants were told that the study involved thinking about the past and future, and that the entire experiment would be conducted on a computer (a Macintosh SE). With the knowledge that the research assistant was available if needed, participants read and followed instructions on the computer screen.

Participants were informed that they would be asked to remember events from their past and anticipate events that were likely to occur in their future. The instructions further informed participants that the remembered and anticipated events were to be personally significant—that is important to participants and involving them in some way. They were told that one of four cues would appear in the middle of the screen and that they were to remember or anticipate, as quickly as they could, an event that satisfied the characteristics of the cue, and click the mouse button when they had done so. They were also informed that the computer would go on to the next trial if they did not respond within one minute of cue

²Some of the participants in the current study were also included in Study 4 of Newby-Clark and Ross (1999). Newby-Clark and Ross did not analyze for self-esteem in that study and, in fact, self-esteem scores for three of the 25 participants were not known. Sixteen additional participants were recruited and went through the procedure, resulting in a total of 38 participants for the current study.

presentation. The cues represented the four experimental conditions: Past Positive, Past Negative, Future Positive, and Future Negative. Participants were told that they would not be asked to report the content of the events they remembered and anticipated, although they would be asked questions about each event.

After participants read the instructions, they went through four practice trials, which were followed by 20 experimental trials. The four practice trials exposed participants to each of the four cues in a random order. The remaining 20 trials contained five cues of each type, also in a random order. Participants began a trial by clicking the mouse button. A cue then appeared and remained on the screen until the mouse was clicked or one minute passed. If participants clicked the mouse button within one minute, their response latency was recorded. They then rated how happy and sad they were/would be on a ten-point scale where 1 meant Not At All and 10 meant Extremely. Participants indicated which number applied, and then clicked a button labeled 'Submit' in order for the computer to record their response. Before clicking the 'Submit' button, participants had the opportunity to change their response.

Results and Discussion

Participants' five responses for each of the four event types were averaged. Data from practice trials were not included in the analyses. One participant did not respond within one minute on one past/positive trial. Four participants did not respond within one minute on one past/negative trial, and one participant did not respond within one minute on two past/negative trials. One participant did not respond within one minute on one future/positive trial. Two participants did not respond within one minute on one future/negative trial, and two participants did not respond within one minute on two future/negative trials. Data from those 14 trials were excluded from the calculation of mean reaction times. Note that no participant was excluded from analyses on the basis of the one minute cutoff. Sex of participant did not qualify any of the findings reported below.

Analysis Strategy

Because self-esteem was a continuous variable in this study, I conducted criterion-scaled regression analyses in which event valence (positive vs. negative) and time period (past vs. future) were within subjects factors, and self-esteem was a continuous between subjects factor (Pedhazur, 1982). Thus, I conducted Event Valence (positive vs. negative) X Time (past vs. future) X Self-Esteem (continuous factor) mixed analyses.

Manipulation Check: Event Positivity

It was first necessary to ensure that participants did, indeed, think of affectively positive and negative events when asked to do so, and that positivity ratings did not interact with self-esteem. For all of the four event types, the correlation between the sadness and happiness measures were negative and significant ($|r|'s > .36$, $p's < .05$). Thus, sadness scores were reversed and averaged with happiness scores. An Event Valence X Time Period X Self-Esteem analysis revealed a main effect for event valence, $F(1, 36) = 1111$, $p < .001$. Participants rated the positive events as more positive ($M = 8.94$) than the negative events ($M = 2.69$). There was also a nonqualifying Event Valence X Time interaction, $F(1, 36) = 13.24$, $p < .001$. Positive future events had greater positivity scores ($M = 9.09$) than positive past events ($M = 8.79$), and negative future events had lower positivity scores ($M = 2.40$) than negative past events ($M = 2.98$; both $t's > 2.80$, both $p's < .01$). Importantly, there were no effects for self-esteem ($F's < 1$).

Response Latency

The response latency data were logarithmically transformed because the distributions were positively skewed (raw means are reported). The analysis revealed a main effect for time, $F(1, 36) = 7.55$, $p < .01$. Participants more readily anticipated future events ($M = 8.21$ seconds) than they recalled past occurrences ($M = 9.25$ seconds). I also obtained an Event Valence X Time Period interaction, $F(1, 36) = 9.41$, $p < .01$. There was no valence effect for

past events ($\underline{M} = 8.96$ seconds for positive events and $\underline{M} = 9.54$ seconds for negative events; $t < 1$), but there was a difference for future events, $t(38) = 3.08$, $p < .01$, such that positive future events were anticipated more quickly ($\underline{M} = 7.42$ seconds) than negative future events ($\underline{M} = 9.00$ seconds).

The Event Valence X Time Period X Self-Esteem interaction was also significant, $F(1, 36) = 4.29$, $p < .05$. Because my main research question concerned LSE and HSE individuals' thoughts about the future, I conducted separate Event Valence X Self-Esteem analyses for the past and future. The analysis for the past revealed no effect for event valence ($F < 1$) and no significant self-esteem effects (all F 's < 1). For the future, there was a significant main effect of valence, $F(1, 36) = 10.97$, $p < .01$, such that response latencies were shorter for positive events ($\underline{M} = 7.42$ seconds) compared to negative events ($\underline{M} = 9.00$ seconds). Importantly, there was also a significant Event Valence X Self-Esteem interaction, $F(1, 36) = 6.72$, $p < .025$.

To investigate this interaction further, I conducted a regression analysis in which self-esteem score was the criterion and the future/positive and future/negative response latencies were entered simultaneously. The overall solution was significant, $F(2, 35) = 3.63$, $p < .05$, and each beta weight was significant and in the hypothesized direction. For future/positive events, higher self-esteem was associated with faster response latencies, $\beta = -0.52$, $t(35) = 2.26$, $p < .05$. For future/negative events, higher self-esteem was associated with slower response latencies, $\beta = 0.61$, $t(35) = 2.66$, $p < .025$.³

I next separately characterized LSE and HSE individuals' future orientation.

Participants were split into high and low self-esteem groups ($\underline{Mdn} = 61$; see Figure 1). As

³I also conducted a regression analysis in which all four response latencies were entered simultaneously. The response latencies for the future remained significant and in the hypothesized directions, $\beta = -0.70$, $t(33) = 2.17$, $p < .05$, for future/positive; and $\beta = 0.70$, $t(33) = 2.14$, $p < .05$, for future/negative. Response latencies associated with the past were not significant predictors of self-esteem and the signs of the beta weights were opposite to what might have been expected ($\beta = 0.30$ for positive past events and $\beta = -0.23$ for negative past events; t 's < 1).

suggested by Figure 1, there was no event valence effect for LSE individuals ($M = 8.44$ seconds for positive events and $M = 8.24$ seconds for negative events; $t < 1$), and there was an effect for HSE participants—they more quickly anticipated positive ($M = 6.40$ seconds), compared to negative ($M = 9.76$ seconds), personally significant future events, $t(18) = 4.58$, $p < .001$.

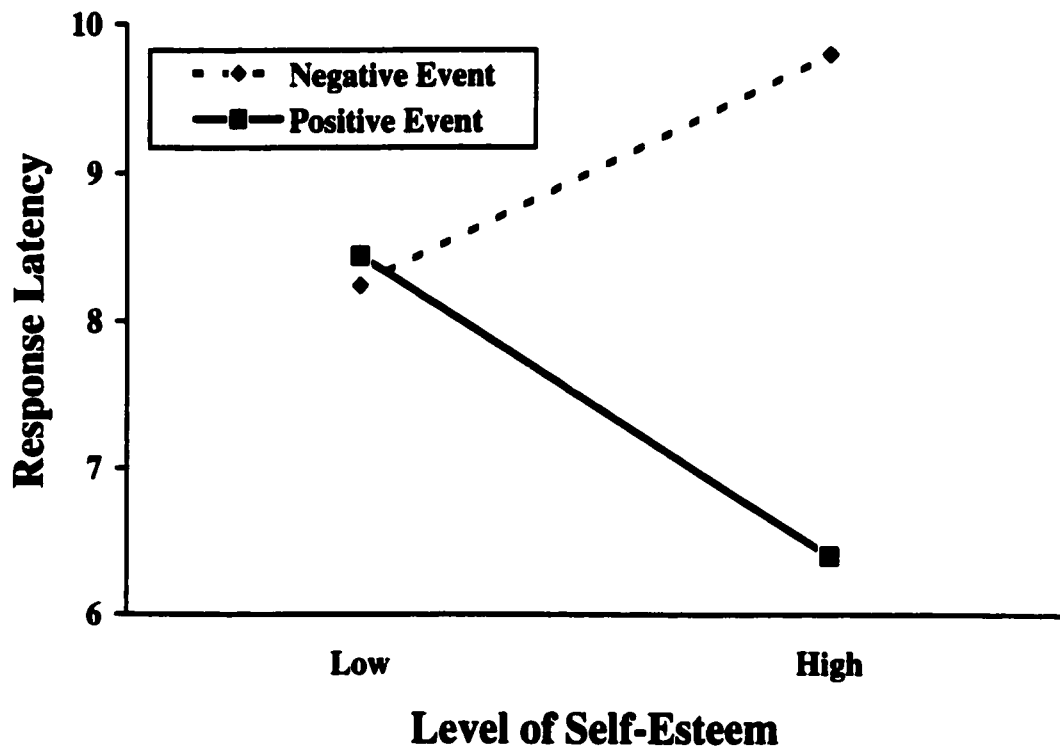


Figure 1. Response latency (in seconds) for future events as a function of event valence and level of self-esteem.

Summary

As hypothesized, LSE respondents were faster than HSE individuals in anticipating negative events, and HSE people were faster than LSE people in anticipating positive events. This finding suggests that LSE and HSE people differ in their readiness to think about positive future and negative episodes. Also, there were no self-esteem differences in the ease with which past episodes were recalled. Although it was plausible that, compared to HSE participants, LSE people would more quickly recall negative past episodes (and vice versa for positive past events), no supporting evidence was obtained here.

Study 2

Due to the design of Study 1, it was not possible to determine what kinds of events participants generated. Perhaps the response latency effects were the product of self-esteem differences in event content. Though there were no self-esteem differences in affective extremity, other differences in content (such as topic) were possible confounds. In Study 2, I addressed shortcomings of the first and investigated LSE and HSE individuals' thoughts about two important aspects of people's lives. Participants were instructed to anticipate one positive and one negative future event, the topics of which were predetermined. They were instructed to anticipate events related to romance and academic achievement.

To this point, I have not distinguished between LSE and HSE people's propensity to generate positive and negative forecasts (e.g., "I will meet the man of my dreams") and the ease with which they envision the details of such events (e.g., "I will sweep him into my arms"). The readiness with which LSE people think of negative future episodes could be reflected in their being able to envision the disagreeable particulars of such occurrences in relatively great detail (and vice versa for agreeable details in positive future events). Thus, I measured the amount of positive and negative descriptive and emotional detail provided by participants for positive and negative events.

I also investigated self-esteem differences on two related measures. If LSE and HSE people differ in the readiness with which they think of positive and negative events, they might also differ in the frequency with which they think of such episodes. Indeed, ease of thinking can result from frequency of thought (Anderson, 1983; Smith, 1989). A direct inquiry about frequency of thought could yield a pattern of results similar to the response latency effects of Study 1. Granted, individuals do not have perfect access to their own cognitive machinations (Nisbett & Wilson, 1977), and their recall of past thoughts is not necessarily exact (Ross, 1989). It is not clear, though, why such inaccuracies in self-

knowledge should produce a similar pattern of results to that found in Study 1. In the current study, then, participants were asked about the frequency with which they thought about future positive and negative, romantic and academic, personally significant events. Also, HSE and LSE people could differ in their likelihood judgments of positive and negative future events. As Tversky and Kahneman (1974) demonstrated, probability judgments are often based on ease of imagining. I investigated this possibility by asking participants to rate the likelihood of the events they wrote about.

In Study 1, I did not investigate self-esteem differences in anticipatory coping. This lacuna is addressed in the current study. I investigated one of the two situations in which anticipatory coping is relevant—namely, when proactive coping efforts have failed. Participants reported how they intended to ameliorate the consequences of a negative future event.

Just as anticipatory coping can blunt the consequences of an aversive future event, certain behaviors can enhance the agreeable qualities of a positive future event. Thus, participants were asked how they would make the most of a positive romantic or academic episode. I hypothesize that LSE individuals, when instructed to anticipate how they would cope with an aversive future event, will generate a greater number of coping behaviors than HSE people. In contrast, the opposite pattern should hold for an instruction to list methods by which an already positive event could be made more enjoyable.

Study Overview

Participants were recruited for possessing either low or high self-esteem. This selection method was used to reliably sample those of interest to the current investigation. The design of Study 1 lacked control for self-esteem differences in mood and personal history. To control for mood, participants first filled out the Positive and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988). To investigate and control for self-esteem

differences in personal history, participants were asked about their previous experience in academics and intimate relationships. In the main part of the study participants described a positive and negative future event and rated it on various dimensions. Also, they answered a coping question for negative events, and an enhancement question for positive events.

Method

Participants

Participants were 59 University of Waterloo undergraduate students (22 men and 37 women) enrolled in Introductory Psychology. They participated in groups of up to four at a time and were remunerated with either course credit or \$7.00.

Participant Selection

Participants were selected for inclusion in the study based on their responses to the Rosenberg self-esteem scale. These responses were obtained from mass testing booklets collected at the beginning of term. Those in the lower quartile of the mass testing distribution were identified as potential low self-esteem participants and those in the upper quartile were identified as potential high self-esteem participants. Thirty-one participants formed the low self-esteem group (Self-esteem scores: $M = 50.97$; $SD = 7.77$; $Minimum = 31.00$; $Maximum = 59.00$) and 28 participants formed the high self-esteem group ($M = 83.14$; $SD = 3.43$; $Minimum = 78.00$; $Maximum = 89.00$).

Procedure

Upon arrival, participants were informed that, as they had been told on the phone, the study concerned how people think about the future. Their task would be to imagine that various events were certain to occur and subsequently answer questions about those events. After written consent was obtained, the experimenter gave participants a questionnaire booklet and told them they had the next hour (or more if needed) to complete the materials.

When they finished filling out the materials, participants were debriefed, remunerated, and excused.

Materials

Study materials consisted of one questionnaire booklet with four sections. The first section of the booklet contained the PANAS. Participants indicated how they felt “right now” by rating 20 adjectives (e.g., strong, upset) on a 1 to 5 scale, with the endpoints labeled Very Slightly or Not At All and Extremely, respectively. The second section was one page of questions that determined participants’ status on personal history variables that were related to the two topics of the current study (academic achievement and intimate relationships). For example, participants were asked about the number of relationships they had experienced and the number of times they had finished in the top five percent of their high school and university classes.

The third and fourth sections comprised the core of the study. In each section, participants were asked questions about one event. Participants wrote about a positive event in one section and a negative event in the other. Also, participants wrote about an academic event in one section and an event associated with intimate relationships in the other. The order of event valence and event topic was randomly determined and counter balanced between participants. Thus, participants were randomly assigned to one of four arrangements of materials: positive academic/negative romantic, positive romantic/negative academic, negative academic/positive romantic, or negative romantic/positive academic. The positive academic event instructions read, “We would like you to imagine that you have just learned that you have scored in the top 5% of your class on an important university exam.” The negative academic event instructions were as follows: “We would like you to imagine that you have just learned that you failed an important university exam.” For the positive romantic event, the instructions stated: “We would like you to imagine that you have just realized that

you and your romantic partner are ‘falling in love’ with each other.” The negative romantic event instructions read: “We would like you to imagine that your romantic partner is ending the relationship.”

Within each section, participants were first instructed to imagine that a particular event was certain to occur and write a detailed description of that event. Next, in the case of a negative episode, participants were instructed to write about how they would cope with the event. In the case of a positive occurrence, participants were instructed to write about how they would make the event in question as enjoyable as they possibly could (i.e., enhancement question). Subsequently, participants answered a series of close-ended questions about the event. On a 10 point scale (1 to 10), with end points labeled Not At All and Extremely, respectively, participants rated the anticipated affective positivity of the event (i.e., how happy and sad they would be), how frequently they thought about such an event, and how likely it was that the event would actually occur. Thus, questions took the form, “If this event happens, I will feel ____ SAD.” Participants were to fill in the blank with a number from 1 to 10. They were also asked to indicate whether an event, similar to the one they had just described, had ever occurred in their lives (yes or no). This question was included in materials after data from the first four participants had been collected.

Event Descriptions Coding

All event descriptions were transcribed onto a computer and separated into individual thought units. A coder categorized the statements using the following coding scheme: (a) positive detail, (b) negative detail, (c) positive emotion, (d) negative emotion. A statement was categorized as a positive or negative detail if its meaning was unambiguously positive or negative in tone (e.g., “He smiles and looks into my eyes”; “I realize that I have failed”). Similarly, a statement was categorized as a positive or negative emotion if it referred to an emotion directly (e.g., “I begin to feel overjoyed”) or by way of a behavioral description (e.g.,

“I start to cry.”) For negative events, a category for coping was added because, upon reading participants’ event descriptions, it became apparent that some respondents spontaneously mentioned coping behaviors. Similarly, a category for enhancement was added to the coding scheme for positive events. Adjacent statements were sometimes redundant. In such cases, only one of the statements was categorized. A second coder categorized the coded statements for one quarter of the sample. An acceptable level of reliability was achieved (80%). For the coping and enhancement questions, the number of transcribed statements (i.e., separate thoughts) were counted.

Results

Preliminary Analyses

Sex of participant and counterbalancing effects. Sex of participant and counterbalance factors did not qualify any of the findings reported below.

Current mood. Self-esteem differences in mood were first investigated. The positive and negative affect subscales of the PANAS were internally consistent ($\alpha = .80$ and $\alpha = .84$, respectively). Typical of findings in the literature, the subscales were not correlated, $r(57) = .01$, ns. There were no self-esteem differences on either scale (both t ’s < 1). Thus, scores on the PANAS subscales ($M = 2.96$ for positive affect and $M = 1.47$ for negative affect) were not used as covariates in the current analyses.

Self-esteem differences in personal history. It was also necessary to determine whether those with low and high self-esteem differed in their personal history. For romantic history, HSE individuals reported a greater number of past romantic relationships ($M = 3.86$) than did LSE respondents ($M = 2.29$), $t(57) = 2.38$, $p < .025$. For academic history, HSE individuals reported finishing in the top five percent of their class in exams and overall ($M = 7.96$ and $M = 9.84$ respectively) more often than LSE individuals ($M = 3.00$ and $M = 4.38$; t ’s > 2.30 , p ’s $< .025$). The two academic variables were highly correlated, $r(50) = .86$, $p < .001$,

and were thus aggregated for subsequent analyses. For the similar previous experience question, a Previous Experience (yes vs. no) X Self-Esteem (high vs. low) chi-square analysis was conducted separately for positive and negative events. In the case of positive events, self-esteem and previous experience was related, $\chi^2(1, N = 55) = 8.97, p < .01$. Eighty percent of HSE people reported previous experience with positive events similar to those of focus in the current study, whereas 40% of LSE individuals reported such experience. For negative events, there was no apparent relation between self-esteem and reports of previous experience, $\chi^2(1, N = 55) = 0.66, ns$.

Analysis Strategy

Because there were self-esteem differences on relevant personal history variables, analyses of covariance were conducted. Inclusion of the covariates did not qualify any of the findings reported below. Also, Event Valence X Self-Esteem ANOVA's were conducted separately for each type of event (academic and romantic). In these analyses, event valence was a between subjects variable. There were no differences between the overall and event specific analyses.

Manipulation Check: Event Positivity

For both positive and negative events, participants' ratings of anticipated happiness and sadness were negatively correlated (both $|r|$'s $> .48$, both p 's $< .001$). Accordingly, anticipated sadness scores were reversed and averaged with anticipated happiness scores. An Event Valence X Self-Esteem (high vs. low) mixed ANOVA revealed only a main effect for event valence, $F(1, 57) = 948.7, p < .001$. As expected, participants' anticipated positive affect for a budding romantic relationship or achieving a high grade ($M = 9.53$) was greater than that anticipated for a romantic break-up or failing an important exam ($M = 2.00$; other F 's < 1).

Event Detail

An Event Valence (positive vs. negative) X Self-Esteem (high vs. low) mixed ANOVA was conducted on the number of transcribed statements. A main effect for self-esteem emerged, $F(1, 57) = 5.96, p < .025$. LSE people wrote more ($M = 36.00$) than HSE participants ($M = 27.84$; other F 's $< 1.50, p$'s $> .20$). Because of this self-esteem difference, coded statements were transformed into proportion scores.⁴

Positive and negative details. The mean proportion of positive and negative details coded for positive and negative events was submitted to an Event Valence (positive vs. negative) X Detail Type (positive vs. negative) X Self-Esteem (high vs. low) mixed ANOVA (see Table 1 for the means). There was a significant main effect for event valence, $F(1, 57) = 6.94, p < .025$. Participants reported more positive and negative details for positive events ($M = .30$) than for negative events ($M = .23$). There was a significant Detail Type X Event Valence interaction, $F(1, 57) = 170.5, p < .001$, and a significant Event Valence X Detail Type X Self-Esteem interaction, $F(1, 57) = 4.05, p < .05$.

I next tested my hypothesis that HSE and LSE differed in the amount of positive details they supplied for a positive event. A Detail Type X Self-Esteem analysis for positive events revealed a main effect for detail type, $F(1, 57) = 71.97, p < .001$. Proportionally more positive details ($M = .24$) than negative details were mentioned ($M = .06$). The Detail Type X Self-Esteem interaction was not significant, $F < 1$.⁵

I then turned to my self-esteem hypothesis for negative events. A Detail Type X Self-Esteem ANOVA revealed a main effect for detail type, $F(1, 57) = 67.19, p < .001$ ($M = .05$ for positive details vs. $M = .18$ for negative details) and a Detail Type X Self-Esteem interaction, $F(1, 57) = 4.22, p < .025$. As hypothesized, LSE individuals mentioned more

⁴ Cohen and Cohen (1983) suggest a probit transform for proportion scores. An analysis of the transformed proportion scores yielded the same pattern of means and effects as is reported here.

⁵ A subsequent comparison revealed no self-esteem difference for positive details, $t(57) = 0.79, p > .40$.

negative details for negative events than did HSE participants, $t(57) = 1.72$, $p < .05$ (one-tailed). There was no self-esteem difference for positive details, $t(57) = 1.00$, $p > .30$.

Table 1

Mean Proportion of Positive and Negative Details as a Function of Event Valence, Detail Type, and Level of Self-Esteem

Event Valence	Level of Self-Esteem			
	Low		High	
	Detail Type		Detail Type	
	Positive	Negative	Positive	Negative
Positive	.25	.06	.23	.06
	(.13)	(.06)	(.12)	(.08)
Negative	.04	.21	.06	.16
	(.04)	(.12)	(.08)	(.10)

Note. For the LSE group, $n = 31$; for the HSE group, $n = 28$. Standard deviations in parentheses.

Positive and negative emotions. The proportion of positive and negative emotional statements for positive and negative events were analyzed in an Event Valence (positive vs. negative) X Emotion Type (positive vs. negative) X Self-Esteem (high vs. low) mixed ANOVA. Self-esteem did not interact with the overall pattern of results (F 's < 1). There was a main effect for event valence, $F(1, 57) = 4.55$, $p < .05$, though its magnitude was small. Compared to positive events ($M = .07$), participants mentioned emotions more when describing negative events ($M = .08$). There was also a main effect for emotion type, $F(1, 57)$

= 7.55, $p < .01$. Participants made slightly more negative emotional statements ($M = .09$) than positive emotional statements ($M = .06$). Finally the Event Valence X Emotion Type interaction was highly significant, $F(1, 57) = 162.9$, $p < .001$. Subsequent t-tests revealed that there were more mentions of positive emotions in positive events ($M = .11$) than in negative events ($M = 0.02$) and more mentions of negative emotions in negative events ($M = .15$) than in positive events ($M = .01$; both t 's > 7.20 both p 's $< .001$). Within event comparisons revealed the expected significant differences for emotion type (both t 's > 8.30 , both p 's $< .001$).

Frequency of Thoughts

Individuals' ratings of thought frequency were submitted to an Event Valence X Self-Esteem mixed ANOVA. There was a main effect for event valence, $F(1, 57) = 7.24$, $p < .01$. Overall, participants reported thinking of positive events more frequently ($M = 5.41$) than negative events ($M = 4.20$). There was also an Event Valence X Self-Esteem interaction, $F(1, 57) = 4.96$, $p < .05$. As can be seen in Table 2, the pattern of means is highly similar to the response latency results of Study 1. Between group self-esteem comparisons, though, were not significant (both t 's < 1.60 , both p 's $> .10$). Subsequent comparisons revealed that whereas LSE individuals did not differ significantly in how often they thought about positive and negative events, $t < 1$, HSE participants reported they thought about positive events more often than negative events, $t(27) = 3.83$, $p < .001$.

Likelihood Judgments

An analysis of participants' likelihood judgments revealed the hypothesized Event Valence X Self-Esteem interaction, $F(1, 57) = 18.29$, $p < .001$. Like the frequency judgments, the pattern of means depicted in Table 3 are similar to the response latency results of Study 1. Low self-esteem participants judged negative events to be more probable than did high self-regard individuals, and vice versa for positive events (both t 's > 2.65 , both p 's $< .01$).

Table 2

Mean Ratings of Thought Frequency as a Function of Event Valence and Level of Self-Esteem

Event Valence	Level of Self-Esteem	
	Low	High
Positive	4.97 (2.81)	5.89 (2.79)
Negative	4.74 (3.07)	3.50 (2.78)

Note. For the LSE group, $n = 31$; for the HSE group, $n = 28$. Standard deviations in parentheses.

Analyses within each self-esteem group revealed a significant effect for HSE individuals, $t(27) = 4.22$, $p < .001$, such that they judged positive events to be more likely than negative ones. There was no significant difference for LSE people, $t(30) = 1.82$, $p > .05$

Table 3

Mean Likelihood Judgments as a Function of Event Valence and Level of Self-Esteem

Event Valence	Level of Self-Esteem	
	Low	High
Positive	4.84 (2.51)	6.50 (2.27)
Negative	6.00 (2.45)	3.75 (2.27)

Note. For the LSE group, $n = 31$; for the HSE group, $n = 28$. Standard deviations in parentheses.

Coping and Enhancement

I analyzed participants' spontaneous and elicited coping and enhancement statements in Response Type (coping vs. enhancement) X Self-Esteem (low vs. high) mixed ANOVA's. There were no effects for self-esteem on those measures.

Spontaneous statements. Analysis revealed only a main effect for response type, $F(1, 57) = 72.06$ $p < .001$ (other F 's < 1). Overall, there were more spontaneous mentions of coping behaviors ($M = .22$) than enhancement behaviors ($M = .07$; see Table 4). Self-esteem comparisons within each response type were not significant (t 's < 1.10 , p 's $> .25$).

Table 4

Mean Proportion of Spontaneous Coping and Enhancement Statements as a Function of Level of Self-Esteem

Response Type	Level of Self-Esteem	
	Low	High
Coping	.22 (.14)	.22 (.13)
Enhancement	.06 (.08)	.08 (.08)

Note. For the LSE group, $n = 31$; for the HSE group, $n = 28$. Standard deviations in parentheses.

Elicited statements. An ANOVA on elicited statements revealed only a main effect for response type, $F(1, 57) = 7.37$, $p < .01$. As with spontaneous statements, there were more coping ($M = 13.48$) than enhancement statements ($M = 11.02$; other F 's < 1.10 , p 's $> .30$). Self-esteem comparisons within each response type were not significant (t 's < 1 ; see Table 5 for the means).

Table 5

Mean Number of Elicited Coping and Enhancement Statements as a Function of Level of Self-Esteem

Response Type	Level of Self-Esteem	
	Low	High
Coping	12.97 (6.35)	14.04 (6.84)
Enhancement	11.42 (6.29)	10.57 (5.59)

Note. For the LSE group, $n = 31$; for the HSE group, $n = 28$. Standard deviations in parentheses.

Discussion

My hypothesis that LSE people, compared to HSE individuals, more readily anticipate negative future occurrences received some additional support. LSE participants wrote more negative details for a negative event than HSE respondents. Contrary to my hypothesis, HSE people did not display the reverse pattern for positive details of positive events. In addition, predicted differences in positive and negative emotional detail did not materialize. I also note that the self-esteem difference in negative details for negative events could be due to something other than the readiness with which LSE and HSE people think of aversive events. Perhaps LSE participants expended more effort in generating negative details than HSE people. It is not clear, though, why they would do so. Although LSE people are relatively pessimistic about their future, they prefer that it go well (McFarlin & Blascovich, 1981). Thus, it is not obvious why LSE participants would have worked harder to paint a more miserable picture of their future

Hypothesized self-esteem differences in frequency of thought were not found. I note, though, the similarity of the frequency of thought means to the response latency results of Study 1. LSE participants reported virtually no frequency of thought difference between positive and negative events, and HSE people apparently thought about positive events more than negative. It appears that a positive personal future, compared to a negative one, is more often on the mind of HSE individuals. Also as hypothesized, there were large differences in HSE and LSE participants' judgments of the likelihood of future positive and negative events. Reflecting the response latency effects of Study 1, LSE respondents apparently judged positive and negative future events to be equally likely, whereas HSE people stated that positive events were more probable than negative events.

Self-esteem differences in personal history were obtained for romantic and academic events. Those differences, though, did not account for any of the effects obtained in Study 2. It would appear that, regardless of what they experienced previously, LSE and HSE people differ fundamentally in the way they think about their future. At least with respect to hypothetical future events, LSE people are more attuned to contemplating and anticipating personally threatening events, and HSE people are inclined to the opposite.

My coping and enhancement hypotheses was supported neither for spontaneous mention of coping and enhancement behaviors, nor for elicited statements. LSE individuals' propensity to anticipate negative future events did not translate into increased anticipatory coping. If anything, HSE individuals appear to be at a relative advantage. They have an optimistic orientation and engage in anticipatory coping that is statistically indistinguishable from that of LSE people. Moreover, the means for elicited coping statements were opposite to what I predicted. Although not significant, HSE people made more coping statements than LSE individuals.

Study 3

Participants in Study 2 were instructed to imagine that a positive and negative event was certain to occur. Thus, they were engaging in anticipatory coping with the understanding that the aversive event in question was inevitable. It may be that HSE people are best able to engage in anticipatory coping under such circumstances. In other words, HSE people prefer not to dwell upon the possibility of a negative personal future. If, however, they are confronted with an aversive event, they may then marshal coping resources. Indeed, such a strategy on the part of HSE people could explain why a positive correlation between self-esteem and coping is often found (e.g., Jahanshahi, 1991; R. Johnson, et al., 1986).

My hypothesis concerning the relations among the probability of an aversive event, self-esteem, and anticipatory coping still stands. In general, people should prepare more for a probable than an improbable negative occurrence. Because LSE people are cautious (e.g., Josephs et al., 1992), their anticipatory coping behavior should be less attuned to the probability of an aversive event than HSE individuals' preparations. Specifically, LSE people should engage in more preparatory behavior than HSE individuals for a relatively improbable event. To test these propositions, I manipulated the perceived probability of a negative future event by telling participants that there was either a low or high probability that they would engage in an unpleasant task. There was a complementary high or low probability that they would engage in a comparatively pleasant task. The unpleasant task was a pain coping task and the pleasant task involved reward.

I attempted to expand upon my understanding of self-esteem differences in coping in two other ways. First, I investigated the other situation in which anticipatory coping is of interest: when an event is unavoidable and, thus, proactive coping is not relevant. Second, the anticipated aversive event in the current study was not hypothetical. Participants were faced with the possibility of actually experiencing a disagreeable episode. The dependent variable

was anticipatory coping. It was measured by determining the amount of time participants dedicated to preparing for the pain coping task.

Study Overview

The study consisted of two phases. In the first phase, participants were introduced to the general rationale of the study and the reward and pain coping tasks were described to them. Participants were told that the reward task involved solving anagrams for money and that the pain coping task involved the application of pressure to one's finger. Next, participants were led to believe they had a high probability (3 in 4) of engaging in the finger pressure task and a consequent low probability of performing the anagrams task (1 in 4), or vice versa.

In the second phase, participants were asked to indicate the actual and "subjective" odds that they would be assigned to either task. The actual odds question served as a manipulation check for probability condition. The subjective odds measure was included to determine whether any differences in preparation behavior could be attributed to people's impressions of the personal likelihood of being assigned to the finger pressure task (e.g., LSE individuals may possess a belief that they are doomed regardless of stated odds). Also, participants were asked to indicate which task they preferred. This measure allowed us to control for self-esteem or probability condition differences in preference (should any be found). Also, we expected the anagrams task to be preferred over the finger pressure task. Participants were given the opportunity to prepare for the reward task, the pain coping task, or both. In the case of the reward task, participants could practice anagrams and, in the case of the pain coping task, familiarize themselves with the sensations that they would experience during a finger pressure trial.

Method⁶

Participants

Participants were 93 University of Waterloo undergraduate students (39 men and 54 women) enrolled in Introductory Psychology. They were run individually in 75 minute sessions and remunerated with either course credit or \$10.00.

Participant Selection

Participants were selected for inclusion in the study based on their responses to the Rosenberg self-esteem scale. These responses were obtained from mass testing booklets collected at the beginning of term. Those in the lower quartile of the mass testing distribution were identified as potential low self-esteem participants and those in the upper quartile were identified as potential high self-esteem participants. Forty-nine participants formed the low self-esteem group (Self-esteem scores: $M = 49.45$; $SD = 9.44$; $Minimum = 15$; $Maximum = 61$) and 44 participants formed the high self-esteem group ($M = 82.61$; $SD = 3.44$; $Minimum = 78$; $Maximum = 90$). Both groups' self-esteem scores were similar to those of the second study.

Procedure

Phone contact. Participants were contacted by phone and informed that the study concerned how people prepare for their involvement with classic experimental tasks. They were further informed that they would be randomly assigned to engage in one of two experimental tasks. They were told that one of the tasks involved solving anagrams for financial reward and the second involved a pain coping task in which a finger pressure apparatus would be used. They were assured that, if they were assigned to the finger pressure task, they could withdraw from the procedure at any time, and the discomfort would cease immediately upon termination of the trial.

⁶Participants' ability to cope with the finger pressure task was also measured. Because there were no effects of self-esteem or experimental condition, the method, results, and discussion are presented in Appendix A.

The majority of contacted participants agreed to participate in the experiment (87%). Of the 15 people who refused to participate, eight (four LSE and four HSE respondents) refused prior to learning about the finger pressure task, and seven refused (four LSE and three HSE respondents) subsequent to learning about it.

Introduction to the tasks. Upon arrival, participants were reminded of the general purpose of the study as described on the phone. It was explained to participants that psychological researchers use a great variety of experimental procedures and there are a core set of procedures that are used quite frequently. They were further informed that:

We are studying two of these procedures. I will describe them to you in a moment. In this study, we're interested in measuring how people prepare for their involvement in these two procedures, and how that preparation relates to their performance on the two procedures. Now, in typical experiments, participants know what they'll be doing as soon as they walk into the lab. In other words, they know what is going to happen to them. In real life, though, people do not always know what is going to happen to them. We want to recreate that reality in the lab. So, in our study we have two different groups. In one group, as soon as they walk in the lab, participants are told which task they will be performing. In the other group, the task to which participants have been assigned is kept unknown for as long as possible. Now, you have been assigned to this last group. You will not know to which task you have been assigned until the last possible moment.

Let me describe the two classic tasks that are used in this study, either of which you might perform. One is called a reward task and the other is a pain coping task. The reward task involves solving anagrams for money. The pain coping task involves what is called a finger pressure apparatus. If you are assigned to the anagrams task, your job will be to solve as many anagrams as you can in ten minutes.

Anagrams are words in which the letters are jumbled. Your job will be to unscramble the letters to form a word. You will be rewarded fifty cents for every anagram that you solve. You will do the anagrams task on a computer. If you are assigned to the finger pressure task, you will put your finger in the apparatus and pressure will be applied to your finger for a 90 second trial (that's 90 seconds in total). Just to let you know, the finger pressure task has been used by many psychologists, and even though it does cause some discomfort, the discomfort ends immediately when your finger is released. Also, there are no long term side effects. At regular intervals throughout the finger pressure task, you will report the level of pain that you are experiencing.

In clear view was the finger pressure apparatus (see Figure 2) and a small plastic container half-filled with quarters and one and two dollar coins.

Random assignment cover story. In the next part of the experiment, the "logic" behind the random assignment procedure ostensibly used in this study was explained to participants. In addition, participants were actually randomly assigned to one level of the between subjects finger pressure probability factor (low probability vs. high probability). They were told the following (note that the high probability version of the instructions appears in parentheses):

We want to randomly determine which task you will be performing. As you may know, random assignment to experimental condition is really important in psychological research. Also, it is important to keep me blind to your task assignment for as long as possible. That way, it is less likely that my behavior will subtly influence you. Now, if my behavior did influence you, the results of the experiment

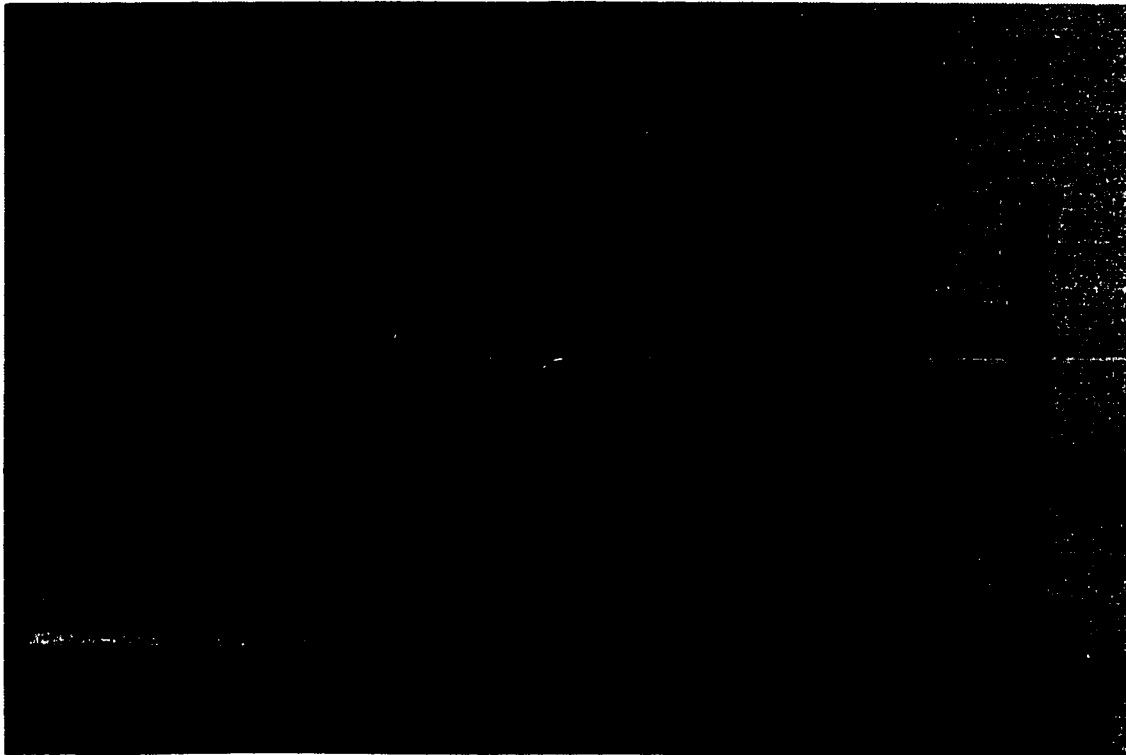


Figure 2. The finger pressure apparatus (strain gauge stimulator).

would be invalid. To randomly determine which task you will perform, you will draw a slip of paper from a box.

Now, at this point in the study, we need more people to participate in the anagrams task (finger pressure task) than the finger pressure task (anagrams task). We also, though, need to keep the experimental procedure random with respect to which task you will perform. So, we have decided to unevenly split the probability of your performing the tasks. Right now, the odds of your being in the finger pressure task are one in four (three in four) and the odds of your being in the anagrams task are three in four (one in four). Now, I will give you a summary sheet that outlines everything I have told you up to this point.

Preparation phase. After reviewing a summary sheet that outlined the main points of the experimenter's instructions, participants signed a consent form and moved on to the preparation phase of the study. They were told that the experimenters were interested in how people prepare for the two tasks given that:

... you do not know to which task you will be assigned. For this reason, I am going to give you the opportunity to familiarize yourself with either the anagrams task, the finger pressure task, or both. You will have a five minute preparation period for this purpose. Here is what will happen: On the computer, there is a program that will help you practice solving anagrams. The program will present an anagram for you to solve. There is a pad of paper and a pen beside the computer that you can use to make notes to help you along. Once you think you have solved the anagram, let the computer know, and it will display the answer. This practicing should help you to solve anagrams during the real trials should you be assigned to that task. In fact, the more you practice, the better you should do.

There is also a program that gives information about the sensations that people experience when they undergo a trial in the finger pressure apparatus. On the computer, you will see a series of 23 statements about the sensations experienced during the finger pressure task. Now, several studies have shown that if people are familiar with the kinds of sensations experienced during a painful procedure, it helps them to better cope with the experience. Note that during the five minute preparation period, you can switch between the two programs if you wish to do so.

Participants then filled out a short questionnaire that included the manipulation check (see materials and apparatus section below) before moving on the five minute computer-driven preparation phase of the experiment. Participants began the five minute period by pressing a key. They then saw a menu screen on which two options were presented. They had

the opportunity to practice anagrams or they could read about the sensations experienced during a finger pressure trial. If a participant chose to practice anagrams, he/she was presented with an anagram randomly selected from the computer data base. Next, the participant was given the option of seeing the answer or returning to the menu screen. If a participant chose to see the answer, he/she was shown the answer and given the opportunity to see another anagram or to go to the main menu.

If a participant chose to read about the sensations experienced during a finger pressure trial, he/she was exposed to the first of 23 statements. This statement reiterated that learning about the sensations experienced during the finger pressure trial aids people in coping with discomfort encountered during the trial. It was also emphasized that participants should close their eyes and visualize every statement they would read. For the first and all subsequent statements, participants were given the option of going on to the next statement or returning to the main menu. The remainder of the 23 statements involved the sensations that one would experience during a finger pressure trial (e.g., "The sensation of weight and stinging will become more and more pronounced as the trial goes on.") The twenty-three statements were on an endless loop such that if a participant indicated he/she wished to move beyond the twenty-third statement, he/she was then presented the first one. If a participant chose to return to the main menu and subsequently returned to the statements, he/she resumed reading statements where he/she had left off. The computer program tracked participants' movements among the three parts of the program (i.e., main menu, anagrams, and finger pressure statements). After five minutes, the computer displayed a screen which instructed participants to fetch the experimenter. Participants were subsequently probed for suspicion, debriefed, remunerated and excused by the first experimenter.

Materials and Apparatus

Questionnaire. Participants filled out a questionnaire prior to the preparation period. Two questions concerned the manipulation. Participants were asked to express the odds of their being assigned to the anagrams task and the odds of their being assigned to the finger pressure task. They also answered a subjective probability question about each task. The question read:

Now that you have stated the “objective” probability that you will be involved in either procedure, we would like you to answer a “subjective” probability question. Sometimes, even though we know that a certain event has a certain probability of occurring, it “feels” as though it is more or less likely to occur. Using the scale, below, circle the number that most closely corresponds to your impression of the probability that you will be engaging in the finger pressure task (anagrams task).

Participants then indicated, on eight-point scales (1 to 8) with end points labeled Will Definitely Not Happen and Will Definitely Happen, their subjective probability estimates for both tasks. Note that the metric of the scale allowed participants to re-indicate the objective odds. Participants then expressed their task preference on a nine-point scale (1 to 9), with the end points labeled Finger Pressure Task, and Anagrams Task, and the mid-point labeled No Preference.

Computer. A computer (a 386SX IBM-clone) with a program written in MEL (Microexperimental Laboratory) was used to record how participants allocated their preparation time (i.e., reading about the finger pressure sensations and practicing anagrams).

Results and Discussion

Of the 93 original participants, seven did not correctly answer the manipulation check questions concerning the odds of their being assigned to either task.⁷ Those participants were excluded from the present analyses. Thirty-seven men and 49 women remained. Sex of participant did not interact with any of the effects reported below.

Subjective Probability

A Self-Esteem X Probability Condition ANOVA was conducted on the subjective probability questions that were answered prior to the preparation period. For each measure, only the expected main effect of probability condition was obtained (F 's > 175 , $p < .001$; other F 's < 1).

Task Preference

I submitted participants' task preference ratings to a Self-Esteem (low vs. high) X Probability Condition (low odds for finger pressure vs. high odds for finger pressure) ANOVA. None of the effects was significant (F 's < 1). Also, participants' mean preference rating ($M = 5.94$) was significantly different from the neutral midpoint of the scale (No Preference = 5), $t(85) = 4.34$, $p < .001$. As expected, participants had a slight but consistent preference for the anagrams task.

Preparatory Behavior

I next analyzed participants' preparation behavior. Inspection of the preparation time distribution revealed some amount of skewness. Thus, preparation time scores were logarithmically transformed for analysis. Inspection of the raw means (reported in Table 6) suggests that participants in the low probability condition prepared less than those in the high probability condition. It would also appear that, compared to LSE participants, HSE people's

⁷Three LSE people in the low probability condition and two LSE participants in the high probability condition did not understand the odds. One HSE person in the low probability condition and one HSE participant in the high probability condition did not understand the odds.

preparation behavior was more affected by probability condition. A Self-Esteem X Probability Condition ANOVA on preparation time revealed a significant effect for probability condition, $F(1, 82) = 9.39, p < .01$. Participants in the low probability condition spent less time preparing for the finger pressure task ($M = 63.60$ seconds) than those in the high probability condition ($M = 87.41$ seconds).

The analysis also revealed the hypothesized Self-Esteem X Probability Condition interaction, $F(1, 82) = 4.11, p < .05$. HSE people dedicated more preparation time to reading about the finger pressure task in the high probability, compared to the low probability, condition, $t(82) = 3.63, p < .001$. Also as hypothesized, LSE people's preparation behavior was less tied to the probability of the painful event—nonsignificantly so in this study, $t(82) = 0.77, ns$. I next tested the related hypothesis that LSE participants in the low probability condition prepared more than HSE participants in that condition. This effect was in the predicted direction and significant, $t(82) = 1.90, p < .05$ (one tailed). There was no effect of self-regard in the high probability condition, $t(82) = 1.10, p > .20$. Note that there were no ceiling effects in this paradigm. Participants had 300 seconds at their disposal.

Table 6

Mean Preparation Time (in seconds) For the Finger Pressure Task as a Function of Probability Condition and Level of Self-Esteem

Probability of Finger Pressure Task	Level of Self-Esteem	
	Low	High
1 in 4	72.61 (36.02)	54.96 (49.40)
3 in 4	81.05 (35.29)	94.83 (33.20)

Note. For the LSE group: $n = 23$ for 1/4 odds, and $n = 21$ for 3/4 odds. For the HSE group: $n = 24$ for 1/4 odds, and $n = 18$ for 3/4 odds. Standard deviations in parentheses.

Summary

My hypotheses were substantiated. In general, participants in the high probability condition prepared more than those in the low probability condition. Compared to HSE people, the preparatory behavior of LSE people was less affected by the probability of an aversive event. People with high self-esteem adjusted their preparation behavior in accordance with stated probabilities—they prepared for an aversive event significantly less if it was improbable. Also as hypothesized, LSE individuals prepared more than HSE people when an aversive event was relatively unlikely. Replicating the coping results of Study 2, there was no effect of self-esteem on anticipatory coping in the high probability condition. The direction of the means was opposite to that of what I expected. If anything, HSE people prepared more for the aversive event than did LSE participants.

General Discussion

My hypotheses were largely confirmed. People who differed in their self-regard differed also in their future orientation and their tendency to prepare for an aversive future event. In Study 1, LSE people more quickly anticipated negative future events than HSE individuals, and the reverse held for positive future events. These findings are unique because earlier studies either involved a particular kind of event (e.g., McFarlin & Blascovich, 1981) or did not exclusively focus on thoughts about the future (e.g., Scheier & Carver, 1985). The results of the second study buttressed the findings of the first. LSE participants wrote more negative detail about a distasteful future occurrence than did HSE people. Also, there were no self-esteem effects in the speed with which past positive and negative episodes were recalled. Such effects, had they been obtained (i.e., LSE people faster in remembering negative episodes and slower in recalling positive episodes), would have been understandable, especially given the self-esteem differences in romantic and academic personal history found in Study 2. Thus, the question of self-esteem differences in the recall of the personal past remains unresolved in the current investigation and is worthy of further inquiry. Additional measures taken in Study 2 further delineated differences in LSE and HSE people's future orientation. LSE people judged they were more likely to break up with a romantic partner or fail academically than did HSE individuals. This self-esteem difference reversed for positive events.

The frequency of thought and likelihood judgments of Study 2 resembled highly the response latency effects obtained in Study 1. HSE people more quickly thought of positive than negative events, judged future positive events to be more likely than negative events, and indicated they thought of future good times more than bad. In contrast, LSE people evidenced no significant difference for positive and negative future events on all three measures. It would appear that LSE individuals are pessimistic only in comparison to HSE

people. Considered alone, they are best characterized as even-handed. They just as readily (and perhaps frequently) anticipate negative occurrences as they do positive and, arguably due to this equal ease of thinking, judge both types of events as equally likely (Tversky & Kahneman, 1974).

The method of Study 2 afforded control over possible self-esteem differences in event content. Importantly, the results of the second study were somewhat weaker than those of the first. In Study 2, HSE people did not write more positive details for positive events than LSE people. Perhaps the significant self-esteem effect for positive events in Study 1 was a reflection of more than LSE and HSE participants' readiness to anticipate positive events. HSE people might have thought of agreeable future developments that were inherently easier to generate. For example, the events may have been more concrete (e.g., getting married) than those contemplated by LSE participants (e.g., an image that meaning in life would one day be found). Importantly, my anticipatory coping hypotheses rest on obtaining self-esteem differences in the readiness with which negative events are anticipated. In both studies, LSE people thought of negative future events more quickly and in greater detail than did HSE individuals. Thus, the findings of Studies 1-2 confirmed the more central aspect of my theorizing.

In Studies 1-2, participants were instructed to think of positive and negative future events. Because much thinking about the future does not result from such explicit direction, my findings do not necessarily characterize the day to day cognitions of LSE and HSE people. People's thoughts, though, are often determined by aspects of situations. We have all found ourselves conjuring an image of a future event because a conversation partner has made reference to it. Thus, Studies 1-2 at least partly characterized the nature of self-esteem differences in daily thinking. Also due to the nature of the experimental instructions, I was unable to learn much about the regularity with which LSE and HSE people think of positive

and negative events in their personal future. Though responses to the frequency of thoughts questions in Study 2 largely reflected the response latency findings of Study 1, a definite conclusion must remain lacking. There were no significant self-esteem differences on this measure and its validity is questionable (Bassili, 1996; Ross, 1989).

My hypothesis regarding self-esteem differences in anticipatory coping was not confirmed in Study 2. Even though, compared to HSE respondents, LSE participants more readily thought of future negative events and judged the likelihood of such events to be higher, there was no apparent difference between LSE and HSE individuals' anticipatory coping. This lack of effect may be attributable to the fact that participants in Study 2 were asked to imagine that a negative event was certain to occur. Perhaps HSE people muster coping resources when they find it necessary to do so. Because Study 2 involved only events that were certain to occur, it was not possible to determine how HSE and LSE people differ in anticipatory coping when a future aversive event involving personal failure is understood to be relatively improbable. It could be that LSE individuals engage in more preparatory coping than HSE people. Indeed, I contend that the cautious nature of people with low self-regard would lead them to do just that. It remains to be seen, though, whether such differences would be found.

Importantly, I obtained evidence for my caution hypothesis in Study 3. As expected, LSE participants' anticipatory coping was less tied to the probability of the aversive event than HSE participants' preparatory behavior. Moreover, this pattern of responding entailed that HSE people prepared less for the finger pressure task than LSE participants when the odds were relatively low. I also conceptually replicated the noneffect of self-esteem for anticipatory coping that was obtained in Study 2. When participants in Study 3 understood that they, probably, would be assigned to the finger pressure task, there were no self-esteem differences in preparatory behavior. I note that the means were the reverse of what I originally

hypothesized. If anything, HSE participants engaged in more preparation than LSE individuals in the high probability condition. The same pattern held for elicited coping statements in Study 2. Though neither of these differences were significant, their direction could be meaningful. Perhaps HSE individuals, when they realize that an aversive event is inevitable, are better able than LSE individuals to muster coping resources. Because there were no significant self-esteem differences in either study, though, I must withhold further speculation.

Two other results of Study 3 bear consideration. First, it appears that there were no self-esteem differences in participants' subjective impression that they would be assigned to the finger pressure task. Thus, the difference between LSE and HSE people's anticipatory coping in the low probability condition cannot be attributed to differences in the impression that they would be assigned to the finger pressure task. LSE individuals are not superstitiously apprehensive, but cautious. Second, there were no self-esteem differences in preference for the finger pressure task. These results suggest LSE individuals greater preparatory behavior in the low probability condition was not a result of a primary appraisal process in which a relatively great threat was assessed (Lazarus & Folkman, 1984). Rather, it would appear that LSE individuals simply wished to protect themselves from the threat more than did HSE people.

I propose that the pattern of preparatory behavior obtained in Study 3 is typical of self-esteem differences in anticipatory coping. If my characterization of HSE and LSE people is correct, then the differences between the two groups should hold under a host of conditions. I hypothesize that two factors, probability and event negativity, will determine the amount of preparation by HSE and LSE people. As the probability of an aversive event becomes lower and lower, even cautious LSE individuals should engage in progressively less preparation behavior and come to resemble people with high self-regard. Thus, I would predict no self-

esteem differences in the tendency to brace for impact during the routine landing of a commercial passenger jet. I also hypothesize that the preparatory behavior of HSE and LSE people would resemble each other more if the consequences of the finger pressure task were more severe. The finger pressure task in the third study was rated as only moderately severe. Notwithstanding attrition effects, if the finger pressure task in Study 3 had been characterized as “extremely painful, some people faint,” HSE people might have dedicated a similar amount of preparation time as LSE individuals. A study in which the severity of the upcoming stressor is systematically varied (i.e., moderately vs. extremely severe) could prove informative in this regard.

I found self-esteem differences in anticipatory coping in a particular context. In the third study, participants were presented the option of preparing either for the reward task or the pain coping task. Thus, they engaged in one type of preparation to the exclusion of the other. This element of the procedure could be an important limiting condition of my findings. Perhaps LSE and HSE individuals would have behaved differently if they were presented with the choice of either preparing for the pain coping task or doing nothing in particular (e.g., reading a magazine). Indeed, the difference between LSE and HSE individuals’ preparation behavior in the low probability condition may have been smaller. Specifically, HSE people might have opted to prepare more for the finger pressure task in such circumstances. Because they would have lacked an attractive alternative, increased preparatory behavior would have been sensible. The context portrayed in the third study, though, is a common one. We all face dilemmas in which we must choose between exercising caution (e.g., studying an extra two hours for an upcoming exam) and engaging in rewarding behavior (e.g., going out with friends). Thus, the method used in Study 3 would appear to shed light on self-esteem differences in anticipatory coping in many everyday settings.

In the studies conducted here, I identified dimensions along which HSE and LSE people differ and then predicted additional differences. I cannot, though, claim a direct link between participants' standing on the dimensions of optimism and caution and the measures of interest. More direct evidence for my hypotheses could be obtained by administering questionnaires that measure LSE and HSE people's pessimism and cautious nature. The unique relation between those individual difference variables and the readiness to anticipate and prepare and aversive future events could then be determined.

All participants in the current studies were university students. Perhaps differences between those participants and the general population (e.g., age and socioeconomic status) have implications for the results obtained here. In their study of people's optimistic orientation toward the future, Newby-Clark and Ross (1999) noted that though the absolute levels of their obtained effects might differ according to socioeconomic status, it is not clear why the relative differences between thinking about future negative and positive events would not occur in other samples. Similarly, if I am correct that the effects I obtained here are a reflection of self-esteem differences in future orientation and caution, it is not clear why other populations would not show similar effects. To be sure, a person living in poverty might have a lower absolute level of optimism about the future and a more cautious orientation than someone living in suburbia, but there is little reason to believe that self-esteem, optimism and caution would not have the same interrelations. In addition, there is currently no evidence that university students have higher or lower self-esteem scores than those in the general population. Indeed, some researchers have found no differences (e.g., Larrick, Spencer, Josephs, & Von Hippel, 1990). Therefore, a consideration of population differences in self-esteem might be moot.

I have no evidence for the relation between self-esteem differences in anticipatory and subsequent coping. It should be noted, though, that other researchers have established a link

between low self-regard and superior functioning. McFarlin, Baumeister, and Blascovich (1984) found that people with high self-esteem engaged in nonproductive task persistence after failure, and such perseverance occurred even if HSE participants were told that continued effort would be futile. Compared to HSE people, LSE participants in the Knight studies exhibited a cautious style of solution-search that resulted in better performance on tasks that required such prudence (Knight & Nadel, 1986; Weiss & Knight, 1980). Also, a direct benefit of pessimism has been demonstrated. Some people are doubtful of their ability to achieve academically despite the fact that they have been successful in the past (Norem & Cantor, 1986). In fact, if their pessimism is contradicted by an experimenter who tells them that they will easily succeed on an upcoming test, they perform worse than if they are left to themselves to worry.

One's personal style will lead to advantage in some situations and not others. If, for example, the task characteristics used by Knight and colleagues had not been served best by prudence, LSE individuals may not have performed as well. This logic of person by situation interaction probably holds for anticipatory coping as well. If, for example, the conditions portrayed to participants in the third study were real, then the probability-sensitive preparation behavior of HSE participants would have been sensible. There are many situations, though, in which a lack of anticipatory coping for a relatively improbable event could leave HSE people at a distinct disadvantage. In future work, I will test whether there is indeed an Achilles' heel of high self-esteem.

In conclusion, the current studies demonstrate that people who differ in self-esteem think about and prepare for aversive future events in rather different ways. My analysis suggests that LSE people might find themselves at an advantage in certain situations. A little rain must fall into all of our lives. On a sunny day that unexpectedly turns cloudy, people with low self-esteem are likely to have an umbrella on hand.

Appendix A

Finger Pressure Task (Study 3)

Individuals are better able to cope with a non-protracted experience of pain (e.g., an endoscopic examination) if they are first familiarized with the sensations they will be experiencing (J. Johnson, 1973; J. Johnson, & Leventhal, 1974; Leventhal, Brown, Schacham, & Engquist, 1979). Thus, there could be a relation between the amount of time participants read the sensation information and their coping ability. To ascertain this relation, if any, all participants were assigned to the finger pressure task by means of a minor deception. Their pain reports, elicited at regular intervals during the finger pressure trial, served as an indicator of coping success.

Method

Procedure

“Random” assignment to task. After participants completed the preparation phase of the experiment, they were “randomly” assigned to the finger pressure task by means of a rigged ballot box (see materials and apparatus section below) and then informed that they had the option of being walked through the finger pressure protocol instead of taking part in the 90 second trial. Regardless of whether a participant agreed or disagreed to participate in the finger pressure trial, the experimenter then indicated that she was stepping out for a moment to fetch a second experimenter who would handle the finger pressure portion of the study. Before leaving the room, the experimenter asked participants to fill out a coping intention questionnaire (see materials and apparatus section).

Finger pressure task protocol. The second experimenter directed the participant to a seat at a table upon which was the finger pressure apparatus. The experimenter sat opposite the participant, with the apparatus between them, and said the following:

This is the finger pressure task. You will feel some discomfort and you should cope with it as best you can. The trial will end either when you say stop or after 90 seconds have passed, whichever comes first. So remember, if you want to stop, say “stop.” You will report your level of discomfort at regular intervals: at 10 seconds and then every 15 seconds after that. So, there will be a total of six reports. Every time I say “now,” you should report your level of discomfort using this scale.

The second experimenter then demonstrated the working of the finger pressure apparatus. Next, the experimenter addressed any questions the participant might have had. The experimenter wiped the finger pad and pressure bar with an alcohol swab and then assisted the participant in positioning the index finger of his/her non-dominant hand in the apparatus. Once the pressure bar was released, the trial began. Participants pain reports were taken at the first 10 seconds and every subsequent 15 seconds. The first experimenter wrote down the pain reports and also noted the verbal and non-verbal behavior of the participants. After the 90 second trial had ended (or the participant said “stop” before the end of the trial), the participants were released from the apparatus and told that the small dent on their finger, that resulted from the pressure of the bar, would disappear within the hour. The second experimenter then left.

Materials and Apparatus

Rigged ballot box. To create the appearance of a random draw, while ensuring that all participants were assigned to the finger pressure trial, a rigged ballot box was constructed. A slot was cut into the top of a cardboard box, into which the slips of paper shown to participants were dropped. Inside the box, below the slot, was a smaller box fashioned out of construction paper which caught the slips of paper shown to participants. In the bottom of the box were four slips of paper, all of which read “finger pressure task.”

Questionnaires. A coping intention questionnaire was administered subsequent to the preparation phase of the experiment. Participants were asked three yes/no questions regarding whether: (a) reading about the sensations experienced during the finger pressure trial would be helpful to most people, (b) reading about the sensations experienced during the finger pressure trial would be helpful to them, and (c) whether they intended to use the information about the sensations to cope with the pain. After the finger pressure trial, participants were asked whether they had used information about the sensations to cope during the finger pressure trial.

Strain gauge device. A modified Forgione and Barber (1971) strain gauge stimulator was used for the pain stimulus. The apparatus consisted of a finger pad that could be raised or lowered by the experimenter. Above the finger pad was a weighted pressure bar that could be raised or lowered (on to a finger resting on the pad; see Figure 2).

Pain reporting scale. The pain reporting scale was adopted from Ellermeir, Westphal, and Heidenfelder (1991). As recommended by them, the scale used category partitioning such that participants first decided upon a pain category (ranging from Very Slight Pain to Very Severe Pain) and then a number within the pain category—with higher numbers meaning higher levels of pain.

Results

Coping Intentions

Usefulness of sensation information. The majority of participants indicated they thought the sensation information would be useful (74% for the question about others and 63% for the question about self). By hierarchical loglinear analysis, these percentages did not vary by self-esteem, probability condition, or the interaction of the two (all χ^2 's < 1.55, all p 's > .10).

Intention to use sensation information. A slight majority of participants (58%) intended to use the information they had obtained. Though no effects of self-esteem or probability condition were significant, an unsurprising interaction between self-esteem and probability condition was marginal, $z = 1.81$, $p < .10$. Presumably reflecting their comparative lack of preparation, relatively few HSE people in the low probability condition (38%) indicated they would use the sensation information during the finger pressure trial.

Coping with Pain

Of the 86 participants, four opted to be walked through finger pressure procedure in lieu of participating in the finger pressure trial.

Finger pressure task attrition. Of the 82 remaining participants, four participants dropped out before the end of the finger pressure trial (one before 85 seconds elapsed, two before 70 seconds elapsed, and one before 40 seconds elapsed). In addition, a procedural error on the part of the second experimenter resulted in the third pain report of one participant, who completed the 90 second trial, not being recorded.

The experience of pain over time. This analysis included data only for those participants who provided pain reports all six times. A criterion-scaled regression analysis (Pedhazur, 1982), in which polynomial contrasts were fitted, was conducted. The highest order polynomial with significant fit was the quadratic contrast, $F(1, 382) = 155.9$, $p < .001$ [$F(1, 382) = 2338$, $p < .001$, for the linear contrast]. As can be seen in Figure 3, participants' initial pain reports were low and the intensity increased quickly at first. At later points, increases in pain were less dramatic.

This trajectory of pain reporting over time was not qualified by probability condition, self-esteem, or the combination of the two (F 's < 1). The relation between preparation time (i.e., time spent reading about the finger pressure trial) and the experience of pain over time

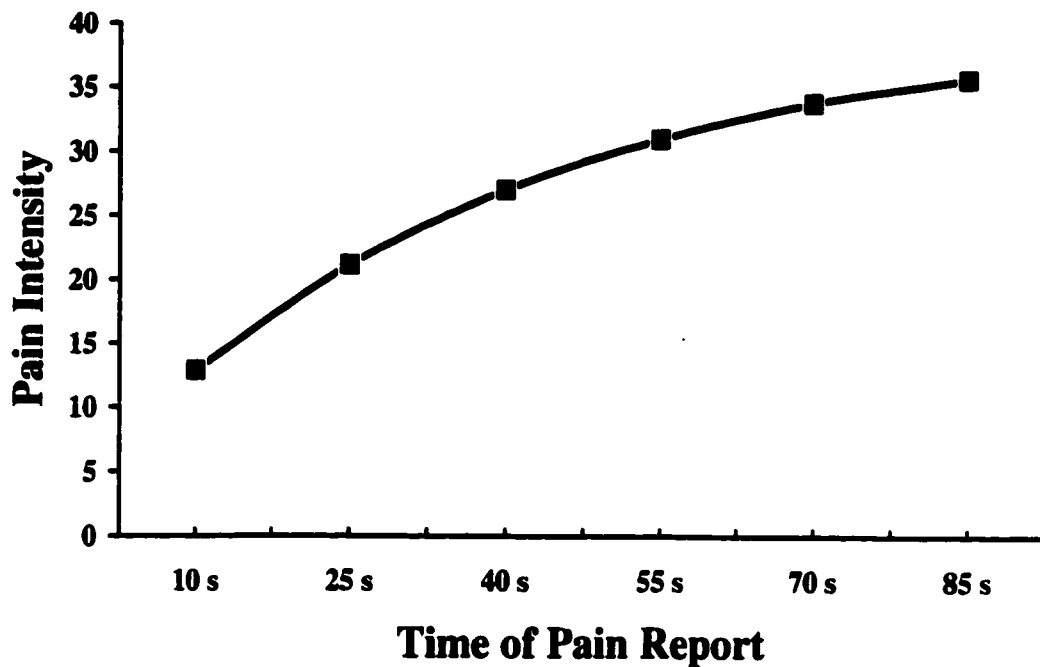


Figure 3. Pain intensity as a function of time of pain report (in seconds).

was also investigated. There was no effect for preparation, neither overall nor as a function of probability condition and self-esteem (F 's < 1.5, p 's > .20).

Minimum, maximum, and mean pain. Analyses involving the minimum, maximum, and mean intensity of pain experienced by each participant were conducted. There were no effects of probability condition, self-esteem, or the interaction of the two on the minimum ($M = 13.51$), maximum ($M = 36.24$), or mean intensity of pain ($M = 27.31$) experienced by participants (all F 's < 1). There were no significant correlations between preparation time and the three pain variables ($|r|$'s < .11, p 's > .30). There were no significant correlations as a function of probability condition, self-esteem, or the combination of the two with the exception of an unexpected positive correlation between preparation time and mean pain in the high probability condition, $r(37) = .33$, $p < .05$. This correlation suggests that the more preparation participants engaged in, the more pain they experienced.

Reported Strategy Use

Forty-three percent of participants indicated they had used the sensation information during the finger pressure trial. There was a marginal effect for probability condition that most probably reflected the main effect of condition on the preparation time measure. Compared to those in the low probability condition, relatively more participants in the high probability condition indicated they had used the sensation information (45% vs. 56%) $z = 1.92, p < .10$. On all measures of the experience of pain, use of information had no moderating effect—neither overall, nor in combination with probability condition and self-esteem (all F 's < 3.00 , all p 's $> .05$). In addition, the noncorrelation between preparation time and pain was not moderated by use of information ($|r$'s $< .10$, p 's $> .65$ and comparison z 's < 1.00 , p 's $> .40$).

Discussion

Given that there is an apparent robust relation between familiarity with painful sensation and subsequent coping (e.g. Leventhal et al., 1979), the lack of effect in the current study was unexpected. Of the myriad explanations for this null result, two bear some consideration. First, perhaps the painful procedure employed was not painful enough. In previous studies in which the familiarity with sensations hypothesis was tested, the painful stimuli were more intense and probably more alarming. Those studies involved the inducing of ischemic pain in the arm, via the temporary elimination of blood by a pressure cuff, for a minimum of five minutes (J. Johnson, 1973); cold-pressor pain for a period of six minutes (Leventhal et al. 1979); and an endoscopic examination. This last procedure included anesthetic via injection, a tube passed through the throat and stomach, and gagging (J. Johnson & Leventhal, 1974). Perhaps, then, participants in the current study were at “floor” for the experience of pain.

Two pieces of evidence speak against this interpretation. First, an inspection of Figure 3 suggests that participants were not at floor during the finger pressure trial. The mean maximum pain report was in the Severe Pain category of the scale. Also, the trial duration of 90 seconds was used precisely because other researchers have obtained effects within this time frame. Eastwood, Gaskovski, and Bowers (1998) found effects of hypnotic ability and analgesia instructions using the strain gauge stimulator and a 90 second trial.

Another explanation for the lack of effect stems from an important difference between the current study and the others on which it is based. In the ischemic pain, cold-pressor, and endoscopy studies, participants were not told about the usefulness of sensation information. Rather researchers tested the proposition that exposure to such information, compared to no exposure, would result in less pain. In the current study, it was necessary to tell participants that reading sensation information would aid in coping with the finger pressure task. Otherwise, it would not have been possible to study differences in use of that information. So informing participants, though, might have worked against any effect of preparation on subsequent coping.

The communication of sensation information is thought to be effective because it leads to expectancy confirmation on the part of the experiencer (J. Johnson, 1973). The attention of participants in the current study may have been divided between the monitoring of strategy effectiveness and confirmation of expectations. Such a conflict in allocation of attentional resources might have led to reduced effectiveness of the expectation confirmation process.

Alternatively, because participants were told that exposure to the preparation information would result in less pain, their expectancy for reduced pain might have mismatched the actual effectiveness of the strategy. If, for example, they expected maximal effectiveness of the strategy but still experienced some amount of pain, they might have

reported high levels of pain. There is one piece of evidence consistent with this interpretation: The only significant correlation between preparation behavior and pain reporting was opposite to the expected direction. People in the high probability condition who prepared more, and who arguably expected a large amount of relief, experienced more pain.

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