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# Affective Forecasting in Depression: The Effects of Ruminations versus Reappraisal

Catherine M. D'Avanzato

*University of Miami*, [cdavanzato@psy.miami.edu](mailto:cdavanzato@psy.miami.edu)

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UNIVERSITY OF MIAMI

AFFECTIVE FORECASTING IN DEPRESSION:  
THE EFFECTS OF RUMINATION VERSUS REAPPRAISAL

By

Catherine M. D'Avanzato

A THESIS

Submitted to the Faculty  
of the University of Miami  
in partial fulfillment of the requirements for  
the degree of Master of Science

Coral Gables, Florida

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AFFECTIVE FORECASTING IN DEPRESSION:  
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Catherine M. D'Avanzato

Approved:

---

Jutta Joormann, Ph.D.  
Associate Professor of Psychology

---

Terri A. Scandura, Ph.D.  
Dean of the Graduate School

---

Raymond L. Ownby, M.D., Ph.D., M.B.A.  
Professor & Chair, Department of  
Psychiatry and Behavioral Medicine  
Nova Southeastern University,  
Fort Lauderdale, Florida

---

Debra Lieberman, Ph.D.  
Assistant Professor of Psychology

**D'AVANZATO, CATHERINE**  
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There is much evidence that people are inaccurate in predicting the impact of future situations on their emotions. At the same time, affective forecasts have important implications for behavior, decision-making, and current mood, and may play an important role in the maintenance of emotional disorders. This study investigated two factors that influence affective forecasting: (1) whether affective forecasting is associated with depressive symptoms and (2) whether strategies people use to regulate their current affect influence their predictions of future emotional responses. Participants ruminated or reappraised in response to a sad mood and completed a measure of depressive symptoms (BDI). Results indicated that severity of depression symptoms was related to forecasts of greater sadness and anger to positive scenarios, as well as negative appraisals for future negative events. As expected, both BDI score and habitual use of emotion regulation strategies were correlated with participants' predictions about use and effectiveness of emotion regulation strategies in response to future scenarios. Results reinforced the usefulness of examining future-oriented cognitive processes in depression, providing insights into the role of hopelessness in the disorder. This study also shed light on the relationship between depression and predictions about the use and effectiveness of various emotion regulation strategies.

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## Chapter 1: Introduction

### *Background*

Major Depressive Disorder (MDD) is one of the most prevalent and disabling psychiatric disorders. Characterized by a period of extremely sad mood or loss of interest in pleasurable activities accompanied by a range of cognitive and somatic symptoms, including appetite and sleep disturbance, difficulty concentrating, feelings of worthlessness, and suicidality, depression is associated with great emotional suffering and impairment in daily functioning. It is estimated that between 16 and 17 percent of individuals will suffer from an episode of MDD at some point during their lifetime (Kessler et al., 2003). It is the fourth leading cause of disability throughout the world, ranking even higher than heart disease and stroke. Among all mental health disorders in the DSM-IV, it is the greatest cause of disability (Murray & Lopez, 1997). Depression is debilitating in part as a result of its highly recurrent course. Over half of those who suffer from depression will experience more than one episode throughout their lives, and each additional episode is associated with heightened risk for subsequent episodes (Keller & Boland, 1998). To relieve these substantial costs of depression to individuals and society at large, it is important to gain a deeper understanding of the factors that increase risk for developing depression and contribute to the maintenance and recurrence of the disorder.

### *Cognitive factors in depression*

Research focusing on cognitive factors has contributed significantly to our understanding of vulnerability to and course of depression. Cognitive theories hold that

people's thoughts, appraisals, interpretations, and assumptions greatly influence risk for and maintenance of depression (Joormann, 2008). According to Beck's (1987) cognitive model of depression, dysfunctional beliefs, in conjunction with stressful life experiences, lead to depression. Dysfunctional beliefs may remain latent for years until they are activated by a stressful life experience (Beck, 1987; Monroe et al., 2007). Once activated, they result in specific negative automatic thoughts, or pessimistic ideas, about the self, world, and future. In addition, activation of dysfunctional beliefs leads to several biases in the processing of emotional material, including over-attention to negative stimuli, interpretation of ambiguous information in a negative manner, and a memory bias for negative information relative to positive information (Mathews & MacLeod, 2005). Negative automatic thoughts and cognitive biases lead to increasingly depressed mood, which in turn leads to more negative automatic thoughts and biases. The result is a downward spiral of increasingly negative mood and thinking leading to the onset of a major depressive episode (Ingram, 1984).

Cognitive biases do not only play a role in the interpretation of current events in depression, but they may also influence the prediction of future events. According to the hopelessness theory of depression (Abramson et al., 1989), hopelessness, defined as a belief in one's inability to control the outcomes of stressful life events coupled with the belief that negative events are certain and positive events will not happen, is not merely a symptom of depression, but rather it plays an important role in the onset of depression (Abramson et al., 1989). In fact, hopelessness depression may represent a distinct subtype of depression (Abramson et al., 1989). Several factors are thought to contribute

to a sense of hopelessness, in particular the combination of negative life events and a characteristic attributional style, or tendency to explain these negative events as having stable, global, and internal causes (Abramson et al., 1989). Studies have supported the idea that pessimistic predictions can affect mood in important ways, contributing to the development of depression (Metalsky & Joiner, 1992). In addition, there is strong evidence that a pessimistic attributional style in conjunction with stressful life events can increase risk for depression (Hankin et al., 2001; Haeffel et al., 2005; Fresco et al., 2006; Alloy et al., 2006). In a recent study, hopelessness was even found to mediate the relationship between cognitive style and decreased goal-directed behavior (Haeffel et al., 2008).

#### *Depression and emotion regulation*

Despite some promising findings that suggest that cognitive biases constitute a vulnerability to developing depression, less is known about the causal mechanisms through which these variables are related (Joormann, 2008). It has recently been proposed that one way cognitive biases may play a role in depression is by hindering effective emotion regulation, or the ability to use cognitive and behavioral strategies to diminish negative mood and bolster positive mood (Joormann et al., in press). In fact, there is much evidence that depression is associated with difficulties in effectively using mood regulation strategies both to reconstruct negative events from the past and to cope with current adversity. First, depression has been associated with a greater tendency to use particular emotion regulation strategies, such as rumination and suppression, which have been shown to be less effective in repairing negative mood or even to backfire and

increase negative mood (John & Gross, 2004; Nolen-Hoeksema et al., 2008). Secondly, depressed individuals exhibit deficits in their ability to employ more effective strategies, such as the retrieval of positive memories, to repair negative mood (Joormann & Siemer, 2004).

One type of strategy for responding to negative mood that has been strongly and consistently linked to depressive symptoms is rumination. Rumination is defined as the process of repetitively focusing on one's emotional distress and its causes, without taking active steps to solve problems (Nolen-Hoeksema, 1991; Nolen-Hoeksema, 2008). There is evidence that attentional biases, particularly a deficit in the ability to disengage attention from negative irrelevant information, may underlie rumination (Joormann, 2004). The tendency to respond to stressful experiences with rumination has been shown to consistently predict recurrences of major depression. In some studies rumination has been tied to the duration of depressive episodes (Nolen-Hoeksema, 1991; Roberts et al., 1998). Numerous experimental studies manipulating participants' use of emotion regulation strategies have demonstrated that rumination leads to increases in dysphoric mood, negative thinking, and cognitive biases in both dysphoric and clinically depressed individuals (for a review, see Nolen-Hoeksema et al., 2008). Furthermore, rumination interferes with the ability of depressed individuals to generate solutions to problems and to effectively implement them (Lyubomirsky et al., 1999). Rumination may also lead to reduced motivation and sense of self-efficacy, which may in turn result in difficulties with problem-solving (Lyubomirsky & Nolen-Hoeksema, 1993). Tendency to ruminate has been associated with both a dependent interpersonal style and aggression (see review

by Nolen-Hoeksema et al., 2008). This may explain why chronic ruminators, despite being more likely to seek social support in the face of adversity, often report that they experience more interpersonal difficulties and receive less social support than those who are less likely to ruminate (Nolen-Hoeksema & Davis, 1999).

Another emotion regulation strategy that has been explored extensively in recent years is suppression, which involves attempting to control the expression of an emotion once it has been elicited (Gross, 1998). For example, in disagreeing with a romantic partner, a person may attempt to hide the negative emotion he or she is experiencing for fear of negative consequences of expressing it. Suppression is targeted primarily at modulating the behavioral aspects of an emotional response that has already been activated, which occurs late in the emotion generative process, as opposed to the experience of the emotion itself (Gross & Thompson, 2007). Many studies have demonstrated that suppression is ineffective in modulating negative emotion, and that it leads to a range of negative consequences (see review by John & Gross, 2004). For instance, in studies comparing the effects of different emotion regulation strategies on negative emotion following a film clip, suppression did not decrease the subjective experience of negative emotion (Gross, 1998; Gross & John, 2003). Those assigned to hide their emotional reactions to the film so that an observer could not see them actually experienced increased levels of physiological activation compared to controls, who were asked merely to watch the film. John and Gross (2004) argued that one explanation proposed for the increase in physiological arousal seen in individuals asked to suppress their reactions to the film is that suppression requires more effort and cognitive resources

to implement than other strategies, such as reappraisal. This hypothesis is also supported by recent studies comparing the effects of suppression with reappraisal on memory (Richards & Gross, 1999). Memory impairments for social information exchanged during a conversation, as well as for names and dates memorized from slides, have also been shown in individuals asked to suppress, but not in those asked to reappraise (Richards et al., 2003). There is much evidence that suppression is not only ineffective in reducing negative emotion in the moment, but also that individuals who have a greater tendency to use suppression over time have poorer mental health outcomes and impaired social functioning (John & Gross, 2004).

In contrast, reappraisal has been associated with more favorable outcomes (John & Gross, 2004). Reappraisal involves thinking about an event from a different perspective so as to modify its emotional impact. For example, a man who was fired from his job may focus on the fact that he will now have an opportunity to pursue a different career path he has long been interested in. Reappraisal, unlike suppression and rumination, has been shown to effectively alleviate negative mood without many of the destructive aspects of suppression and rumination (John & Gross, 2004). Because reappraisal occurs much earlier in the emotion generative process, before the emotion has been fully elicited, it is theorized to consume fewer cognitive resources than suppression. This is supported by research demonstrating reappraisal, unlike suppression, does not result in any increase in physiological activation (Gross, 1998). Similarly, those asked to reappraise in response to negative mood recalled significantly more facts from a conversation than did those asked to suppress (Richards et al., 2003). In another study,

those assigned to have a conversation with reappraisers showed significantly lower levels of physiological arousal than those assigned to interact with suppressors, indicating that it was more stressful for participants to interact with a suppressor than a reappraiser (Butler et al., 2003). These studies suggest that reappraisal may not carry many of the cognitive and social costs that suppression does.

Another strategy for responding to upsetting events that has been shown to have more positive consequences for emotional well-being is distraction. Distraction involves turning one's attention away from negative mood-related thoughts by focusing it on pleasant or neutral thoughts or behaviors. In studies examining the effects of distraction on negative mood, participants are typically asked to focus their attention on neutral images or thoughts (e.g. "Think about a fan slowly rotating back and forth") that are sufficiently engaging to draw attention away from themselves and their problems (Nolen-Hoeksema et al., 2008). Previous research has strongly supported that distraction relieves dysphoric mood both in dysphoric and depressed individuals (Donaldson & Lam, 2004; Joormann & Siemer, 2004; Lyubomirsky & Nolen-Hoeksema, 1993) in the short term. Lyubomirsky and colleagues (1999) found that, whereas rumination hampered effective problem-solving in dysphoric individuals by reducing their motivation and self-efficacy, no deficits in problem-solving were seen in dysphoric individuals induced to distract. Cross-sectional studies examining the relationship between trait distraction and depressive symptoms have produced mixed results (Donaldson & Lam, 2004), which may be due in part to the way in which distraction has been operationalized on the RSQ.

In addition to showing a tendency to use less effective types of strategies, depressed individuals may have more difficulty effectively implementing certain types of emotion regulation strategies when they do attempt them. For instance, Joormann and Siemer (2004) found that, whereas recalling positive autobiographical memories served to reduce negative mood in nondysphoric individuals, it had no effect on the negative mood of dysphorics. Interestingly, this was the case even though the number, valence, and specificity of dysphorics' memories did not differ from those of nondysphorics.

### *Affective Forecasting*

The majority of research to date on emotion regulation in depression has focused on how depressed individuals reconstruct events in the past or on how they use different strategies to regulate current emotions. Very few studies have investigated the relation between emotion regulation and future-oriented thinking. Research on affective forecasting, or the prediction of one's future emotional responses, has been conducted primarily within the field of social psychology. Although people are generally accurate at predicting the valence and specific type of emotions they would experience in a variety of situations in the future, they are less accurate in predicting the intensity and duration of their emotional responses (see review by Wilson & Gilbert, 2003). Affective forecasting has been the focus of much research within psychology because of the strong influence it has on decision making and behavior. More recently research has begun to explore how affective forecasts influence current emotion (Buehler et al., 2007).

*Impact Bias.* There is much evidence that people tend to overestimate the intensity and duration of their emotional responses to future events, an error in affective forecasting that has been referred to as the impact bias (Wilson & Gilbert, 2003). Many studies examining the accuracy of people's affective forecasts have used a between-subjects design in which one group of participants (forecasters) are asked to make predictions about their emotional responses to a future event, and another group (experiencers) experience that event and then provide ratings of their actual emotional responses to it (e.g. Wilson et al., 2005). Comparing the predictions of forecasters with the emotion ratings of experiencers, these studies have consistently found that forecasters anticipate events will have a significantly greater impact on their emotions than experiencers report (Wilson & Gilbert, 2003). This has been shown to be the case for a wide range of types of events, including both positive and negative events.

A number of sources of the impact bias have been documented. Many of these pertain to factors that influence people's actual emotional responses that occur outside of conscious awareness (e.g. Gilbert et al., 1998; Wilson et al., 2000). Focalism, or the failure to consider how other unrelated events will influence one's emotional responses and moderate the impact of the focal event, is one reason for the impact bias (Wilson et al., 2000). For instance, a person may overestimate how happy he or she will be at graduation, overlooking the stress of searching for a job and saying goodbye to friends that will also be taking place. Wilson and his colleagues (2000) investigated the effects of focalism on affective forecasting by asking college students to predict their emotional responses to their football team winning. One group of students was asked only to

predict their level of happiness after the game and each of the next three days. A second group was asked to write about all the activities they would be doing one day after the game before making their predictions about their level of happiness after the game. These two groups of forecasters' predictions were then compared with actual emotional ratings of a group of experiencers. As expected, the group asked to think about all of their daily activities showed significantly less of an impact bias than those asked only to forecast their reaction to the win. Prompting students to consider several of their daily activities during the days following the game prevented them from overemphasizing the impact of the football game on their happiness.

People also overestimate the emotional impact of events because they fail to consider the powerful psychological processes they will use to regulate their emotions, a mechanism known as immune neglect (Gilbert et al., 1998). Often these psychological processes occur instinctively, without people being aware that they are using them. Wilson and Gilbert (2005) argue that humans have a strong motivation to make sense of novel, unexpected events that are relevant to them, and that these sense-making processes temper their emotional reactions. For example, a man whose girlfriend unexpectedly ends the relationship may reason that it happened because she was not the right person for him after all.

People also overlook their motivation to make sense of positive events. In fact, sense-making processes may diminish the impact of pleasurable events. This was demonstrated in a study in which students were unexpectedly given a dollar coin attached to an index card, and the ease with which they could understand the reason for the gift

was manipulated by the text on the card (Wilson et al., 2005). Those in the difficult to understand condition were significantly happier five minutes after receiving the card than those who received the card with the message that was easy to understand. However, a separate group of forecasters predicted the opposite effect, expecting that they would be happier to receive the coin if the card made it easy to understand why they had received it than if it was unclear. Wilson and his colleagues replicated this effect in other studies (2005). They demonstrated that participants watching a happy movie who were unsure of the outcome reported being much happier than those who were told the outcome. Similarly, participants receiving positive social feedback who were not told who had given the feedback reported being happier than those who were given this information. In each of these cases, people incorrectly predicted they would be happier in the certain condition than the uncertain condition.

#### *Relation between Affective Forecasting and Emotion Regulation*

Affective forecasting has generated widespread interest among psychologists because of its many implications for decision-making, behavior, and emotion. People are strongly motivated by the desire to achieve happiness and avoid experiencing negative emotions, thus they base many important decisions on their forecasts of the emotions they may experience in hypothetical situations in the future (Wilson & Gilbert, 2003). If people cannot accurately predict their emotional responses, they should be less able to seek out experiences that will make them happy and avoid situations that will bring them distress. Biases in forecasts therefore may affect motivation, behavior, and current mood states. Thus, people seek situations that they expect will result in happiness (and avoid

those that they expect will result in negative emotions) and manipulate situations to make them more likely to result in happiness (or less likely to cause sadness) (Loewenstein, 2007).

Loewenstein (2007) recently proposed that people do not only make forecasts about their emotional states, but they also make forecasts about their use and about the effectiveness of emotion regulation strategies. In an exploratory study, Loewenstein (2007) investigated 78 college students' intuitions about the effectiveness of cognitive strategies, including suppression, distraction, and reappraisal, for regulating a range of negative emotions. Students were presented with emotional scenarios and asked for each scenario to predict their use of and the effectiveness of emotion regulation strategies. One group of students was asked to describe in words the mental strategy they would use. Another group was asked to choose among these strategies 1) the strategy that would be most effective for regulation in that scenario and 2) the strategy that would be least likely to backfire and upset them more in the scenario. Results provided some evidence that, in addition to miscalculating the qualities of their emotional reactions, people appear to be somewhat inaccurate in their intuitions about the effectiveness of different strategies for dealing with these emotions. For instance, in response to closed-ended questions, students predicted that they would be most likely to use suppression over the other strategies, and that suppression would be the most likely to be effective and the least likely to backfire. Students' preferences in this study were in contrast to the literature demonstrating that suppression is in fact less likely to be effective and more likely to backfire than the other strategies.

Some researchers have hypothesized that affective forecasts may themselves serve a mood regulatory function. Buehler and colleagues (2007) examined the effects of manipulating individuals' moods and orientation to their feelings (ruminative versus reflective) on the positivity of their affective forecasts. In this study a reflective orientation was characterized by openness to exploring negative feelings without fixating on them and, unlike a ruminative orientation, a perceived ability to regulate negative moods. Participants in a negative mood state who adopted a reflective orientation toward their mood actually generated more positive affective forecasts, presumably because they were motivated to try to repair their negative mood. In turn, the greater positivity of their predictions resulted in more positive emotions in response to their forecasts. As expected based on research showing that rumination prompts increased negative cognitions, those in the ruminative orientation did not show this effect.

### *Current Study*

The present study expanded on previous research on affective forecasting to explore how emotion regulation and affective forecasting are related and how depressed individuals differ in their predictions from non-depressed individuals. Despite previous research studies about affective forecasting errors and their implications for behavior, decision-making, and emotion, studies are needed that examine individual differences in affective forecasting. Given the profound effects that affective forecasting errors can have on motivation, behavior, and mood, individual differences in these forecasts may be associated with the anhedonia, loss of motivation and hopelessness observed in depression. Surprisingly, few studies have examined affective forecasting in individuals

with psychological disorder, such as depression. Research on differences in affective forecasting and in predictions about emotion regulation strategies between healthy individuals and those with depression could therefore contribute to our current understanding of depression. Thus, one aim of the current study was to examine the relation between depression and both affective forecasting and beliefs about the effectiveness of emotion regulation strategies.

In addition, this study examined whether differences in how people regulate current emotional states affect their affective forecasts. It is known that depressed people have a greater tendency to use maladaptive emotion regulation strategies. Little is known, however, about whether the use of these emotion regulation strategies affects affective forecasts and beliefs about the effectiveness of emotion regulation strategies. Thus, a second aim of this study was to examine whether the use of specific emotion regulation strategies is associated with changes in affective forecasts, and whether emotion regulation influences beliefs about the use of and the effectiveness of emotion regulation strategies in the future.

Participants were presented with positive and negative emotional scenarios modeled after those used by Loewenstein (2007) and asked to make predictions about their emotional responses if faced with the situations, including the specific type of emotion they would experience, and the intensity and duration of their reactions. They were also asked to make predictions about which types of emotion regulation strategies they would use in the situation, as well as about which strategies they thought would be most effective. For negative scenarios, they were asked about the use and effectiveness

of strategies to put themselves in a better mood, whereas for positive strategies they made predictions about how they would prolong the positive feeling. The first objective of the study was to examine whether depressive symptoms are related to predictions of the impact of emotional situations on emotional responses, as measured by ratings of predicted intensity and duration of their emotions. Similarly, dysphorics' expectations about the use and effectiveness of different emotion regulation strategies were compared to those of nondysphorics, as well as to research findings on the relative effectiveness of these strategies.

In addition, this study built on recent attempts to explore the effects of specific techniques for regulating negative mood on affective forecasts. After participants made predictions of their responses to the first seven scenarios, they completed a negative mood induction and an emotion regulation induction guiding them to either ruminate or reappraise in response to their sad mood. Finally, they made predictions about the seven remaining emotional scenarios. The purpose of the mood induction and emotion regulation induction was to determine the effects of these different strategies on 1) later forecasts of types, intensity, and duration of emotional responses to situations and 2) subsequent expectations about use and effectiveness of different types of emotion regulation strategies. Based on the literature showing that depressed individuals tend to be more likely to use maladaptive emotion regulation strategies, such as rumination, than healthy individuals, an objective of this study was to examine whether rumination and reappraisal in response to a negative mood state results in predictions of more negative

outcomes in response to emotional events. An additional objective was to determine whether these strategies influence people's beliefs about emotion regulation strategies.

### *Hypotheses*

The hypotheses for this proposed study were as follows:

I. *Affective forecasts*. Effects on affective forecasting were assessed by examining the mean ratings of predicted intensity and duration to both negative and positive events.

1. *Emotion regulation strategies affect affective forecasting*. Rumination, relative to reappraisal, was expected to result in predictions of greater intensity and duration of negative emotional responses for negative events, and predictions of less intense, briefer positive emotional responses for positive events. This was assessed by comparing affective forecasts to a) negative scenarios and b) positive scenarios from the first block of scenarios administered before the mood induction with those from the second block of scenarios administered after the mood induction and emotion regulation induction.

2. *Depressive symptoms are associated with affective forecasting*.

A. Depressive symptoms are associated with predictions of more intense, longer-lasting negative emotional responses to negative events. Furthermore, those with more severe depressive symptoms predict less intense, briefer positive emotional responses to positive scenarios.

B. Depressive symptoms interact with emotion regulation in affecting forecasts. It was expected that the effect of rumination versus reappraisal on

affective forecasts is more pronounced for those with more symptoms of depression. This was assessed by comparing affective forecasts pre versus post mood induction in relation to BDI scores.

II. *Appraisals*. To assess effects on appraisals, participants' ratings of a) how responsible they are for the event, b) how much they can still influence the outcome of the event, c) how expected the event is, d) how much the event will impact their self-perception, and e) how much the event will impact their lives were examined.

1. *Emotion regulation strategies affect appraisals of emotional events*. We expected that participants in the rumination group would predict that they are more responsible for negative scenarios occurring, less responsible for positive scenarios occurring, and that negative scenarios have a greater impact. In contrast, we expected that reappraisers should predict they are less responsible for negative events occurring, more responsible for positive events occurring, and that positive events will have a greater impact.

2. *Depression is associated with appraisals*. Consistent with previous studies, it was expected that dysphoric individuals would tend to make more negative appraisals of scenarios than non-dysphoric individuals. Those with more severe symptoms of depression were expected to predict they are more responsible for negative scenarios occurring, less responsible for positive events occurring, and that negative events will have a greater impact relative to those with fewer symptoms. In addition, we also

examined how depressive symptoms interact with induced emotion regulation strategies to influence appraisals.

III. *Expectancies about emotion regulation strategies.* Expectancies of emotion regulation strategies were assessed by a) participant's ratings of how likely they would be to use a given strategy, b) participant's ratings of how effective a given strategy is likely to be, and c) their responses to the multiple choice question after each scenario asking them to select from among several options the strategy they predict would be the most effective in improving their mood.

1. *Emotion regulation strategies affect beliefs about emotion regulation.*

Rumination relative to reappraisal was expected to cause participants to predict they would be more likely to use maladaptive strategies for coping with negative emotion, including suppression and rumination, and that these strategies would be more effective than more adaptive strategies, such as reappraisal and distraction. The effect of rumination versus reappraisal on preferences for emotion regulation processes was examined by comparing participants' expectancies of emotion regulation strategies for the first block of scenarios before the manipulation to those in the second block after the manipulation.

2. *Depression affects beliefs about emotion regulation strategies.* Participants with more severe symptoms of depression were expected to report a preference for more maladaptive emotion regulation strategies, such as rumination and suppression, for coping with negative events than those with fewer symptoms.

*IV. Additional exploratory analysis.* In addition, the relationship between other self report measures and affective forecasts, appraisals, and beliefs about emotion regulation strategies was examined. It was expected that trait anxiety, as well as the Big Five personality traits would be correlated with forecasts of intensity and duration of emotional response to scenarios. In addition, trait use of suppression, reappraisal, and rumination were expected to be correlated with participant's ratings of use and effectiveness of the different strategies.

Table 1.1

*Study Hypotheses*

		Independent Variables	
		Reappraisal vs. Rumination	Individual Differences
Dependent Variables	Affective Forecasts	<ul style="list-style-type: none"> <li>• Rumination → predict more intense, longer negative emotions to negative events compared to reappraisal</li> <li>• Rumination → predict less intense, briefer positive emotions to positive events</li> </ul>	<ul style="list-style-type: none"> <li>• &gt; Depressive symptoms associated with more intense, longer negative emotions to negative events</li> <li>• &gt; Depressive symptoms associated with less intense, briefer positive emotions to positive events</li> </ul>
	Appraisals	<ul style="list-style-type: none"> <li>• Rumination → more negative, pessimistic style of appraising negative and positive events compared to reappraisal</li> </ul>	<ul style="list-style-type: none"> <li>• &gt; Depressive symptoms associated with more negative, pessimistic appraisals of negative and positive events</li> </ul>
	Predictions about Emotion Regulation Strategies	<ul style="list-style-type: none"> <li>• Rumination → prefer more maladaptive strategies (e.g. rumination, suppression for coping with negative events)</li> </ul>	<ul style="list-style-type: none"> <li>• &gt; Depressive symptoms associated with preferences for more maladaptive strategies for coping with negative events</li> </ul>

## Chapter 2: Methods

### *Participants*

Participants were recruited from the University of Miami undergraduate research participant pool. Students recruited into the study were compensated with one credit per half hour of their participation in the study. 84 participants were recruited for the study: 43 were randomly assigned to receive the rumination manipulation, and 41 were randomly assigned to receive the reappraisal manipulation. The number of participants selected was based on the estimated power of .95 needed to observe the predicted effect of rumination versus reappraisal on affective forecasting and the average effect sizes used in a recent study on the effects of rumination versus reflection on negativity of affective forecasts ( $d = .68$ ) (Buehler et al., 2007). No exclusion criteria were applied.

### *Measures*

*Beck Depression Inventory (BDI-II; Beck & Steer, 1993; Beck, Steer, & Garbin, 1988)*. This 21-item questionnaire measures self-reported severity of symptoms of depression. Each item assesses the severity of a specific symptom, with ratings ranging from 0 to 3. Scores on individual items are then summed, with overall scores ranging from 0 to 63. Higher scores indicate greater severity of depressive symptomatology. The BDI is a widely used self-report measure of depression with high internal consistency, ranging from .73 to .92 with a mean of .86 (Beck, Steer, & Garbin, 1988). It has also been shown to be concordant with clinician ratings of depression, with correlations ranging from .62 to .66 (Foa, Riggs, Dancu, & Rothbaum, 1993).

*Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977).* This 20-item self-report measure assesses the presence and frequency of depressive symptoms. Each item is rated on a four-point likert scale ranging from 0 (rarely) to 3 (most of the time), and four of the items are reverse-scored. Overall scores range from 0 to 60, with higher scores indicating a greater number and frequency of symptoms of depression. Internal consistency ranges from .84 to .90.

*Emotion Regulation Questionnaire (ERQ; Gross & John, 2003).* This 14-item questionnaire measures individual differences in the experience of and in the expression of negative and positive emotion, specifically in the use of reappraisal and suppression. Each item is rated on a seven-point likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Internal consistency ranges from .75 to .82 for the reappraisal items and from .68 to .76 for the suppression items. Test-retest reliability for both reappraisal and suppression over a period of three months in a college sample was .70 (Gross & John, 2003).

*Mood Ratings.* Current mood was measured at several points throughout the study by asking participants to rate to what extent each of six emotions (Sad, Tense, Happy, Depressed, Anxious, Irritable) describes how they are currently feeling. Each item is rated on a nine-point scale, ranging from 1 (Not at all) to 9 (Extremely).

*NEO Five Factor Inventory (NEO FFI; McCrae & Costa, 1987).* Neuroticism, Extraversion, Openness, Conscientiousness, and Agreeableness, will be assessed using the 60-item NEO FFI, which is a truncated version of the NEO PI-R. Each item is rated

on a five-point scale ranging from Strongly Disagree to Strongly Agree. Numerous studies have demonstrated its reliability and validity.

*Response Styles Questionnaire (RSQ; Nolen-Hoeksema & Morrow, 1991).* This 25-item questionnaire measures the tendency to cope with negative mood by ruminating, or repeatedly thinking about one's symptoms or the possible causes and consequences of one's distress without taking steps to actively problem-solve. Each item is rated on a four-point likert scale ranging from 1 (almost never) to 4 (almost always). Scores range from 25 to 100, with higher scores indicating a greater general tendency to ruminate in response to distress. The RSQ has been shown to have moderate to high test-retest reliability (Nolen-Hoeksema et al., 1994), and its internal consistency is above .80 (Nolen-Hoeksema & Morrow, 1991). Furthermore, individual's responses to the RSQ have been demonstrated to correlate significantly with actual use of rumination in response to a depressed mood (Nolen-Hoeksema & Morrow, 1991).

*State-Trait Anxiety Inventory-Trait (STAI-T; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983).* This 20-item scale assesses stable individual differences in proneness to anxiety symptoms. Responses range from 1 (almost never) to 4 (almost always) with nine reverse-scored items. The STAI-T has well documented reliability and validity.

## Procedure

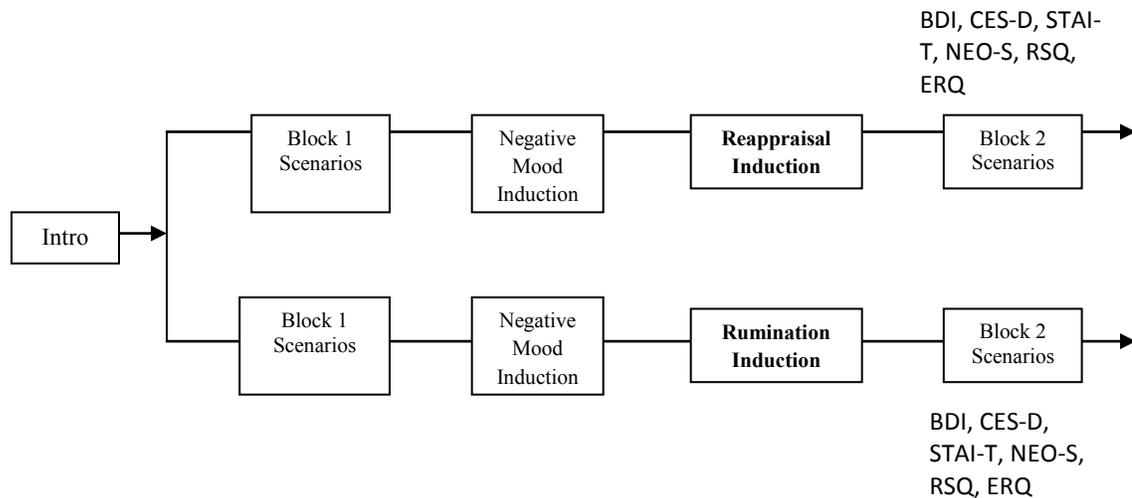


Figure 2.1. Study overview

*Block 1 Scenarios.* Participants were presented with two blocks of seven emotional scenarios describing typical life experiences modeled after those used in Loewenstein's (2007) study on forecasting of the use and effectiveness of different emotion regulation strategies (Appendix A). Ten of the fourteen scenarios pertained to negative emotions, while the remaining four pertained to happiness. Of the ten negative scenarios, six described situations that would typically elicit sadness, two pertained to anger, and two pertained to anxiety. The order in which scenarios were presented was counterbalanced, such that half of the participants received Group A in the first block and Group B in the second block, whereas half of the participants received Group B in the first block and Group A in the second block. The order scenarios were presented within each block was randomized, with the exception that the two positive scenarios in the second block were presented last. The purpose of presenting the positive scenarios in the

second block after the negative scenarios was to ensure that they did not interfere with the effects of the negative mood induction.

Scenarios were presented one at a time on the computer screen, and participants were asked to vividly imagine themselves in the situation and to consider how they would feel and react if the situation were to happen to them. Participants had as long they needed to read the scenarios. After each scenario, they were presented with a series of questions asking them to make predictions about their affective reactions, appraisals, and strategies for emotion regulation if faced with the situation (Appendix B). Questions pertaining to strategies for emotion regulation varied, depending on whether the valence of the scenario presented was positive or negative. In addition, participants were asked to rate their current mood at the end of each series of questions in order to control for any effects of current mood state on their predictions.

*Mood Induction.* After the first block of scenarios, a sad mood was induced in participants through an autobiographical mood induction procedure. The procedure was adapted from similar procedures used in the emotion regulation literature (Siemer, 2001; Siemer, 2005; Lerner & Gonzalez, 2005), which have been demonstrated to be highly effective. Participants were asked to recall a very sad event from the past and to write about the event in detail continuously for eight minutes. Specifically, they were asked to vividly describe the event and the feelings they experienced in enough detail that another person, who was not present during the event, would feel as sad as they felt in the situation merely by reading their description. During the task, participants also listened to a segment of classical music, the fourth movement of Mahler's Fifth Symphony, a

technique which has been used successfully to induce a sad mood in previous research (e.g. Tamir et al., 2002).

*Emotion Regulation Induction.* Following the mood induction, participants' response to their sad mood was manipulated. One group of participants was instructed to ruminate about the sad event they recalled during the mood induction, and a second group was instructed to reappraise the sad event. Participants were told that the purpose of the task was to examine factors influencing concentration. A total of eight cues were presented, one at a time, which guided participants to either ruminate about or reappraise the sad event they previously wrote about (Appendix C). Each cue prompted participants to focus their attention completely on a specific aspect of the sad event. After each cue, they were asked to rate their ability to concentrate during the entire time the cue was presented. Following the mood orientation manipulation, participants were once again asked to rate their current mood. Given that previous research has indicated that rumination and reappraisal influence negative mood in different ways, the aim was to control for any influence of mood changes resulting from the manipulation on subsequent predictions.

*Block 2 Scenarios.* Once the emotion regulation induction was completed, the second block of seven scenarios was presented. Once again, scenarios were presented one at a time. Following each scenario, a series of questions was presented assessing their predictions of their emotional reactions, appraisals, and emotion regulation strategies if faced with the scenario.

Finally, participants were asked to complete a battery of questionnaires assessing their current symptoms of depression, general tendency to experience anxiety, emotion regulation tendencies, proneness to rumination, and personality traits. The entire study lasted approximately two hours. At the end of the session, participants were thanked, given the opportunity to ask questions, and compensated for their participation in the study. Participants were also asked if they were aware of the hypotheses of the study or of the connection between the various tasks, which may have biased their responses.

### Statistical Analyses

1. *Mood Induction Check.* It was expected that the mood induction would result in a decrease in ratings of current sadness, but that the emotion regulation induction would have no effect on mood ratings. To test this hypothesis, a mixed-design ANOVA was conducted with condition (rumination/reappraisal) as the between-subjects factors and timepoint (pre/post mood induction/ post emotion regulation task) as the within subjects factor. A significant main effect of time was expected from pre to post mood induction. The interaction between timepoint and condition was not expected to be significant.

2. *Effects of induced emotion regulation on affective forecasts and appraisals.* The first set of hypotheses was that rumination would result in more negative affective forecasts and appraisals compared to reappraisal. A mixed-model ANOVA with response manipulation condition (rumination/reappraisal) as the between-subjects factor and both timepoint (pre versus post manipulation) and valence of scenarios (positive/negative) as within-subject factors was used. The dependent variables were a)

ratings of intensity and duration and b) appraisal ratings of responsibility for the event, controllability of the event, how expected the event is, and the impact of the event on one's life and self-perception.

3. *Effects of induced emotion regulation on expectancies of use and effectiveness of different emotion regulation strategies.* It was predicted that rumination compared to reappraisal would cause participants to expect they would be more likely to use maladaptive emotion regulation strategies, such as reappraisal and suppression, to cope with negative events. Similarly, rumination compared to reappraisal was expected to cause participants to rate maladaptive strategies as being more likely to be effective. A mixed-design ANOVA with emotion regulation induction condition as the between-subjects factor and timepoint as a within-subjects factor was used. The dependent variable was ratings made for each strategy of anticipated use of the strategy and effectiveness of the strategy for coping if faced with the scenario. Analyses were conducted separately on each type of emotion regulation strategy (suppression, rumination, distraction, and reappraisal). If reappraisal and rumination do affect beliefs about use and effectiveness of emotion regulation strategies, a significant interaction between timepoint and condition would be expected.

4. *Association among depressive symptoms and affective forecasts and appraisals.* In addition, it was expected that depressive symptoms would be associated with more negative affective forecasts and appraisals. To test this hypothesis, BDI score

was correlated with mean affective forecast ratings and appraisal ratings for the first block of scenarios.

It was expected that a greater change pre versus post manipulation would be seen in affective forecasts and appraisals of those with more depressive symptoms compared to those low on depressive symptoms. In order to test the interaction effect of individual differences and induced emotion regulation on affective forecasts and appraisals, regression analyses were conducted with BDI score and condition (rumination/reappraisal) as predictors and change scores in mean affective forecast and appraisal ratings as the dependent variables.

*5. Association between individual differences in depressive symptoms and expectancies of use and effectiveness of different emotion regulation strategies.*

Participants with more severe depressive symptoms were expected to be more likely to predict they would use maladaptive strategies for regulation emotion, such as rumination and suppression, and that these strategies would be more effective compared to those low on depressive symptomatology. To test this hypothesis, BDI score was correlated with ratings of expected use and effectiveness of each strategy for regulating negative emotion (rumination, reappraisal, suppression, distraction).

*6. Association among individual differences in self-report measures and expectancies about emotion regulation strategies.* In addition, it was anticipated that individual differences in trait use of rumination (indicated by RSQ score), and suppression and reappraisal (ERQ score), would be associated with predictions about use and effectiveness of emotion regulation strategies. Those high on trait use of rumination

should be more likely to prefer rumination to cope with negative events. Similarly, those higher on trait use of suppression and reappraisal were expected to report higher ratings of expected use and effectiveness of suppression and reappraisal, respectively. RSQ score and ERQ scores were expected to be correlated with ratings of expected use and effectiveness of each strategy for regulating negative emotion.

## Chapter 3: Results

### I. Demographic Characteristics and Mood Induction Check

*Demographic Characteristics.* Mean age of participants was 19.63 years old ( $SD=2.2$ ). Participants included 49 women and 35 men. Independent samples t-tests and  $\chi^2$  tests were used to examine differences in age and gender between the reappraisal and rumination conditions. No differences were found across conditions in age,  $t(84) = 1.11$ , *ns*, or gender,  $\chi^2(1, n=84) = 2.33$ , *ns*, of participants. In addition, independent samples t-tests were used to assess differences across conditions in depression severity (as measured by BDI total score) and self-reported general use of emotion regulation strategies (as measured by the ERQ- suppression and reappraisal subscale scores). There were no significant differences in depressive symptom severity,  $t(82) = .08$ , *ns*, or in the habitual use of suppression,  $t(84) = .46$ , *ns*, reappraisal,  $t(84) = 1.43$ , *ns*, or rumination,  $t(84) = .36$ , *ns*, between participants assigned to ruminate versus reappraise.

*Mood Induction Check.* All participants underwent a negative mood induction, followed by the emotion regulation task, in which half of the participants were assigned to reappraise and half of the participants were assigned to ruminate. We expected that all participants would show an increase in sadness ratings from pre to post mood induction. In addition, it was expected that the mood induction would be equally effective for those high versus low on depressive symptoms, as well as those in the rumination versus reappraisal emotion regulation task conditions. A mixed-design ANOVA was conducted with emotion regulation task condition (rumination/reappraisal) and depression severity (high versus low BDI score) as the between subjects factors, and timepoint as the within

subjects factor. To examine depression severity, participants above the median on the BDI were compared to participants scoring below the median. The dependent variable was sadness ratings. Three timepoints were examined: 1) before the mood induction, 2) post mood-induction, and 3) post emotion regulation induction.

Results revealed a significant main effect of timepoint,  $F(2,160)=77.93, p < .001$ , indicating that there was a change in sadness ratings across timepoints. The interaction between timepoint and emotion regulation condition was not significant,  $F(2,160)=.08, p > .05$ , suggesting that there were no differences between the reappraisal and rumination groups in the pattern of sad mood ratings across the three timepoints (pre/post mood induction/post emotion regulation induction). Paired samples t-tests were conducted to further examine the main effect of timepoint on sadness ratings. Results showed that participants reported greater sadness immediately after compared to before the mood induction,  $t(83)=11.21, p < .001$ , indicating that the mood induction was effective. Sadness ratings of participants in both the rumination and reappraisal groups decreased significantly from post mood-induction to post emotion regulation induction,  $t(83)=-9.26, p < .001$ , indicating that the effect of the mood induction began to subside from pre to post emotion regulation task.

In addition, we obtained a significant main effect of depression severity,  $F(1,80)=5.82, p < .05$ , with individuals with elevated BDI scores reporting greater sadness at all three timepoints. The interaction between timepoint and BDI group (above versus below median), however, was not significant,  $F(2,160)=.08, p > .05$ . Thus, sadness ratings across the three timepoints were consistent across BDI groups.

Table 3.1 below displays mean mood ratings for participants in both the rumination and reappraisal conditions, as well as mean scores for both conditions on demographic variables. In sum, participants in the rumination condition did not differ from those in the reappraisal condition in demographic characteristics, severity of depression symptoms, and habitual use of emotion regulation strategies, including suppression, reappraisal, and rumination. Analyses showed that the mood induction was effective, and that it worked equally well in increasing sad mood for participants in the rumination and reappraisal conditions. Moreover, the emotion regulation task did not have a different effect on mood in the rumination versus reappraisal conditions.

Table 3.1

*Mean Mood Ratings and Demographic Characteristics for Reappraisal and Rumination Conditions*

	<u>Rumination</u> <i>M (SD)</i>	<u>Reappraisal</u> <i>M (SD)</i>
<i>Mood Ratings</i>		
Pre- Mood Induction	2.40 (1.84)	2.37 (2.02)
Post Mood Induction	4.98 (1.97)	4.95 (2.02)
Post Emotion Regulation Task	3.05 (1.89)	2.80 (1.95)
<i>Demographic Characteristics</i>		
BDI	8.73 (8.50)	8.88 (7.88)
ERQ-Suppression	14.53 (4.68)	15.00 (4.68)
ERQ-Reappraisal	28.02 (4.43)	29.78 (6.58)
RSQ	46.33 (15.54)	47.71 (19.30)

*Note.*  $N=84$ , BDI= Beck Depression Inventory, ERQ= Emotion Regulation Questionnaire, RSQ= Response Styles Questionnaire

## II. Association Among Depressive Symptoms and Dependent Variables for Block 1 Scenarios

*Association among depressive symptoms and affective forecasts.* To test the hypothesis that depressive symptoms ( $M=8.80$ ,  $SD=8.16$ ) are associated with more negative affective forecasts, correlation analyses were conducted using only Block 1 scenarios, which were presented before the mood induction and emotion regulation manipulation. For each affective forecast item, participants' mean rating was computed. Means were computed separately for the five negative scenarios and the two positive scenarios. Table 3.2 displays means and standard deviations, as well as correlations with BDI score, for affective forecast ratings to negative and positive scenarios in the first block.

It was expected that greater depressive symptoms would be related to greater intensity and duration of predicted negative emotion in response to negative events. Contrary to our predictions, BDI scores were not related to participants' predictions of how sad, happy, angry, or anxious they would feel in response to negative events. In addition to examining participants' predictions of the specific emotions (sad, happy, angry, anxious), they also provided a general rating of how intense their emotional response would be. BDI scores were not significantly correlated with the intensity of participants' forecasts of their general emotional response to negative events.

It was also expected that higher BDI scores would be associated with forecasts of less intense, briefer positive emotion to positive events. Results did not confirm this hypothesis. Interestingly, however, higher BDI scores were associated with expectations

that one would experience higher levels of negative emotion in response to positive events. Specifically, BDI score was positively correlated with forecasts of sadness,  $r(84) = .25, p < .05$ , and anger,  $r(84) = .23, p < .05$ , in response to positive events.

Table 3.2

*Affective Forecast Variables for Block 1 Scenarios: Descriptive Statistics and Correlation with BDI Total Score*

<i>Affective Forecast Variables</i>	<i>M (SD)</i>	<i>Correlation with BDI</i>
<i>Negative Scenarios</i>		
Intensity	7.31 (1.11)	.16
Sadness	6.03 (1.40)	.18
Happiness	1.65 (.65)	-.03
Anxiety	5.40 (1.62)	.18
Anger	6.50 (1.24)	.02
<i>Positive Scenarios</i>		
Intensity	7.30 (1.29)	-.15
Sadness	1.39 (.76)	.25*
Happiness	7.98 (1.21)	-.08
Anxiety	3.57 (2.08)	.06
Anger	1.30 (.76)	.23*

*Note.*  $N=84$ , BDI= Beck Depression Inventory.

\* $p < .05$

*Association among depressive symptoms and predicted appraisals.* It was further hypothesized that higher BDI scores are associated with a more negative pattern of appraisals for negative and positive events. Specifically, individuals higher in depressive symptoms should expect negative events to be less controllable and more expected, and they should forecast greater personal responsibility for the event occurring, and a greater impact of the event on both self-perception and life in general. In response to positive events, participants higher on the BDI should forecast less personal responsibility and

less impact both on self-perception and in general. In response to positive events, we also predicted that participants with elevated BDI scores would be less likely to expect that positive events would occur, given that they would experience greater feelings of hopelessness toward the future.

Table 3.3 displays the results of the correlation analyses. Results provided some support for the hypothesis that higher levels of depressive symptoms are associated with a more negative pattern of appraising negative events. Individuals with higher BDI scores tended to expect that they would be more responsible for negative events,  $r(84) = .28, p = .01$ , and that negative events would have a greater impact on their lives,  $r(84) = .29, p = .01$ . Contrary to our hypothesis, BDI scores were not related to appraisals for positive events.

Table 3.3

*Appraisal Variables for Block 1 Scenarios: Descriptive Statistics and Correlation with BDI Total Score*

<i>Appraisal Variables</i>	<i>M (SD)</i>	<i>Correlation with BDI</i>
<i>Negative Scenarios</i>		
Predictability	3.47 (1.08)	.12
Responsibility	4.95 (.99)	.28**
Impact	5.44 (1.18)	.29**
Self-view	4.33 (.72)	-.18 <sup>+</sup>
Controllability	4.69 (1.12)	-.09
<i>Positive Scenarios</i>		
Predictability	3.71 (1.48)	-.09
Responsibility	5.36 (1.52)	.05
Impact	5.66 (1.64)	-.05
Self-view	6.48 (1.04)	-.01

*Note.*  $N=84$ , BDI= Beck Depression Inventory, <sup>+</sup>  $p < .10$ , \* $p < .05$ , \*\* $p < .01$

*Association among individual differences in depressive symptoms and expectancies of use and effectiveness of emotion regulation strategies.* To test the hypothesis that higher BDI scores are associated with greater predicted use and predicted effectiveness of maladaptive emotion regulation strategies and less predicted use and predicted effectiveness of more adaptive strategies, correlation analyses were conducted. We examined the association among BDI score and participants' mean ratings across the five negative scenarios in Block 1 of predicted use and effectiveness of reappraisal, rumination, suppression, and distraction. Table 3.4 displays means and standard deviations of ratings of predicted use and effectiveness of each of the four emotion regulation strategies for negative scenarios in Block 1.

Table 3.4 also presents the complete correlation table between BDI total score and ratings of predicted use and predicted effectiveness of emotion regulation strategies. Results generally supported the hypothesis that depressive symptoms are associated with individuals' predictions about emotion regulation strategies. As expected, individuals with higher levels of depressive symptoms reported being more likely to use rumination in response to negative events,  $r(84) = .26, p < .05$ ; interestingly, however, BDI scores were not associated with increased perceived likelihood that rumination would be effective in relieving a negative emotional response.

Participants higher in depressive symptoms were also more likely to predict that certain emotion regulation strategies would be less effective. Whereas it was expected that this would apply only to reappraisal and distraction, which are considered to be more adaptive, bdi score was inversely correlated with expected effectiveness of both

distraction,  $r(84) = -.24, p < .05$ , and suppression,  $r(84) = -.32, p < .01$ . Contrary to expectations, greater depression severity was not associated with a tendency to predict that reappraisal would be less effective.

Table 3.4

*Predictions about Emotion Regulation Strategies for Block 1 Scenarios: Descriptive Statistics and Correlation with BDI Total Score*

<i>Emotion Regulation Variables</i>	<i>M (SD)</i>	<i>Correlation with BDI</i>
Rumination Use	5.06 (1.61)	.26*
Suppression Use	5.83 (1.06)	-.02
Reappraisal Use	4.59 (1.12)	.16
Distraction Use	5.50 (1.41)	.09
Rumination Effectiveness	4.03 (1.37)	-.06
Suppression Effectiveness	5.12 (1.21)	-.32**
Reappraisal Effectiveness	4.26 (1.12)	-.09
Distraction Effectiveness	4.56 (1.43)	-.24*

*Note.*  $N = 84$ , BDI = Beck Depression Inventory

\* $p < .05$ , \*\* $p < .01$

*Summary of Findings on Association among Depressive Symptoms and Dependent Variables.* In sum, results indicated that depressive symptom severity was related to positive, but not negative, affective forecasts. Participants with higher BDI scores predicted experiencing greater sadness and anger in response to positive scenarios. In addition, BDI score was associated with appraisals for negative, but not positive, scenarios. Specifically, participants with higher BDI scores predicted greater personal responsibility for negative scenarios, and that negative scenarios would have a greater impact. Finally, consistent with hypotheses, severity of depression symptoms was associated with predictions about the use and effectiveness of emotion regulation

strategies. Elevated BDI scores were associated with greater tendency to predict using rumination to regulate negative emotion. Interestingly, elevated BDI scores were associated with decreased ratings of predicted effectiveness of both maladaptive (suppression) and adaptive (distraction) strategies.

### III. Effects of Induced Emotion Regulation on Change in Dependent Variables from Block 1 to Block 2

*Effects of induced emotion regulation on affective forecasts.* We expected that induced rumination, compared to reappraisal, would lead to more negative affective forecasts. To test this hypothesis, mixed-model ANOVAs with emotion regulation condition (rumination/reappraisal) as the between-subjects factor and timepoint (pre versus post manipulation) and valence of scenarios (positive/negative) as the within-subjects factors were conducted. In addition, in all ANOVA analyses, we controlled for the order in which scenarios were presented by entering order as a between-subjects factor. Dependent variables were affective forecast ratings, including ratings of how sad, angry, anxious, and happy participants predicted they would be in response to the scenarios. In addition, participants were asked to rate how intense in general their emotional response would be (intensity). For each variable, mean ratings were computed across all scenarios of the same valence (negative versus positive) and within the same block (block 1 versus block 2). Table 3.5 displays descriptive statistics for affective forecast ratings in block 1 compared to block 2 for both the rumination and reappraisal conditions.

Table 3.5

*Descriptive Statistics: Affective Forecast Variables for Block 1 Compared to Block 2 Scenarios by Rumination/Reappraisal Conditions*

	Block 1		Block 2	
	Rumination (N=43)	Reappraisal (N=41)	Rumination (N=43)	Reappraisal (N=41)
<i>Affective Forecast Variables</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
<u><i>Negative Scenarios</i></u>				
Intensity	7.33 (.92)	7.29 (1.30)	7.23 (1.29)	7.07 (1.47)
Sadness	6.25 (1.35)	5.80 (1.44)	5.92 (1.60)	5.65 (1.70)
Happiness	1.57 (.62)	1.74 (.68)	1.63 (.67)	1.54 (.61)
Anxiety	5.23 (1.54)	5.53 (1.72)	4.84 (1.72)	4.85 (1.83)
Anger	6.40 (1.26)	6.60 (1.22)	6.20 (1.63)	6.58 (1.28)
<u><i>Positive Scenarios</i></u>				
Intensity	7.35 (1.16)	7.24 (1.41)	6.98 (1.54)	7.17 (1.51)
Sadness	1.33 (.65)	1.45 (.86)	1.12 (.36)	1.12 (.38)
Happiness	7.99 (1.24)	7.98 (1.20)	8.21 (1.02)	8.09 (1.09)
Anxiety	3.36 (1.88)	3.79 (2.27)	2.90 (1.92)	3.68 (2.15)
Anger	1.15 (.32)	1.45 (.71)	1.13 (.31)	1.12 (.29)

First, we examined differences between participants assigned to ruminate versus reappraise in forecasts of intensity of their emotional response to the scenarios. An interaction between emotion regulation condition, timepoint, and valence of scenarios was expected, which would support the hypothesis that rumination, compared to reappraisal, resulted in the prediction of more intense affect to negative scenarios and less intense positive affect to positive scenarios. Table 3.6 presents the complete ANOVA table. Results did not confirm this hypothesis. Next, we examined group differences in forecasts of happiness, sadness, anxiety, and anger, to negative and positive events. A significant emotion regulation condition by timepoint interaction would support the

hypothesis that rumination compared to reappraisal led to higher ratings of sadness, anxiety, and anger, and lower ratings of happiness, following the manipulation. Once again, results did not indicate that rumination compared to reappraisal resulted in greater negative emotions and less positive emotions in response to scenarios. Unexpectedly, results showed a main effect of timepoint on all participants' predictions of sadness, anger, and anxiety. All participants, regardless of emotion regulation condition, decreased in their predictions of how sad,  $F(1,80) = 9.65, p < .01$ , angry,  $F(1,80) = 6.38, p = .01$ , and anxious,  $F(1,80) = 11.76, p < .01$ , they would feel in response to the scenarios.

Table 3.6

*Analysis of Variance for Affective Forecast Ratings by Timepoint, Emotion Regulation Condition, and Valence*

Source	<i>df</i>	<i>F</i>	$\eta^2$	<i>p</i>
<b>Intensity</b>				
Group	1	.03	.00	.85
Timepoint	1	3.35	.04	.07
Timepoint X Group	1	.21	.00	.65
Timepoint X Group X Valence	1	1.71	.02	.20
Error (group)	80	(3.80)		
Error (timepoint)	80	(.94)		
Error (timepoint X valence)	80	(.71)		
<b>Happiness Forecasts</b>				
Group	1	.03	.00	.87
Timepoint	1	.29	.00	.59
Timepoint X Group	1	.92	.01	.34
Timepoint X Group X Valence	1	.17	.00	.69
Error (group)	80	(1.00)		
Error (timepoint)	80	(.66)		
Error (timepoint X valence)	80	(.78)		

**Sadness Forecasts**

Group	1	.89	.01	.35
Timepoint	1	9.65	.11	.00**
Timepoint X Group	1	.03	.00	.86
Timepoint X Group X Valence	1	.72	.01	.40
Error (group)	80	(2.14)		
Error (timepoint)	80	(.56)		
Error (timepoint X valence)	80	(.61)		

**Anger Forecasts**

Group	1	2.23	.03	.14
Timepoint	1	6.38	.07	.01*
Timepoint X Group	1	.58	.01	.45
Timepoint X Group X Valence	1	3.74	.05	.06+
Error (group)	80	(1.72)		
Error (timepoint)	80	(.27)		
Error (timepoint X valence)	80	(.27)		

**Anxiety Forecasts**

Group	1	1.67	.02	.20
Timepoint	1	11.76	.13	.00**
Timepoint X Group	1	.07	.00	.80
Timepoint X Group X Valence	1	1.47	.02	.23
Error (group)	80	(6.43)		
Error (timepoint)	80	(1.26)		
Error (timepoint X valence)	80	(1.33)		

*Note.* Values in parentheses represent Mean Square Errors

+  $p < .10$ , \* $p < .05$ , \*\* $p < .01$

*Effects of induced emotion regulation on appraisals.* It was expected that rumination, compared to reappraisal, would lead to more negative appraisals. To test this hypothesis, mixed-model ANOVAs with emotion regulation condition (rumination/reappraisal) as the between-subjects factor and timepoint (pre versus post manipulation) and valence of scenarios (positive/negative) as the within-subjects factors were conducted. Dependent variables were appraisal ratings, including ratings of controllability, how expected the event would be, general impact, impact on self-

perception, and responsibility for the event. Table 3.7 displays mean appraisal ratings for Block 1 compared to Block 2 for both the reappraisal and rumination conditions.

Table 3.7

*Descriptive Statistics: Appraisal Ratings for Block 1 Compared to Block 2 Scenarios by Rumination/Reappraisal Conditions*

<i>Appraisal Variables</i>	Block 1		Block 2	
	Rumination ( <i>N</i> =43)	Reappraisal ( <i>N</i> =41)	Rumination ( <i>N</i> =43)	Reappraisal ( <i>N</i> =41)
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
<i>Negative Scenarios</i>				
Predictability	3.38 (.97)	3.56 (1.18)	3.53 (1.04)	3.35 (1.12)
Responsibility	4.85 (.92)	5.05 (1.05)	4.89 (1.06)	4.98 (1.32)
Impact*	5.56 (1.15)	5.31 (1.21)	5.35 (1.60)	5.72 (1.39)
Self-view	4.32 (.60)	4.34 (.84)	4.26 (.78)	4.50 (.93)
Controllability	4.82 (1.04)	4.55 (1.18)	4.87 (1.33)	4.62 (1.33)
<i>Positive Scenarios</i>				
Predictability	3.71 (1.57)	3.72 (1.40)	3.26 (1.25)	3.18 (1.46)
Responsibility	5.36 (1.65)	5.35 (1.38)	5.12 (1.41)	5.77 (1.74)
Impact*	5.73 (1.79)	5.59 (1.47)	5.70 (1.64)	5.96 (1.79)
Self-view	6.38 (1.06)	6.59 (1.02)	6.56 (.99)	6.74 (1.18)

*Note.* \*  $p < .05$

We examined the effect of the emotion regulation task from time 1 to time 2 on each of these variables. An interaction among timepoint, emotion regulation task, and scenario valence, would provide evidence that reappraisal and rumination had different effects on participants' appraisals of positive and negative events. Results from the ANOVAs displayed in Table 3.8 indicated a significant timepoint by emotion regulation condition interaction for ratings of expected impact of scenarios,  $F(1,80) = 6.12, p < .05$ . According to follow-up tests, for participants in the rumination condition, ratings of

expected impact of both positive,  $t(40) = .12, ns$ , and negative scenarios,  $t(40) = 1.17, ns$ , did not change. In contrast, participants in the reappraisal condition were more likely to expect that negative scenarios would impact their lives after compared to before the emotion regulation induction,  $t(40) = -2.25, p < .05$ . No change was found for the positive scenarios,  $t(40) = -1.51, ns$ . In addition, results showed a main effect of timepoint on participants' ratings of how expected scenarios would be,  $F(1,80) = 5.12, p < .05$ . On average, participants tended to decrease in their ratings of how expected both positive and negative scenarios would be.

Table 3.8

*Analysis of Variance for Appraisal Ratings by Timepoint, Emotion Regulation Condition, and Valence*

Source	<i>df</i>	<i>F</i>	$\eta^2$	<i>p</i>
<b>Predictability</b>				
Group	1	.00	.00	.95
Timepoint	1	5.12	.06	.03*
Timepoint X Group	1	.77	.01	.38
Timepoint X Group X Valence	1	.52	.01	.47
Error (group)	80	(2.71)		
Error (timepoint)	80	(1.11)		
Error (timepoint X valence)	80	(1.10)		
<b>Impact</b>				
Group	1	.04	.00	.85
Timepoint	1	1.63	.02	.21
Timepoint X Group	1	6.12	.07	.02*
Timepoint X Group X Valence	1	.14	.00	.70
Error (group)	80	(6.33)		
Error (timepoint)	80	(.94)		
Error (timepoint X valence)	80	(.69)		

<b>Impact on Self-view</b>				
Group	1	2.14	.03	.14
Timepoint	1	2.20	.03	.14
Timepoint X Group	1	.64	.01	.43
Timepoint X Group X Valence	1	.38	.01	.54
Error (group)	80	(.98)		
Error (timepoint)	80	(.45)		
Error (timepoint X valence)	80	(.57)		
<b>Responsibility</b>				
Group	1	1.56	.02	.22
Timepoint	1	.08	.00	.78
Timepoint X Group	1	1.15	.01	.29
Timepoint X Group X Valence	1	2.02	.03	.16
Error (group)	80	(2.89)		
Error (timepoint)	80	(1.20)		
Error (timepoint X valence)	80	(1.43)		
<b>Controllability</b>				
Group	1	1.10	.01	.30
Timepoint	1	.29	.00	.60
Timepoint X Group	1	.00	.00	.96
Error (group)	80	(2.45)		
Error (timepoint)	80	(.47)		

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*Note.*  $N=84$ . Values in parentheses represent Mean Square Errors.

\* $p < .05$ , \*\* $p < .01$

### *Effects of Emotion Regulation Induction on Predictions about Emotion*

*Regulation Strategies.* We next examined the impact of reappraisal versus rumination on participants' predictions about emotion regulation strategies, specifically the use and effectiveness of different strategies in response to negative events. It was expected that rumination compared to reappraisal would result in higher ratings of expected use and effectiveness of maladaptive strategies, including rumination and suppression, and lower ratings of these variables for more adaptive strategies, such as distraction and reappraisal. To test this hypothesis, a series of mixed-model ANOVAs, with timepoint as the within

factor and emotion regulation condition as the between factor, were conducted. The dependent variables included ratings of predicted a) use and b) effectiveness of rumination, reappraisal, distraction, and suppression. Table 3.9 displays descriptive statistics for Block 1 compared to Block 2 scenarios for both the reappraisal and rumination conditions.

Table 3.9

*Descriptive Statistics: Ratings of Emotion Regulation Strategy Predictions for Block 1 Compared to Block 2 Scenarios by Rumination/Reappraisal Conditions*

	Block 1		Block 2	
	Rumination (N=43)	Reappraisal (N=41)	Rumination (N=43)	Reappraisal (N=41)
<i>Emotion Regulation Variables</i>	M (SD)	M (SD)	M (SD)	M (SD)
Rumination Use	5.23 (1.52)	4.88 (1.71)	5.07 (1.62)	5.00 (1.69)
Suppression Use	5.80 (1.06)	5.86 (1.08)	5.65 (1.40)	5.62 (1.14)
Reappraisal Use	4.72 (1.14)	4.44 (1.10)	4.77 (1.27)	4.17 (1.50)
Distraction Use	5.61 (1.25)	5.38 (1.56)	5.51 (1.53)	5.06 (1.73)
Rumination Effectiveness	4.14 (1.32)	3.91 (1.43)	4.22 (1.38)	4.16 (1.65)
Suppression Effectiveness	5.10 (.90)	5.14 (1.47)	5.08 (1.22)	5.10 (1.45)
Reappraisal Effectiveness	4.41 (1.09)	4.09 (1.15)	4.25 (1.19)	3.84 (1.41)
Distraction Effectiveness	4.52 (1.39)	4.61 (1.49)	4.58 (1.40)	4.33 (1.63)

A timepoint by emotion regulation condition interaction would lend support to the hypothesis that the manipulation had an effect on predictions about emotion regulation strategies. Table 3.10 displays results of the ANOVAs for ratings of predicted use of each of the four strategies. Table 3.11 displays results of the ANOVAs for ratings of predicted effectiveness of each of the four strategies. Results did not confirm the hypothesis that the emotion regulation task had an effect on predictions about use and effectiveness of emotion regulation strategies. However, results indicated a significant

main effect of time for predictions about the effectiveness of reappraisal,  $F(1,80) = 4.81$ ,  $p < .05$ . Both groups decreased in their ratings of predicted effectiveness of reappraisal from time 1 to time 2.

Table 3.10

*Analysis of Variance for Ratings of Use of Emotion Regulation Strategies by Timepoint and Emotion regulation condition*

Source	<i>df</i>	<i>F</i>	$\eta^2$	<i>p</i>
<b>Rumination Use</b>				
Group	1	.40	.01	.53
Error (group)	80	(4.62)		
Timepoint	1	.03	.00	.88
Timepoint X Group	1	.98	.01	.33
Error (timepoint)	80	(.85)		
<b>Suppression Use</b>				
Group	1	.01	.00	.94
Error (group)	80	(2.26)		
Timepoint	1	2.7	.03	.10
Timepoint X Group	1	.13	.00	.73
Error (timepoint)	80	(.58)		
<b>Reappraisal Use</b>				
Group	1	2.96	.04	.09
Error (group)	80	(2.68)		
Timepoint	1	1.30	.02	.26
Timepoint X Group	1	2.63	.03	.11
Error (timepoint)	80	(.40)		
<b>Distraction Use</b>				
Group	1	1.36	.02	.25
Error (group)	80	(3.60)		
Timepoint	1	1.7	.02	.20
Timepoint X Group	1	.49	.01	.48
Error (timepoint)	80	(1.02)		

*Note.*  $N = 84$ . Values enclosed in parentheses represent mean square errors.

\* $p < .05$ , \*\* $p < .01$

Table 3.11

*Analysis of Variance for Ratings of Effectiveness of Emotion Regulation Strategies by Timepoint and Emotion regulation condition*

Source	<i>df</i>	<i>F</i>	$\eta^2$	<i>p</i>
<b>Rumination Effectiveness</b>				
Group	1	.25	.04	.62
Error (group)	80	(3.61)		
Timepoint	1	1.8	.02	.18
Timepoint X Group	1	.50	.01	.48
Error (timepoint)	80	(.65)		
<b>Suppression Effectiveness</b>				
Group	1	.01	.00	.91
Error (group)	80	(2.88)		
Timepoint	1	.07	.00	.80
Timepoint X Group	1	.00	.00	.96
Error (timepoint)	80	(.39)		
<b>Reappraisal Effectiveness</b>				
Group	1	2.13	.03	.15
Error (group)	80	(2.5)		
Timepoint	1	4.81	.06	.03*
Timepoint X Group	1	.17	.00	.69
Error (timepoint)	80	(.37)		
<b>Distraction Effectiveness</b>				
Group	1	.06	.00	.81
Error (group)	80	(3.53)		
Timepoint	1	.52	.01	.47
Timepoint X Group	1	1.40	.02	.24
Error (timepoint)	80	(.86)		

*Note.*  $N = 84$ , Values enclosed in parentheses represent mean square errors.

\* $p < .05$ , \*\* $p < .01$

*Summary of Findings on the Effect of the Emotion Regulation Induction on Dependent Variables.* We had predicted that rumination compared to reappraisal would result in more negative affective forecasts and appraisals, as well as an increased preference for less adaptive emotion regulation strategies. Results, however, did not show that the emotion regulation induction had an impact on affective forecasts, appraisals, or predictions about emotion regulation strategies, with two exceptions. Results indicated a significant condition by timepoint interaction on predicted impact of scenarios; whereas participants assigned to ruminate did not change in their ratings of the impact of either positive or negative scenarios, participants assigned to reappraise increased from block 1 to block 2 in their ratings of how much negative scenarios would impact them. It should also be noted that results showed a significant main effect of timepoint on forecasts of anger, anxiety, and sadness, to both negative and positive scenarios. A main effect of timepoint was also found on ratings of how expected scenarios would be, and of how effective reappraisal would be. Participants in both conditions tended to decrease in each of these variables from before to after the emotion regulation induction.

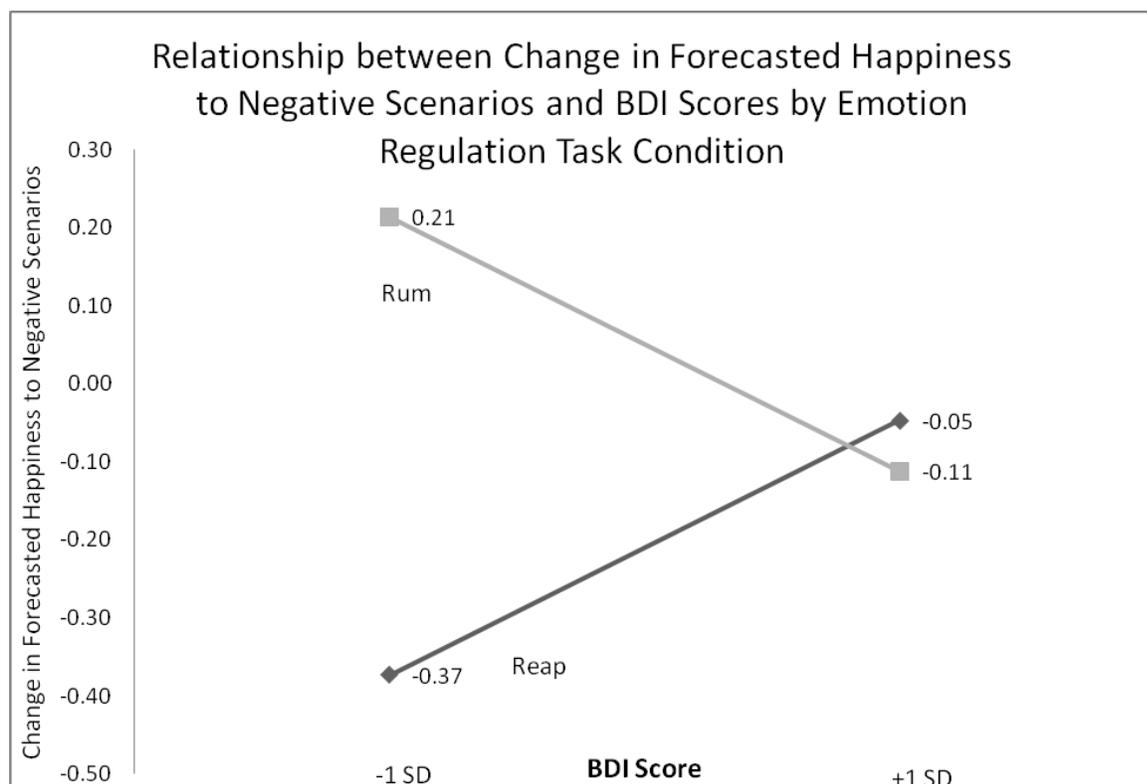
#### IV. Interaction between BDI score and Induced Emotion Regulation on Change in Dependent Variables from Block 1 to Block 2

*Interaction between Depressive Symptoms and Emotion Regulation Condition on Affective Forecasts.* We next examined the interaction between depressive symptoms and emotion regulation condition (rumination/reappraisal) on affective forecasts. Hierarchical regression analyses were conducted with BDI score, which was centered at

its mean, and emotion regulation condition entered as predictors in the first step. Condition was dummy-coded. The interaction between BDI and emotion regulation condition was entered as a predictor in the second step. The dependent variables were change scores from Block 1 to Block 2 for each of the affective forecast variables, including predicted intensity, sadness, happiness, anger, and anxiety. For each variable the mean rating across scenarios in Block 1 was subtracted from the mean rating across scenarios in Block 2. Once again, all five negative scenarios in each block were grouped together and examined separately from the two positive scenarios.

It was expected that the impact of the emotion regulation induction would be greater in individuals higher in depressive symptoms. A significant interaction between BDI total score and emotion regulation condition, which predicts above and beyond BDI total score and emotion regulation condition alone, would lend support to this hypothesis. Complete results of regression analyses are presented in Tables 3.12 - 3.13. The regression analyses for forecasts of happiness to negative scenarios yielded a statistically significant interaction between BDI and emotion regulation condition,  $\beta = -.37, p < .05$ . Together, BDI score, emotion regulation condition, and the interaction between BDI score and emotion regulation induction accounted for 10.1% of the variance in change in happiness forecasts for negative scenarios. Follow-up simple slope analyses were conducted for the rumination and reappraisal conditions. These analyses revealed that BDI score was a marginally significant predictor of change in ratings of predicted happiness from pre to post mood induction and emotion regulation task in the rumination but not the Reappraisal condition. As illustrated in Figure 3.1, for the rumination group,

higher BDI scores were associated with less change in happiness forecasts,  $\beta = -.02$ ,  $SE = .01$ ,  $t(84) = -1.86$ ,  $p = .07$ . Within the Reappraisal condition, BDI score was not significantly related to change in happiness forecasts from pre to post mood induction and emotion regulation task,  $\beta = .02$ ,  $SE = .01$ ,  $t(84) = 1.51$ ,  $ns$ .



*Figure 3.1.* Regression Lines for relations between BDI scores and change in forecast ratings of happiness to negative scenarios by emotion regulation task condition (reappraisal versus rumination) from pre to post mood induction and emotion regulation task (a 2-way interaction).

The regression analyses for intensity, sadness, anxiety, and anger to negative scenarios did not indicate that the manipulation had a different impact on forecasts as a function of depressive symptoms. The regression analyses did not suggest that the effect of the

emotion regulation induction on affective forecasts to positive scenarios was moderated by BDI score.

Regression results showed a significant main effect of BDI score on change in anger ratings to negative scenarios from block 1 to block 2. Thus, regardless of whether they were assigned to ruminate or reappraise, participants with higher levels of depressive symptoms tended to show less change in predictions of anger. Similarly, there was a marginally significant main effect of BDI score on change in sadness ratings to negative scenarios, with participants higher in BDI score showing less change in sadness ratings.

In addition, there was a main effect of condition on change in anger ratings to positive scenarios. Participants in the reappraisal condition, who began in Block 1 with higher predicted anger to positive scenarios, appeared to show a greater decrease in ratings of anger to positive scenarios than did those in the rumination condition.

Table 3.12

*Regression Analyses Predicting Affective Forecast Variables for Negative Scenarios*

Variable	<i>b</i>	<i>SE (B)</i>	$\beta$	$R^2$	$R^2$ Change
Intensity					
BDI	-.02	.01	-.16	.03	
Condition	.12	.22	.06		
BDI*Condition	.00	.03	.00		.00
Sadness					
BDI	-.03	.02	-.20+	.04	
Condition	-.19	.29	-.07		
BDI*Condition	.04	.04	.11		.01

Happiness					
BDI	-0.00	.01	-.04	.04	
Condition	.26	.15	.19+		
BDI*Condition	-.04	.02	-.37*		.06*
Anxiety					
BDI	-.01	.02	-.07	.02	
Condition	.25	.25	.11		
BDI*Condition	.02	.03	.06		.00
Anger					
BDI	-.03	.02	-.24*	.06	
Condition	-.17	.24	-.08		
BDI*Condition	.02	.03	.07		.01

*Note.*  $N = 84$ . BDI = Beck Depression Inventory. BDI and Condition Entered in Step 1. Interaction between BDI and Condition entered in Step 2.  
+ $p < .10$ , \* $p < .05$

Table 3.13

*Regression Analyses Predicting Affective Forecast Variables for Positive Scenarios*

Variable	$b$	$SE (B)$	$\beta$	$R^2$	$R^2$ Change
Intensity					
BDI	.00	.02	.00	.01	
Condition	-.30	.39	-.09		
BDI*Condition	.02	.05	.04		.00
Sadness					
BDI	-.01	.01	-.12	.02	
Condition	.12	.17	.08		
BDI*Condition	-.03	.02	-.14		.02
Happiness					
BDI	-.01	.02	-.06	.00	
Condition	.11	.35	.03		
BDI*Condition	.01	.04	.03		.00
Anxiety					
BDI	.02	.03	.06	.01	
Condition	-.35	.44	-.09		
BDI*Condition	-.06	.05	-.11		.01

Anger					
BDI	-.01	.01	-.13	.09*	
Condition	.31	.12	.27*		
BDI*Condition	-.02	.02	-.13		.02

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*Note.*  $N = 84$ . BDI = Beck Depression Inventory. BDI and Condition Entered in Step 1. Interaction between BDI and Condition entered in Step 2.  
+ $p < .10$ , \* $p < .05$

*Interaction between Depressive Symptoms and Emotion Regulation Induction on*

*Appraisals.* To investigate the hypothesis that the effect of the emotion regulation task on appraisals would differ as a function of depressive symptoms, hierarchical regression analyses were used. Once again, BDI scores and condition were entered as predictors in the first step. BDI scores were centered at their mean, and condition was dummy coded. The product of centered BDI scores and emotion regulation condition was entered into the second step. The dependent variables were change scores from Block 1 to Block 2 for each appraisal variable, including predictability, general impact, impact on self-view, responsibility, and controllability. For each variable the mean rating across scenarios in Block 1 was subtracted from the mean rating across scenarios in Block 2. Negative scenarios were examined separately from positive scenarios. As evident in Tables 3.14 – 3.15, regression analyses did not support this hypothesis for negative scenarios nor positive scenarios. The interaction between BDI score and emotion regulation condition did not reliably predict participants' expectations of how controllable, expected, and due to their own responsibility scenarios would be, nor how much scenarios would impact their lives and self-perception.

However, there was a significant main effect of BDI score on change in predictions of the controllability of negative scenarios, with participants higher in depressive symptoms showing less change in predicted controllability of negative events. There were also main effects of BDI score and of condition on change in predictions of the impact of negative scenarios from Block 1 to Block 2. Similarly, those higher in depressive symptoms showed less change from Block 1 to Block 2 in predicted impact of negative scenarios. Those in the rumination condition, compared to the reappraisal condition, also tended decrease in their predictions of how much both negative and positive scenarios would impact them; in contrast, those assigned to reappraise increased in their predictions of the impact of both negative and positive scenarios.

Table 3.14

*Regression Analyses Predicting Appraisal Variables for Negative Scenarios*

Variable	<i>b</i>	<i>SE (B)</i>	$\beta$	$R^2$	$R^2$ Change
Control					
BDI	-.04	.01	-.28*	.08*	
Condition	-.04	.22	-.02		
BDI*Condition	.00	.03	.01		.00
Responsibility					
BDI	-.01	.01	-.05	.01	
Condition	.11	.23	.05		
BDI*Condition	-.03	.03	-.12		.02
Predictability					
BDI	-.01	.02	-.08	.03	
Condition	.36	.25	.16		
BDI*Condition	.04	.03	.13		.02
Impact					
BDI	-.03	.02	-.20+	.10*	
Condition	-.63	.25	-.26*		
BDI*Condition	.01	.03	.04		.00

Impact on Self-view				
BDI	.00	.01	.02	.03
Condition	-.22	.16	-.16	
BDI*Condition	-.00	.02	-.02	.00

*Note.*  $N = 84$ . BDI = Beck Depression Inventory. BDI and Condition Entered in Step 1. Interaction between BDI and Condition entered in Step 2.  
+  $p < .10$ , \* $p < .05$

Table 3.15

*Regression Analyses Predicting Appraisal Variables for Positive Scenarios*

Variable	<i>b</i>	<i>SE (B)</i>	$\beta$	$R^2$	$R^2$ Change
Predictability					
BDI	.00	.03	.01	.00	
Condition	.08	.44	.02		
BDI*Condition	.00	.05	.00		.00
Responsibility					
BDI	-.04	.03	-.17	.05	
Condition	-.67	.46	-.16		
BDI*Condition	.02	.06	.04		.00
Impact					
BDI	.03	.02	.11	.03	
Condition	-.41	.38	-.12		
BDI*Condition	.05	.05	.12		.01
Impact on Self-view					
BDI	.01	.02	.03	.00	
Condition	.02	.31	.01		
BDI*Condition	-.00	.04	-.00		.00

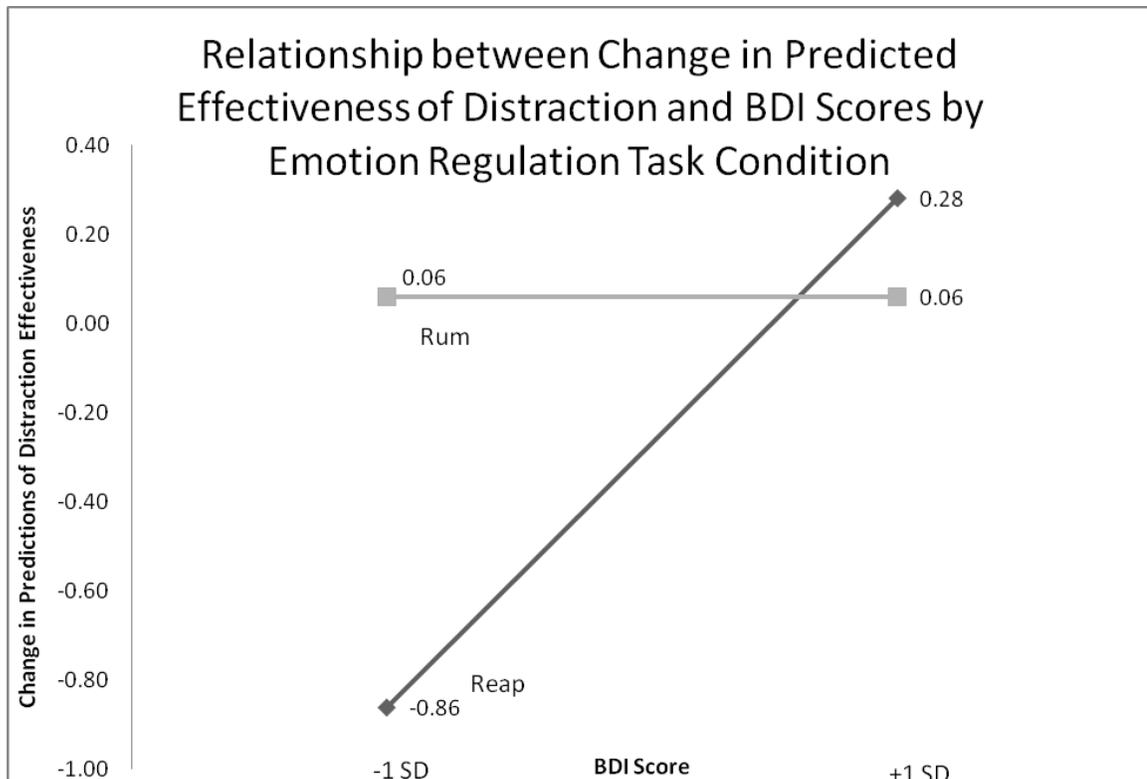
*Note.*  $N = 84$ . BDI = Beck Depression Inventory. BDI and Condition Entered in Step 1. Interaction between BDI and Condition entered in Step 2.  
+ $p < .10$ , \* $p < .05$

*Interaction between BDI and emotion regulation condition on predictions about*

*Emotion Regulation Strategies.* Finally, it was expected that the effect of the emotion

regulation task on beliefs about emotion regulation strategies would depend on severity of depressive symptoms. Hierarchical regression analyses were used to test this hypothesis, with BDI score centered at the mean and dummy-coded condition entered as predictors in the first step. The interaction between BDI score and condition was entered in the second step. Dependent variables were change in ratings of expected 1) use and 2) effectiveness of rumination, distraction, suppression, and reappraisal, from pre to post mood induction and emotion regulation task. A significant BDI by emotion regulation condition interaction would provide evidence in support of the hypothesis that the emotion regulation induction would have a more pronounced effect in individuals with more severe symptoms on predictions about emotion regulation strategies. Results of the regression analyses are displayed in tables 3.16 - 3.17. Results did not demonstrate that the impact of reappraisal versus rumination on predictions about the use of any of the emotion regulation strategies was affected by BDI score. However, the interaction between BDI score and emotion regulation condition significantly predicted change in participants' ratings of the effectiveness of distraction,  $\beta = -.22$ ,  $p < .05$ . The regression model including BDI score, emotion regulation condition, and their interaction accounted for 8.7% of the variance in change in ratings of predicted effectiveness of distraction. Follow-up simple slope analyses were conducted for the rumination and reappraisal conditions. These analyses revealed that BDI score was a significant predictor of change in ratings of distraction effectiveness in the reappraisal but not the rumination condition. As seen in Figure 3.2, within the reappraisal condition, higher BDI scores were related to greater change in ratings of distraction effectiveness from time 1 to time 2,  $\beta = .07$ ,  $SE$

$=.03$ ,  $t(84) = 2.46$ ,  $p < .06$ . Within the rumination condition, however, BDI score was not significantly related to change in ratings of distraction effectiveness,  $\beta = -.01$ ,  $SE = .02$ ,  $t(84) = -.39$ , *ns*.



*Figure 3.2.* Regression Lines for relations between BDI scores and change in ratings of predicted effectiveness of distraction by emotion regulation task condition (reappraisal versus rumination) from pre to post mood induction and emotion regulation task (a 2-way interaction).

Contrary to expectations, the effect of rumination versus reappraisal on change in predicted effectiveness of rumination, reappraisal, and suppression, was not affected by BDI score.

Table 3.16

*Regression Analyses Predicting Ratings of Predicted Emotion Regulation Strategy Use*

Variable	<i>b</i>	<i>SE (B)</i>	$\beta$	<i>R</i> <sup>2</sup>	<i>R</i> <sup>2</sup> Change
Rumination					
BDI	-.02	.02	-.15	.04	
Condition	-.29	.28	-.11		
BDI*Condition	-.03	.04	-.10		.01
Distraction					
BDI	-.01	.02	-.04	.01	
Condition	.21	.32	.07		
BDI*Condition	-.04	.04	-.11		.01
Reappraisal					
BDI	.00	.01	.01	.03	
Condition	.33	.20	.18		
BDI*Condition	-.02	.03	-.07		.01
Suppression					
BDI	-.01	.01	-.09	.01	
Condition	.08	.23	.04		
BDI*Condition	.01	.03	.05		.00

*Note.* *N* = 84. BDI = Beck Depression Inventory. BDI and Condition Entered in Step 1. Interaction between BDI and Condition entered in Step 2.

+*p* < .10, \**p* < .05

Table 3.17

*Regression Analyses Predicting Ratings of Predicted Emotion Regulation Strategy Effectiveness*

Variable	<i>b</i>	<i>SE B</i>	$\beta$	<i>R</i> <sup>2</sup>	<i>R</i> <sup>2</sup> Change
Rumination					
BDI	.02	.02	.12	.02	
Condition	-.17	.25	-.07		
BDI*Condition	-.03	.03	-.11		.01
Suppression					
BDI	.01	.01	.07	.00	
Condition	.03	.20	.01		
BDI*Condition	-.04	.03	-.16		.03

Reappraisal				
BDI	.01	.01	.09	.01
Condition	.09	.20	.05	
BDI*Condition	-.04	.02	-.18	.03
Distraction				
BDI	.02	.02	.15	.04
Condition	.35	.29	.13	
BDI*Condition	-.07	.04	-.22*	.05*

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*Note.*  $N = 84$ . BDI = Beck Depression Inventory. BDI and Condition Entered in Step 1. Interaction between BDI and Condition entered in Step 2.  
 $+p < .10$ ,  $*p < .05$

*Summary of Findings on Interaction among Depressive Symptoms and Emotion*

*Regulation Induction.* In sum, results of the hierarchical regression analyses did not support our hypothesis that impact of the emotion regulation task on the dependent variables would be influenced by BDI score. There were two exceptions, however. Results indicated a significant interaction effect between BDI score and emotion regulation condition on change in happiness forecasts. In the rumination condition, higher BDI scores were associated with less change in happiness forecasts; however, in the reappraisal condition, BDI scores were unrelated to change in happiness forecasts. Secondly, an interaction between BDI scores and emotion regulation condition was found on change in predicted distraction effectiveness. In the reappraisal condition, higher BDI scores were associated with greater change in ratings of distraction effectiveness. In contrast, in the rumination condition, BDI scores were unrelated to change in predictions of distraction effectiveness.

## V. Association between Additional Individual Difference Measures and Dependent Variables for Block 1 Scenarios

*Association between habitual use of strategies and predictions about use and effectiveness of strategies.* It was expected that habitual use of emotion regulation strategies (as measured by the ERQ and RSQ) would be associated with ratings of predicted use and effectiveness of these strategies in response to negative scenarios. Table 3.18 displays correlations among the ERQ suppression and reappraisal subscale scores, RSQ total score, and ratings of predicted use and effectiveness for each emotion regulation strategy. First, correlations were conducted among self-reported use of suppression and reappraisal in daily life (ERQ) and predictions about use and effectiveness of these strategies in response to negative scenarios. Tendency to use reappraisal in daily life was associated with expectations that both reappraisal and suppression would be effective in response to negative scenarios. However, those who tended to use reappraisal more also expected that distraction would be less effective in response to negative scenarios. We also examined the correlation between habitual use of rumination (RSQ) and predictions about use and effectiveness of rumination in response to scenarios. As expected, tendency to ruminate in daily life was associated with a greater tendency to predict use of rumination in response to negative scenarios. RSQ score was also related to a greater tendency to expect that one would use distraction in response to negative scenarios. Overall, greater habitual use of rumination was associated with decreased ratings of the predicted effectiveness of emotion regulation strategies in response to negative scenarios. Greater RSQ score was associated with

significantly lower expectations that suppression would be effective. Although those with higher RSQ scores had been more likely to expect that they would use rumination, they were not significantly more likely to expect that rumination would be effective.

Table 3.18

*Correlations between ERQ, RSQ and Predictions of Use and Effectiveness of Emotion Regulation Strategies*

<i>Emotion Regulation Variables</i>	<i>ERQ Suppression</i>	<i>ERQ Reappraisal</i>	<i>RSQ Rumination</i>
Rumination Use	-.04	-.27*	.22*
Suppression Use	.01	.15	.07
Reappraisal Use	-.08	.13	.16
Distraction Use	.00	-.24*	.21+
Rumination Effectiveness	.17	.01	-.10
Suppression Effectiveness	.21+	.37**	-.26*
Reappraisal Effectiveness	.10	.36*	-.11
Distraction Effectiveness	.20	.09	-.06

*Note.*  $N=84$ . ERQ = Emotion Regulation Questionnaire, RSQ = Response Styles Questionnaire. + $p < .10$ , \* $p < .05$ , \*\* $p < .01$

*Association Among Individual Difference Measures and Affective Forecasts, Predicted Appraisals, and Predictions about Emotion Regulation Strategies.* We next examined the association among the dependent variables and trait levels of anxiety, measured by the STAI-T. Results of correlation analyses are presented in Tables 3.19 - 3.21. Interestingly, trait anxiety was correlated with ratings of the intensity of affect and sadness in response to negative scenarios. Moreover, trait anxiety was also associated with forecasts in response to positive scenarios. Participants higher in trait anxiety anticipated experiencing more sadness and more anger in response to positive scenarios.

Trait anxiety was associated with predicted appraisals to negative, but not positive, scenarios. Specifically, participants with higher levels of trait anxiety predicted that negative scenarios would have a greater impact on their lives. In addition, there was a marginally significant association among trait anxiety and ratings of predicted controllability and impact on self-perception. Participants higher on trait anxiety predicted having less control over negative scenarios, and that negative scenarios would have less of an impact on their self-perception. There was also a marginally significant association among trait anxiety and ratings of responsibility and predictability of negative scenarios. Higher trait anxiety was associated with increased perceived responsibility for negative scenarios, as well as a greater tendency to expect that negative scenarios will occur.

Trait anxiety was also associated with predicted use and effectiveness of strategies for regulation emotional responses. Specifically, participants higher on trait anxiety expected to use more rumination; however, trait anxiety was not related to predictions about the effectiveness of rumination. Higher trait anxiety was also associated with decreased ratings of the predicted effectiveness of suppression and distraction.

We also examined the association among personality traits, measured by the NEO-S, and the dependent variables. Results of correlation analyses are presented in Tables 3.19 – 3.21. Affective forecasts to negative scenarios were not correlated with personality traits, with one exception. Higher Openness was associated with predictions of more intense emotional responses to negative scenarios. For positive scenarios, we

found that Openness was correlated with expectations of less sadness and less anger.

Conscientiousness was also associated with less predicted anger to positive scenarios.

The Big Five personality traits were not associated with predicted appraisals to negative scenarios, with two exceptions. Higher Openness was associated with greater predicted responsibility for negative scenarios. In addition, participants higher on Conscientiousness were less likely to expect that negative scenarios would occur. With regards to positive scenarios, higher Conscientiousness was correlated with higher ratings of predicted impact of scenarios on self-perception. No other personality traits were associated with predicted appraisals to positive scenarios.

Lastly, we examined the association among the Big Five personality traits and predictions about emotion regulation strategies. We found that higher levels of Extraversion were associated with greater predicted use and effectiveness of suppression. In addition, higher levels of Openness were associated with greater predicted use of both suppression and reappraisal, as well as greater predicted effectiveness of both suppression and reappraisal.

Table 3.19

*Correlations between STAI-T, NEO-S and Affective Forecasts*

<i>Individual Difference Measures</i>	<i>STAI-T</i>	<i>N</i>	<i>E</i>	<i>O</i>	<i>A</i>	<i>C</i>
<i>Negative Scenarios</i>						
Intensity	.25*	.07	-.04	.27+	.21	-.04
Sadness	.21+	.11	.06	.02	.15	.17
Happiness	-.09	.03	.14	-.16	-.25	-.04
Anxiety	.28*	.00	-.08	.19	.28	-.05
Anger	.09	-.00	.06	.15	.24	-.02

Positive Scenarios

Intensity	-.10	.15	.11	.19	.18	.17
Sadness	.26*	-.06	-.02	-.28+	-.12	-.03
Happiness	-.04	.13	.09	.22	.03	.24
Anxiety	.08	.06	.05	.05	-.20	-.01
Anger	.29**	-.06	-.11	-.30+	-.15	-.30+

Note.  $N = 84$ . STAI-T = State Trait Anxiety Inventory- Trait, N = Neuroticism, E = Extraversion, O = Openness, A = Agreeableness, C = Conscientiousness.  
 $+p < .10$ ,  $*p < .05$ ,  $**p < .01$

Table 3.20

*Correlations between STAI-T, NEO-S and Predicted Appraisals*

<i>Individual Difference Measures</i>	<i>STAI-T</i>	<i>N</i>	<i>E</i>	<i>O</i>	<i>A</i>	<i>C</i>
<u>Negative Scenarios</u>						
Predictability	.19+	-.09	-.08	-.01	-.05	-.39*
Responsibility	.19+	.09	.09	.35*	.03	-.06
Impact	.37**	.09	.06	.17	.25	.02
Self-view	-.19+	.02	.00	-.02	-.15	.10
Controllability	-.19+	.06	.02	-.08	.21	.14
<u>Positive Scenarios</u>						
Predictability	-.07	-.08	.01	-.18	.11	-.09
Responsibility	-.11	.09	.11	.22	.04	.15
Impact	-.04	.16	.11	.25	.02	.20
Self-view	-.00	.12	.16	.08	-.15	.42**

Note.  $N = 84$ . STAI-T = State Trait Anxiety Inventory- Trait, N = Neuroticism, E = Extraversion, O = Openness, A = Agreeableness, C = Conscientiousness.  
 $+p < .10$ ,  $*p < .05$ ,  $**p < .01$

Table 3.21

*Correlations between STAI-T, NEO-S and Predictions about ER Strategies*

<i>Individual Difference Measures</i>	<i>STAI-T</i>	<i>N</i>	<i>E</i>	<i>O</i>	<i>A</i>	<i>C</i>
Rumination Use	.24*	.14	-.07	.19	.04	-.06
Suppression Use	-.18	-.04	.22*	.32*	.01	-.06
Reappraisal Use	-.00	.11	.05	.34*	.08	.10
Distraction Use	.17	.14	.03	-.05	-.02	.06
Rumination Effectiveness	-.10	.14	.09	.12	.23	-.11

Suppression Effectiveness	-.45**	-.04	.25*	.34*	.09	.00
Reappraisal Effectiveness	-.18	.12	.05	.43*	.10	.07
Distraction Effectiveness	-.23*	.15	.09	.00	.12	.09

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*Note.*  $N = 84$ . STAI-T = State Trait Anxiety Inventory- Trait, N = Neuroticism, E = Extraversion, O = Openness, A = Agreeableness, C = Conscientiousness.  
 $+p < .10$ ,  $*p < .05$ ,  $**p < .01$

## Chapter 4: Discussion

Given that depression is a prevalent and disabling condition, which carries great societal costs, there is a need to better understand factors that influence vulnerability and maintenance of the disorder. Depressive cognition and biased processing of emotional material is proposed to be associated with current depressive episodes, but it may also play a critical role in maintaining episodes and increasing risk for relapse. Most studies, however, have examined the processing of current or past material, as opposed to future-oriented thinking. Biases in the processing of future events may be particularly detrimental, however, given the role of hopelessness in influencing risk for the disorder, and a central feature of the disorder, anhedonia. Thus, this study aimed to explore the nature of affective forecasting in depression. In light of the difficulties with emotion regulation seen in depression, this study also sought to explore the relationship between affective forecasting and emotion regulation. Specifically, we examined the impact of rumination and reappraisal on affective forecasts, as well as whether depressive symptoms are associated with predictions about the use and effectiveness of various emotion regulation strategies.

### *Association among depressive symptoms and affective forecasts, appraisals, and predictions about the use and effectiveness of different emotion regulation strategies*

The first question addressed in this study was whether depressive symptoms are associated with affective forecasts, appraisals, and predictions about the use and effectiveness of various emotion regulation strategies. The results provide support for our hypothesis that depressive symptoms are associated with individual differences in

affective forecasts. We expected that depressive symptoms are correlated with forecasts of more intense negative affect in response to negative events and less intense positive affect in response to positive events. Interestingly, whereas no correlations were obtained for negative events, depression was associated with higher levels of expected negative affect in response to positive events. Participants with more severe symptoms of depression were more likely to expect that they would experience sadness and anger in response to positive events.

This study was novel in that no previous studies have examined affective forecasting among depressed individuals. The finding that depressive symptoms were related to affective forecasts to positive scenarios is surprising given that most research on cognitive biases in depression has demonstrated biases in the processing of negative, as opposed to positive, emotional material (Mathews & MacLeod, 2005). Such studies, however, have focused primarily on the processing of current or past material, as opposed to future-directed processing. The few studies examining predictions into the future have focused on the likelihood that negative events will occur, as opposed to predictions of emotional responses to future events (e.g. Pyszczynski et al., 1987). Such studies have found that depressed individuals tend to predict that they will experience more negative events in the future. Thus, our finding that BDI score is related to affective forecasts to positive, but not negative scenarios, differs from previous studies on cognitive biases in depression. It should be noted, however, that some studies examining cognitive biases in depression have found biases in the processing of positive material in addition to or instead of negative biases. For example, Joormann and Gotlib (2006) found that

participants diagnosed with major depression, in addition to being faster to perceive sad expressions, exhibited greater difficulty identifying happy facial expressions. In addition, Joormann and Siemer (2004) found that, whereas recalling happy memories was effective for nondysphoric individuals in regulating negative mood, this strategy was not effective for dysphoric individuals. Moreover, overgeneral memory biases seen in depression have been found in response to positive in addition to negative cue words in some studies (see Williams et al., 2007 review). One explanation that has been put forth for this finding is that positive cue words, when they are self-referent, can draw attention to the absence of a happy mood state, which can lead to rumination about one's shortcomings and the reasons for the negative mood state, in turn worsening mood (Williams et al., 2007). The finding that individuals with elevated depression predict experiencing more negative emotions to positive scenarios may help to illuminate a common symptom of depression, anhedonia, or a reduced interest in or ability to experience pleasure from enjoyable activities. If individuals prone to depression forecast positive emotional responses to positive events that are contaminated by negative emotions, this could lead to feelings of decreased motivation to seek out pleasurable activities.

In addition, individuals endorsing more depressive symptoms were more likely to indicate negative appraisals of unpleasant future events. Greater severity of depressive symptoms was associated with higher ratings of personal responsibility for future negative events, as well as with higher ratings of the impact of these events on participants' lives. These findings are largely consistent with previous studies supporting the hopelessness theory of depression, which holds that depressed individuals have a

pessimistic attributional style that involves attributing negative events to internal, stable, and global causes, which in turn leads to feelings of hopelessness toward the future, and ultimately depression (Abramson et al., 1989). Hopelessness is defined as the belief that one cannot control the outcomes of future events, as well as the belief that negative outcomes are certain, and is thought to play a causal role in the development of depression. Indeed, studies have shown that individuals who tend to blame themselves for negative events, to generalize these shortcomings to many different situations, and to expect that this will not change, are vulnerable to developing depression (Hankin et al., 2001; Alloy et al., 2006). The current study expands upon these findings by demonstrating that these negative attributions may extend into predictions about future events. An understanding of how depressed individuals appraise future events may be useful in furthering our understanding of the development of hopelessness in depression.

The results also lend some support to our hypothesis that participants with elevated symptoms of depression are more likely to anticipate using maladaptive emotion regulation strategies in response to negative events. Higher BDI scores were correlated with a greater tendency to expect the use of rumination in response to negative events. Severity of depressive symptoms, however, was not related to predictions of lesser use of reappraisal or distraction.

This finding is not surprising given that numerous studies have demonstrated that depressed individuals ruminate more frequently than nondepressed individuals, and that more frequent use of rumination is related to recurrences of depression (Nolen-Hoeksema, 1991; for a review, see Nolen-Hoeksema et al., 2008). It is interesting to find

that a preference to use rumination also applies to depressed individuals' predictions toward a range of specific negative scenarios in the future. This might suggest that individuals with depression may be aware in advance that they are using rumination to cope with negative situations. Research should further explore reasons given by depressed individuals for deciding to use rumination.

We had also expected that depressive symptoms would be associated with predictions of increased effectiveness of maladaptive strategies, including rumination and suppression, and decreased effectiveness of reappraisal and distraction. Interestingly, however, depressive symptoms were associated with a tendency to expect that both maladaptive and adaptive strategies would be less effective. Specifically, participants with higher levels of depression tended to expect that both distraction and suppression would be less effective. This is a potentially important finding, because if depressed individuals believe these strategies to be less effective, they may be less likely to use these strategies. Instead, they may be more likely to use rumination, which has been shown to be less effective than distraction in reducing negative affect (Nolen-Hoeksema et al., 2008) and to carry many negative consequences for problem-solving (Lyubomirsky et al., 1999) and interpersonal functioning (Nolen-Hoeksema and Davis, 1999). Indeed, we found that participants with elevated depression scores expected to use more rumination. Moreover, depressed individuals may exhibit cognitive deficits which underlie both their difficulty using distraction and suppression, and their tendency to ruminate. Research has demonstrated that depressed individuals have difficulty inhibiting negative emotional material from working memory, a finding that has helped

to explain why they get caught in a cycle of ruminating about negative events (Joormann, 2004). This could explain why we found that they predict using rumination more, and why in a previous study it was found that depressed individuals induced to ruminate predicted they would use distraction less even though they acknowledged it would be helpful (Lyubormirsky and Nolen-Hoeksema, 1993).

In recent studies, it has been argued that it is probably most adaptive to be able to use a variety of different strategies depending on the situation, including strategies, such as suppression, which may become maladaptive if used inflexibly (Bonanno et al., 2004; Joormann, Yoon & Siemer, in press). In fact, Bonnano and colleagues (2004) found that individuals who were able both to suppress and to enhance emotion exhibited greater adjustment two years later. Similarly, Liverant et al. (2008) found that suppression could be effective even for depressed individuals, depending on how much anxiety they had about having feelings of depression. If depressed individuals believe that these strategies will not be effective for them, however, they will be less likely to use them and will have a narrower range of strategies they are able to draw from to cope with different types of stressors. As Bonnano and colleagues argued, the majority of studies comparing the effectiveness and consequences of different emotion regulation strategies have used between-subjects designs looking only at two strategies at a time (e.g. Gross, 1998; Gross & John, 2003; Lyubomirsky et al., 1999). There is a need for studies using within-subjects designs to examine how the use and effectiveness of a variety of different strategies are interrelated, and how this may help to explain vulnerability to depression.

In sum, we found that elevated depression scores were associated with predictions of more sadness and anger in response to positive events but not negative events. If depressed individuals expect to experience more intense negative emotions to positive events, this may lead to symptoms of anhedonia and hopelessness, and to decreased motivation to pursue positive events. In addition, we found that elevated BDI scores were correlated with predicted appraisals to negative, but not positive events, an interesting finding because it suggests that pessimistic attributional style seen in depression may extend to future events. Lastly, we found that BDI scores were correlated with predictions of increased use of rumination and decreased effectiveness of suppression and distraction, which may impact the types of strategies depressed individuals use, leading to less flexibility. We also discussed how the relation among BDI score and predicted use and effectiveness of strategies may reflect cognitive biases in depression, such as decreased ability to inhibit negative emotional material.

*Effects of induced emotion regulation on affective forecasts, appraisals, and predictions about the use and effectiveness of emotion regulation strategies*

The second question addressed in this study was whether the use of a specific emotion regulation strategy when experiencing negative mood changes affective forecasts, appraisals, and predictions about the use and effectiveness of emotion regulation strategies. In light of previous research that has demonstrated that rumination can lead to difficulties with problem-solving (Lyubomirsky et al., 1999), interpersonal interactions (Nolen-Hoeksema and Davis, 1999), and cognitive functioning (e.g. Sutherland and Bryant, 2007), we expected that rumination compared to reappraisal

following the negative mood induction would lead to more negative affective forecasts. Contrary to our expectations, however, induced rumination and reappraisal did not affect affective forecasts.

The induced emotion regulation strategy did also not affect appraisals of future events, with the exception of predicted impact of scenarios on participants' lives. Whereas participants who ruminated were less likely to expect a high impact of negative events on their lives, participants assigned to reappraise after the negative mood induction expected that negative events would impact them more strongly. This was an unexpected finding, as we had expected that rumination would lead to predicting an increased impact of negative scenarios and decreased impact of positive scenarios, and that the reverse pattern would be found for those assigned to reappraise. This finding may indicate that reappraisal heightened the degree to which participants predicted they would be affected by these events.

Results of this study also did not support our hypothesis that rumination compared to reappraisal would cause participants to expect the use of maladaptive strategies in response to future events or would change the expected effectiveness of emotion regulation strategies. Prior studies have not addressed the question of whether using emotion regulation techniques, such as rumination, influences individuals' attitudes and preferences towards these strategies. Given that predictions about use and effectiveness of strategies may be based in more long-standing patterns of coping and attitudes towards different techniques, it seems possible that these predictions may be more resistant to

change and would not be influenced by the brief emotion regulation induction used in this study.

Finally, we examined the question of whether the effect of the emotion regulation manipulation would be greater among those with elevated symptoms of depression. We obtained a significant interaction between induced emotion regulation strategy and BDI score on changes in predicted happiness in response to negative events. For participants induced to ruminate, we obtained an inverse correlation between BDI scores and change in predicted happiness. For participants with elevated depression symptoms, rumination appeared to have less of an effect on happiness forecasts to negative scenarios.

Participants with lower BDI scores, who were assigned to ruminate, tended to report greater happiness in response to negative scenarios after the emotion regulation induction compared to before. No such correlation was obtained in the reappraisal group.

Interestingly, within the Reappraisal condition, higher BDI scores were related to greater change in ratings of distraction effectiveness from time 1 to time 2. However, within the Rumination condition, BDI score was not related to change in ratings of distraction effectiveness from time 1 to time 2. Thus, only for people with high BDI scores did the reappraisal condition change predictions of the effectiveness of reappraisal. In sum, these findings may indicate that rumination and reappraisal are not always maladaptive or adaptive, but that the impact of these strategies may depend on severity of depression symptoms.

*Summary of Results on Effect of Emotion Regulation Induction on Dependent Variables*

Contrary to our hypotheses, the emotion regulation induction did not impact participants' forecasts, appraisals, or predictions about emotion regulation strategies. However, there was an unexpected finding regarding the impact of the emotion regulation task on predictions of the impact of scenarios. We found that reappraisal led to increased ratings of the predicted impact of negative scenarios, which may indicate that reappraisal heightens individuals' estimation of the impact of these events.

In addition, our hypothesis that the impact of the emotion regulation induction would be more pronounced among individuals with elevated BDI scores was not supported. Results did not indicate significant interactions between BDI scores and emotion regulation condition on affective forecasts, appraisals, and predictions about emotion regulation strategies, with the exceptions of analyses on predicted happiness to negative scenarios and predicted distraction effectiveness.

*Relation among Predictions about Emotion Regulation Strategies and Measures of Habitual Use of Emotion Regulation Strategies*

Consistent with our hypotheses, we found that participants' predictions of the use of emotion regulation strategies in response to negative scenarios were correlated with measures of habitual rumination (RSQ), suppression (ERQ), and reappraisal (ERQ) in daily life. Specifically, participants who tended to habitually ruminate in daily life were also more likely to expect using rumination in response to negative scenarios. Further, higher RSQ scores were correlated with lower expectations that suppression would be effective. The habitual use of suppression (ERQ) was associated with a greater tendency

to predict that suppression would be effective in response to negative scenarios. Whereas we had predicted that greater habitual use of reappraisal would be associated with greater predicted use and effectiveness of adaptive strategies (i.e. distraction and reappraisal), this was not the case. Participants with higher ERQ reappraisal scores were less likely to expect using both rumination and distraction. In addition, higher ERQ reappraisal scores were associated with a greater tendency to expect that both suppression and reappraisal would be effective.

The finding that use of emotion regulation strategies in daily life corresponded with participants' predictions about different strategies is interesting in that there have been surprisingly few studies examining how people's conscious beliefs about emotion regulation strategies relate to the strategies they actually use in daily life. It is possible that there are both automatic and more controlled, conscious factors influencing both people's selection of strategies and ability to implement them effectively (Joormann and D'Avanzato, in preparation). For instance, automatic factors, including attentional biases, may lead a person to be more likely to use certain strategies, such as avoidance. Similarly, it is possible that people will use strategies that they believe will be effective more frequently. To this point, however, little is known about the relative importance of automatic factors versus conscious beliefs about strategies. Given that individuals' predictions about the use and effectiveness of strategies in the future was correlated with the strategies they reported actually using in daily life, participants may have an awareness of the strategies they are selecting in daily life. Conscious beliefs about the use and effectiveness of strategies may play a role in the selection of strategies on a daily

basis. Future studies are needed to further explore the role of beliefs about use and effectiveness of strategies in the habitual selection of strategies, for example studies examining whether education about the advantages and disadvantages of different strategies has an impact on use of strategies. Such research would have useful implications for treatment of disorders, such as depression, marked by difficulties regulating emotion.

These findings support recent arguments for the need to move beyond viewing specific emotion regulation strategies as either maladaptive or adaptive (Joormann & D'Avanzato, in preparation; Joormann, Yoon & Siemer, in press). It is particularly interesting that individuals who tended to use more reappraisal seemed to have more confidence that a variety of strategies, including suppression and reappraisal, would be effective for them. Thus, it is possible that strategies thought to be less adaptive, such as suppression and rumination, are maladaptive only when they are used inflexibly or in certain types of situations. The results of Loewenstein's (2007) study demonstrated that participants differed in the types of strategies they preferred across different types of scenarios. It is also possible that cognitive variables, such as cognitive flexibility, cognitive control and attention biases, as well as other individual differences, may influence a person's use of strategies and ability to use a variety of different strategies effectively (e.g. Liverant et al., 2008; Bonanno et al., 2004).

In sum, we found support for our hypothesis that predictions about future use of emotion regulation strategies in response to scenarios is correlated with habitual use of strategies in daily life. However, whereas we expected that use of maladaptive strategies

in daily life would correspond with predictions of increased use and effectiveness of only maladaptive strategies, this was not the case. These findings mirrored our results on the relation among depressive symptoms and the use and effectiveness of strategies.

Participants who tended to use rumination in daily life also tended to forecast greater use of rumination; at the same time, they predicted that suppression would be less effective.

In addition, individuals who used reappraisal more frequently in daily life tended to predict that a wider range of emotion regulation strategies would be effective for them.

Once again, difficulties inhibiting negative emotional material and difficulties with cognitive flexibility may underlie these results. If individuals believe that they will have difficulty using strategies, this may lead them have less flexibility in the range of strategies they may draw from and may lead them to use more rumination.

#### *Limitations and Future Directions*

The design utilized in this study offered many advantages. First, the use of an experimental manipulation allowed us to examine causal effects of rumination and reappraisal on subsequent forecasts, and to be able to conclude that any effects were not merely due to differences in mood between conditions. Secondly, this study is among the first to examine affective forecasting in the context of depressive symptoms, which has the potential to contribute to theories of depression. In addition, this study was novel in its examination of individuals' beliefs about use and effectiveness of emotion regulation, particularly due to the fact that we assessed both future-oriented predictions about the use and effectiveness of strategies and self-reports of habitual use of strategies within the same study. To date, most studies have compared only one to two strategies at a time.

Nonetheless, several limitations should be noted. First, this study relied heavily on self-reports of predicted emotional responses, appraisals, and the use and effectiveness of emotion regulation strategies. Given the scarcity of research on affective forecasting in the clinical literature, this measure was developed specifically for this study and pilot tested but should be validated in other research and with other participant groups. In addition, we decided to use hypothetical scenarios to assess affective forecasting and predictions about strategies. Given the use of these scenarios we are unable to address questions about the accuracy of participants' forecasts in relation to their actual experience of emotions and use of emotion regulation strategies. This is due to the fact that we only assessed participants' predictions about how they would respond in scenarios without placing them in these scenarios in order to make comparisons with their actual emotional responses. In previous studies of affective forecasting conducted in the general population, between-subjects designs were often used in which one group of participants made forecasts about an event, such as their reaction to the outcome of a football game or unexpectedly receiving a card with a coin on it. These forecasts were then compared to actual emotional responses measured in a second group of "experiencers", who encountered the event (e.g. Wilson et al., 2000; Wilson et al., 2005).

The use of hypothetical scenarios, however, provided the advantage of studying events involving themes, including loss and rejection, which we felt would have greater relevance to individuals with depression compared to events used in previous affective forecasting studies. In addition, since all participants evaluated the same set of scenarios, this enabled us to standardize stimuli across participants, which would be a challenge in

other designs, such as experience sampling methods. Moreover, it has been suggested that affective forecasts, regardless of their accuracy, have an important impact on decision-making and current affect (Buehler et al., 2007) and may therefore play an important role in increasing risk for emotional disorders. Still, it would be beneficial in future studies to develop novel ways of assessing affective forecasting, for instance through the use of experience sampling methods which incorporate stressors that participants encounter in daily life, such as examinations or break-ups. Similarly, there is a need to incorporate other measures of affective forecasting and emotion regulation beyond self-report measures, including physiological indicators. For example, it would be interesting to compare the physiological responses to imagining future emotional scenarios of depressed individuals to controls, and to explore in a laboratory setting how this is influenced by different emotion regulation techniques. Another interesting question would be whether intentionally manipulating characteristics, such as the intensity and duration, of participants' forecasts in a laboratory setting would have an effect on their mood, or on their motivation to pursue rewards.

Another important limitation of this study, which is relevant only to the analyses examining correlations between depressive symptoms and the dependent variables and the interaction between the emotion regulation task and depressive symptoms, was the use of a student sample with elevated BDI scores analog to a clinically depressed sample. As a result, there was less variability in BDI scores of participants, and it is also possible that there was less variability in forecasts, appraisals, and predictions about emotion regulation strategies. Future studies using diagnosed samples are needed in order to

determine if the results generalize to individuals with clinically significant levels of depression. Related to this concern is the issue of variability in the intensity of the emotions evoked by the scenarios. Many of the scenarios used in the current study pertained to life events, such as loss of a promotion and winning a surprise trip, which elicited predictions of strong emotional responses from most participants. It would be very interesting to examine whether greater differences in BDI score and emotion regulation task condition are seen using scenarios which elicit less intense responses, such as scenarios about minor daily hassles or about pleasurable daily activities.

In addition, a limitation of this study involved the inability to address our questions about forecasts of the duration of emotional responses of scenarios. Participants appeared to have difficulty understanding the instructions of the duration item, leading to a wide range of responses that were difficult to interpret. In a future study, alternative ways of assessing for predictions of duration of emotional responses to scenarios should be explored.

Finally, there are many challenges involved in inducing the use of specific types of emotion regulation strategies. The current study used a brief manipulation consisting of subtle statements, which guided participants to either reappraise or ruminate about a sad event. Because neutral statements were used, this task had the advantage of not influencing participants' mood, allowing us to draw the conclusion that any changes in our dependent variables were due to the emotion regulation task and not merely to differences in mood across conditions. Further, this task was modeled after rumination and distraction response manipulation tasks, which have been effective in numerous

studies on the effects of rumination (see review by Nolen-Hoeksema et al., 2008). The reappraisal manipulation, however, has not been used as extensively in prior studies as the rumination and distraction tasks. It is a common problem in studies differentiating between different types of strategies that it is difficult to ensure whether participants were actually engaging in the type of emotion regulation strategy they are being guided to use. It is possible that these limitations influenced our non-significant results in the analyses of the effects of the emotion regulation manipulation. Future studies should address these concerns by incorporating physiological measures and implicit indices of emotion regulation in addition to self-report methods. Such designs would also allow the possibility to provide more extensive training in different strategies across conditions, in order to better examine the impact of these strategies on affective forecasts.

### *Summary*

This study expanded upon previous studies of affective forecasts and emotion regulation in two important ways. First, we extended existing studies of affective forecasts, which have not yet examined individuals with symptoms of psychopathology, by attempting to understand how symptoms of depression may be related to affective forecasting. Secondly, we explored the association between emotion regulation, which in past research has focused mostly on current or past affect, and affective forecasting. In particular, we examined whether different emotion regulation techniques (reappraisal and rumination) would have a different impact on participants' affective forecasts. We also examined how participants differed in their predictions about which types of strategies they would use if presented with the scenarios, and which strategies would be effective.

Results of this study provide a valuable contribution to theories of affective forecasting and of emotion regulation in depression. The hypothesis that depressive symptoms and affective forecasts would be associated was supported by our results. However, whereas we expected to find that participants with greater levels of depression would predict stronger negative emotional responses to negative scenarios and less pronounced positive responses to positive scenarios, this was not the case. Instead, higher levels of depressive symptoms were associated with a tendency to expect stronger negative emotional reactions to positive events. If individuals with higher levels of depression predict emotional responses to positive scenarios that are contaminated with negative emotions, such as anger and sadness, this is likely to impact their current mood and decision-making. It is likely that people who expect to experience greater negative emotion in response to positive events might feel less motivated to seek out these events. In addition, this may influence their current mood state in that they may feel more hopeless or less optimistic toward the future.

In addition, this study confirmed that symptoms of depression are associated with more negative predictions about appraisals in response to future scenarios. Participants with greater symptoms of depression had a greater tendency to expect that they would be responsible for negative scenarios, and that negative scenarios would have an impact on their lives. This result, which is consistent with previous studies showing a pessimistic attributional style in depression, is interesting because it suggests that the negative pattern of appraising events seen in depression also extends to predictions about the future. The finding that depressed individuals have a negative explanatory style in predicting future

events may further our understanding of the development of hopelessness in depression. Given that hopelessness is directed toward the future, it is possible that future-directed appraisals are even more salient to understanding hopelessness and anhedonia in depression than attributions of events occurring in the present or past.

Results of this study generally did not support our hypothesis that rumination would lead to more negative affective forecasts and appraisals, as well as a greater tendency to prefer maladaptive emotion regulation strategies. Further, with two exceptions, we did not find that the impact of rumination versus reappraisal was more pronounced among individuals with greater levels of depressive symptoms. This may be related to limitations in the study design, which should be addressed in future studies using diagnosed samples and incorporating novel ways of assessing affective forecasting and emotion regulation.

Finally, results of this study provided many insights into the role of predictions about emotion regulation strategies in depression, and the relation among individuals' predictions about emotion regulation strategies and their use of these strategies in daily life. Symptoms of depression were associated with predictions about emotion regulation, as we expected. However, results of this study helped to challenge previous ways of categorizing emotion regulation strategies into purely adaptive versus maladaptive categories. Specifically, as we expected, individuals higher in depressive symptoms tended to be more likely to expect that they would use rumination to cope with negative situations. However, whereas we had expected that depressive symptoms would be associated with a greater tendency to use maladaptive strategies only, this was not the

case. Depressive symptoms appeared to be associated with a decreased tendency to expect that suppression, a less adaptive strategy, and distraction, a more adaptive strategy, would be effective. This suggests that there may be an overall tendency for individuals experiencing greater symptoms of depression to expect that emotion regulations in general will be less effective for them.

A similar pattern was found in results of analyses on the relation between habitual use of emotion regulation strategies, indicated by the RSQ and ERQ, and predictions participants made about emotion regulation strategies they would use to cope with negative scenarios. We found that habitual use of emotion regulation strategies was related to predictions about the use of these strategies in response to future scenarios in important ways. However, greater day to day use of maladaptive strategies, such as rumination and reappraisal, did not always correspond with higher ratings of predicted effectiveness of only maladaptive strategies. For instance, participants with higher RSQ scores, while more likely to expect using rumination if faced with negative scenarios, were actually less likely to expect that suppression would be effective for them. Similarly, higher ERQ Reappraisal scores were related to higher expectations that both reappraisal and, unexpectedly, suppression would be effective.

The current study provided several insights into the relationship between depressive symptoms and affective forecasting, which should be examined in future studies using diagnosed samples. Results also helped to address questions, which had not previously been explored, about how depressive symptoms relate to predictions about emotion regulation strategies, as well as to the habitual use of emotion regulation

strategies in daily life. Future studies are needed, which seek to further understand the association among different types of emotion regulation strategies among individuals with depression. It will be important for future studies to build upon our findings by exploring potential mechanisms, such as cognitive correlates, underlying how effectively individuals with depression are able to use a variety of different strategies.

## References

- Abramson, L. Y., Metalsky, G. I., & Alloy, L. B. (1989). Hopelessness depression: A theory-based subtype of depression. *Psychological Review*, *96*, 358–372.
- Alloy, L.B., Abramson, L.Y., Whitehouse, W.G., Hogan, M.E., Panzarella, C., Rose, D.T. (2006). Prospective incidence of first onsets and recurrences of depression in individuals at high and low cognitive risk for depression. *Journal of Abnormal Psychology*, *115*, 145–156.
- Beck, A.T. (1987). Cognitive models of depression. *Journal of Cognitive Psychotherapy: An International Quarterly*, *1*, 5–37.
- Beck, A. T., & Steer, R. A. (1993). *Beck Depression Inventory–Manual*. San Antonio: Psychological Corp.
- Beck, A. T., Steer, R.A., & Garbin, M. G. (1988) Psychometric properties of the Beck Depression Inventory: Twenty-five years of evaluation. *Clinical Psychology Review* *8 (1)*, 77-100.
- Bonanno, G., Papa, A., O’Neill, K., Westphal, M. & Coifman, K. (2004). The importance of being flexible: The ability to both enhance and suppress emotional expression predicts long-term adjustment. *Psychological Science*, *15*, 482-487.
- Buehler, R., McFarland, C., Spyropoulos, V., & Lam, K.C.H. (2007). Motivated prediction of future feelings: effects of negative mood and mood orientation on affective forecasts. *Personality and Social Psychology Bulletin*, *33*, 1265-1278.
- Butler, E., Wilhelm, F., Smith, N.C., Erickson, E.A., Gross, J.J. & Egloff, B. (2003). The social consequences of expressive suppression. *Emotion*, *3*, 48-67.
- Donaldson, C. & Lam, D. (2004). Rumination, mood, and social problem-solving in major depression. *Psychological Medicine*, *34*, 1309-1318.
- Foa, E. B., Riggs, Dancu, C. V. S., & Rothbaum B. O. (1993). Reliability and validity of a brief instrument for assessing Post Traumatic Stress Disorder. *Journal of Traumatic Stress*. *6 (4)*, 459-473.
- Fresco, D., M., Alloy, L.B., & Reilly-Harrington, N. (2006). Association of attributional style for negative and positive events and the occurrence of life events with depression and anxiety. *Journal of Social and Clinical Psychology*, *25*, 1140-1159.

- Gilbert, D.T., Pinel, E.C., Wilson, T.D., Blumberg, S.J. & Wheatley, T.P. (1998). Immune neglect: a source of durability bias in affective forecasting. *Journal of Personality and Social Psychology*, 75, 617-638.
- Gross, J. J. (1998). Antecedent- and response-focused emotion regulation: Divergent consequences for experience, expression, and physiology. *Journal of Personality and Social Psychology*, 74, 224-237.
- Gross, J.J. & John, O.P. (2003). Individual differences in two emotion regulation processes: implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology*, 85, 348-362.
- Gross, J.J. & Thompson, R.A. (2007). Emotion regulation: conceptual foundations. In J.J. Gross (Ed.) *Handbook of Emotion Regulation* (pp. 180-203). New York: Guilford Press.
- Haefffel, G. J., Abramson, L. Y., Voelz, Z. R., Metalsky, G. I., Halberstadt, L., Dykman, B. M., et al. (2005). Negative cognitive styles, dysfunctional attitudes, and the remitted depression paradigm: A search for the elusive cognitive vulnerability to depression factor among remitted depressives. *Emotion*, 5, 343-348.
- Haefffel, G.J., Abramson, L.Y., Brazy, P.C. & Shah, J.Y. (2008). Hopelessness theory and the approach system: Cognitive vulnerability predicts decreases in goal-directed behavior. *Cognitive Therapy Research*, 32, 281-290.
- Hankin, B., Abramson, L.Y. & Siler, M. (2001). A prospective test of the hopelessness theory of depression in adolescence. *Cognitive Therapy and Research*, 25, 607-632.
- Ingram, R.E. (1984). Toward an information-processing analysis of depression. *Cognitive Therapy and Research*, 8, 443-477.
- John, O.P. & Gross, J.J. (2004). Healthy and unhealthy emotion regulation: personality processes, individual differences, and life span development. *Journal of Personality*, 72, 1301-1334.
- Joormann, J. (2004). Attentional bias in dysphoria: The role of inhibitory processes. *Cognition and Emotion* 18, 125-147.
- Joormann, J. (2008). Cognitive aspects of depression. In I.H.Gotlib & C.L. Hammen (Eds) *Handbook of Depression and Its Treatment* (pp.298-321) New York, NY: Guilford Press.

- Joormann, J. & D'Avanzato, C. (in preparation). Emotion regulation in depression: Examining the role of cognition. *Cognition and Emotion*.
- Joormann, J., & Gotlib, I. H. (2006). Is this happiness I see? Biases in the identification of emotional facial expressions in depression and social phobia. *Journal of Abnormal Psychology, 115*, 705-714.
- Joormann, J. & Siemer, M. (2004). Memory accessibility, mood regulation, and dysphoria: difficulties in repairing sad mood with happy memories?. *Journal of Abnormal Psychology, 113*, 179-188.
- Joormann, J., Yoon, K. L., & Siemer, M. (in press). Cognition, attention and emotion regulation. To appear in A. Kring & D. Sloan (Eds.), *Emotion Regulation and Psychopathology*. NY, New York: Guilford Press.
- Keller, M.B. & Boland, R.J. (1998). Implications of failing to achieve successful long-term maintenance treatment of recurrent unipolar major depression, *Biological Psychiatry, 44*, 348-360.
- Kessler, R.C., Berglund, P., Demler, O., Jin, R., Koretz, D., Merikangas, K.R., Rush, A.J., Walters, E.E. & Wang, P.S. (2003). The epidemiology of major depressive disorder: results from the National Comorbidity Survey Replication (NCS-R). *The Journal of the American Medical Association, 289*, 3095-3105.
- Lerner, J. S., & Gonzalez, R. M. (2005). Forecasting one's future based on fleeting subjective experiences. *Personality and Social Psychology Bulletin, 31*, 454-466.
- Liverant, G.I., Brown, T.A., Barlow, D.H. & Roemer, L. (2008). Emotion regulation in unipolar depression: The effects of acceptance and suppression of emotional experience intensity and duration of sadness and negative affect. *Behavior Research and Therapy, 46*, 1201-1209.
- Loewenstein, G. (2007). Affect regulation and affective forecasting. In J.J. Gross (Ed.) *Handbook of Emotion Regulation* (pp. 180-203). New York: Guilford Press.
- Lyubormirsky, S. & Nolen-Hoeksema, S. (1993). Self-perpetuating properties of dysphoric rumination. *Journal of Personality and Social Psychology, 65*, 339-349.
- Lyubormirsky, S., Tucker, K.L., Caldwell, N.D., & Berg, K. (1999). Why ruminators are poor problem solvers: clues from the phenomenology of dysphoric rumination. *Journal of Personality and Social Psychology, 77*, 1041-1060.

- Mathews, A., & MacLeod, C. (2005). Cognitive vulnerability to emotional disorders. *Annual Review of Clinical Psychology*, 1, 167-195.
- McCrae, R. R. & Costa, P. T. (1987). Validation of the five-factor model of personality across instruments and observers. *Journal of Personality & Social Psychology*, 52, 81-90.
- Metalsky, G. I., & Joiner, T. E., Jr. (1992). Vulnerability to depressive symptomatology: A prospective test of the diathesis–stress and causal mediation components of the hopelessness theory of depression. *Journal of Personality and Social Psychology*, 63, 667–675.
- Monroe, S.M., Slavich, G.M., Torres, L.D., & Gotlib, I.H. (2007). Severe life events predict specific patterns of change in cognitive biases in major depression. *Psychological Medicine*, 37, 863-871.
- Murray, C.J.L. & Lopez, A.D. (1997). Global mortality, disability, and the contribution of risk factors: The Global Burden of Disease Study. *The Lancet*, 349, 1336-1342.
- Nolen-Hoeksema, S. (1991). Responses to depression and their effects on the duration of depressive episodes. *Journal of Abnormal Psychology*, 100, 569–582.
- Nolen-Hoeksema, S. & Davis, C.G. (1999). “Thanks for sharing that”: Ruminators and their social support networks. *Journal of Personality and Social Psychology*, 77, 801-814.
- Nolen-Hoeksema, S., & Morrow, J. (1991). A prospective study of depression and posttraumatic stress symptoms after a natural disaster: The 1989 Loma Prieta earthquake. *Journal of Personality and Social Psychology*, 61, 115-121.
- Nolen-Hoeksema, S., Parker, L. E. & Larson, J. (1994). Ruminative coping with depressed mood following loss. *Journal of Personality and Social Psychology* 67, 92-104.
- Nolen-Hoeksema, S., Wisco, B.E., & Lyubormirsky, S. (2008). Rethinking rumination. *Perspectives on Psychological Science*. 3, 400-424.
- Pyszczynski, T., Holt, K., & Greenberg, J. (1987). Depression, self-focused attention, and expectancies for positive and negative future life events for self and others. *Journal of Personality and Social Psychology*, 52, 994–1001.
- Radloff, L.S. (1977). The CES-D Scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, 1, 385-401.

- Richards, J. M., & Gross, J. J. (2000). Emotion regulation and memory: The cognitive costs of keeping one's cool. *Journal of Personality and Social Psychology*, 79, 410–424.
- Richards, J.M., Butler, E. & Gross, J.J. (2003). Emotion regulation in romantic relationships: The cognitive consequences of concealing feelings. *Journal of Personal and Social Relationships*, 3, 599-620.
- Roberts, J.E., Gilboa, E., & Gotlib, I.H. (1998). Ruminative response style and vulnerability to episodes of dysphoria: Gender, neuroticism, and episode duration. *Cognitive Therapy and Research*, 22, 401–423.
- Siemer, M. (2001). Mood-specific effects on appraisal and emotion judgments. *Cognition and Emotion*, 15, 453-485.
- Siemer, M. (2005). Mood-congruent cognitions constitute mood experience. *Emotion*, 5, 296-308.
- Spielberger, C.D., Gorsuch, R., Lushene, R., Vagg, P.R., & Jacobs. G.A. (1983) STAI manual for the state-trait anxiety inventory, Consulting Psychologists Press, Palo Alto, CA (1983).
- Sutherland, K., & Bryant, R. A. (2007). Rumination and overgeneral autobiographical memory. *Behaviour Research and Therapy*, 45, 2407-2416.
- Tamir, M., Robinson, M. D., & Clore, G. L. (2002). The epistemic benefits of trait-consistent mood states: An analysis of extraversion and mood. *Journal of Personality and Social Psychology*, 83(3), 663-677.
- Williams, J. M. G., Barnhofer, T., Crane, C., Hermans, D., Raes, F., Watkins, E., & Dalgleish, T. (2007). Autobiographical memory specificity and emotional disorder. *Psychological Bulletin*, 133, 122-148.
- Wilson, T.D., Centerbar, D.B., Kermer, D.A., & Gilbert, D.T. (2005). The pleasures of uncertainty: Prolonging positive moods in ways people do not anticipate. *Journal of Personality and Social Psychology*, 88, 5-21.
- Wilson, T.D. & Gilbert, D.T. (2003). Affective forecasting. In M.P.Zanna (Ed.) *Advances in Experimental Social Psychology*, 35 (pp 345-411). San Diego: Elsevier.

Wilson, T.D., Wheatley, T., Meyers, J.M., Gilbert, D.T., & Axsom, D. (2000).  
Focalism: a source of the durability bias in affective forecasting. *Journal of  
Personality and Social Psychology*, 78, 821-836.

## Appendices

### Appendix A: Scenarios

#### 1. **Spurned by an old friend** (Sadness)

He/she had been your best friend for years. You were surprised how easy it was to talk to him/her when you first met. You could talk about anything, even very personal things. Your friend always seemed to be there for you when you needed a hand- even when it was something no one else wanted to do, like pick you up from the airport in the middle of the night, cheer you up or help you move into your new place.

But now you never see him/her. When you call, he/she always seems to be running out or in the middle of something. When he/she does call, it seems to always be just in the middle of a busy week at work and he/she can't talk long. The only way you manage to get updates about your friend's life are through common friends. You found out your friend broke up with his/her partner from a friend of the partner. You thought you were his/her closest friend and that you should be there to talk to him/her about this stuff. You ask him/her if something is wrong, but he/she brushes you off.

#### 2. **An important failure at work** (Sadness)

You had been so excited to get this opportunity for promotion. You have been working in an under-appreciated entry-level position for years now, just waiting for your chance to move up. This position was your big chance to make a name for yourself in the company, opening the door for you to realize your dream of someday obtaining a leadership position or at the very least the references and connections you need to get a better job in another company.

Now that chance is over. At your annual evaluation, you become confused as you notice your boss's facial expression as he prepares to speak. He tells you that he regrets to inform you that you were not chosen for the position. To make matters worse you learn that the position was given to a junior employee who has not been with the company nearly as long as you. You try to get advice from your supervisor on how you could improve. He responds that it is a competitive field and only the very top employees realistically have a chance. You glance through the pages of your evaluation at several of the criticisms.

#### 3. **Breakup** (Sadness)

You and \_\_\_\_\_ have been together for awhile now. You remember the first time you were introduced. You can't pinpoint exactly what it is, but you remember being immediately drawn to him/her. It probably had something to do with how funny, well-liked, and attractive he/she is. This is someone you can see yourself staying with in the long-run. You still look forward to seeing him/her and know you can count on this person during hard times.

Lately, your partner has not been acting like usual, but instead has seemed distant and colder than the person you're used to. As you're finishing dinner, you're told that

there is something you both need to talk about. Your partner tells you he/she feels your relationship has reached a dead end and he/she wants to see other people again. You fumble for the right words to say.

**4. Accident (Anxiety)**

It figures. The one day that you're running late to work and have a big presentation, you get caught in terrible traffic. You seem to hit every red light along the way. With each minute sitting in your car, your pulse quickens a little and you continually check the clock. You scold yourself for not leaving the house earlier because you were so stubborn about making sure every last detail for your big presentation was just right. You try to reach your boss on the phone but realize it's too late, she's left her office to go to the meeting room already. At the next intersection you reach, you watch the light turn green and let out a groan as you notice that, not one, but two cars have blocked the intersection where you need to turn, and you have to wait for the next green light. You are now officially 10 minutes late and still not nearly there. The light finally turns green, and you continue to crawl along. You hear that familiar tone and glance down at your cell phone, noticing you have a text message from your boss. In what seems like a split second, you begin to lift your head back toward the road and SMACK-you've hit the car in front of you.

**5. Lost Game, Lost Chance (Sadness)**

It is the last five minutes of the biggest soccer game of the season, and the other team is ahead by one goal. Completely exhausted, you can feel the sun beating down on you and hear the cheers of your coach, teammates and family members in the stands. The pressure is on this time even more than usual, because your family has finally come to watch you play, and you're vying for a substantial cash prize that you hope to use toward taking them on a vacation next year. It seems like everything is riding on this one game.

As your teammate wrestles the ball from his opponent, the two of you take off down the field, somehow managing to evade the defense with your passes. He passes to you, and realizing that it's your chance, you shoot the ball toward the corner of the goal with all of your might. You hear a clunk as the ball hits the post and is sent out of bounds followed by a muffled groan of disappointment from the stands. In somewhat of a blur, you notice the goal kick followed by an opponent coasting with the ball down the field away from you. In what seems like a matter of seconds, he has scored, shattering all hope of a win.

**6. Trouble with Coworkers (Sadness)**

It's a month into your new job, and you're still trying to make friends and get your bearings in your new city. You moved from halfway across the country and started the job not knowing a single person. Fortunately, you've been going through the process with three other coworkers who also relocated for the job, and so far you think you've

been getting along ok with them. In the first couple weeks of work the three of you were pretty close, eating lunch together every day and even spending time together on the weekends.

Lately you have to admit that things have been pretty lonely compared with what you were used to back home. You're trying hard to find your niche and make friends, but you don't quite feel a good fit with some of the other people at work and in your community yet. More and more, it seems that the other new people have been breaking off into separate cliques, despite your efforts to fit in. One of your coworkers is never around outside work, and you start to notice that the other two are getting closer and including you in their plans a lot less. Just last Friday, they went to a game without mentioning it to you and you stayed in and watched a movie alone. One day as you're walking down the hall, you overhear the two of them from another office, talking and laughing. You overhear them talking about how strange it is that you seem to always be by yourself at lunch and are always working late in your office, wondering aloud if you have any close friends.

#### 7. **Inconsiderate Neighbor** (Anger)

You jump up out of bed, startled from your sleep by the sounds of screaming. You look out your window over toward the house of your neighbors. A party is going on, like usual. It's 2 AM, and you have to get up for work in another 4 hours. You amble over to their house. After ringing the bell for the 4<sup>th</sup> time, your neighbor finally comes to the door. You try to politely ask him if he could keep it down because you're having trouble sleeping and need to work tomorrow morning. He rolls his eyes and reluctantly nods his head. You usually have to do this every week. And that is only because the other times they're making a lot of noise, you find it is less of a hassle to just use your earplugs. But, right now, even the earplugs won't keep out the noise, and you need to rest for a big day at work tomorrow.

Three months ago when they moved in, it wasn't an issue. You figured they just didn't realize how thick the walls of the houses were and that the problem would go away once you pointed it out. But after the 5<sup>th</sup> time of being kept awake by the pounding bass and the loud voices, you began to realize the problem you had on your hands.

Sighing, you get back into bed and try to distract yourself, and after about 30 minutes you are finally back asleep. Another 25 minutes later, and you are awoken by the sound of loud music coming from next door once again. Except this time, it's woken your baby up too.

#### 8. **A Job Well Done** (Happiness)

It was the big day of your marketing campaign pitch. Months ago, your team at work had begun preparing your presentation for this day. Now, you were all sitting around a long oval table in a meeting room as your potential clients meet to discuss your marketing campaign in another room.

You and your team had awoken this morning early with anxious excitement. You have been preparing for the past 6 months to put together the best presentation. Over the past 6 months, things really began to click, and your team developed some innovative advertisements for the company's product. By yesterday, your run-throughs had become almost flawless.

You feel that your team pulled off an excellent presentation this morning. However, the faces of your potential clients were difficult to read.

So, now you and your team are sitting around the table in anticipation of the decision. However, you have a realistic idea of your chances of sealing the deal. Still, you want the contract very badly. If you were selected for the job, many good things would come from it.

As your potential clients slowly file back into the room, your teammates look up hopefully. They begin to shake your hand. You have been awarded the contract!

### **9. Something Unexpected (Happiness)**

As you slowly get up out of bed, you grumble as you realize today is Monday, and yet another stressful week at work awaits you until the weekend. Lately, you have been completely swamped at your job. Endless stacks of paperwork, complaints from customers, deadlines, pointless meetings- not to mention an unappreciative boss- you wonder how you'll make it through another week, let alone the rest of the year. To make matters worse, you found out about some unexpected expenses you and your family will have to cover somehow. So, the road trip you were planning on taking your family on is now out of the question.

While you're sifting through your email, you're perplexed when you come across an email with the subject, "Congratulations!" As you're about to send it to your junk mail folder, figuring it's just another scam, you decide to open it- just to put off that stack of paperwork for another minute. You soon see that it's actually a memo sent out to everyone at your work announcing the end of the year awards. Next to "employee of the year", you see your name written. You've just won tickets to go on a trip!

### **10. Birthday (Happiness)**

It's 9 o'clock on a Friday night, and you're just leaving work. You've been working such long hours lately that you haven't even been able to think about making plans to celebrate your birthday- and it's already tomorrow! You begin to think about how many events you've had to pass up on with friends lately. You realize that you haven't heard from any of them yet about plans for your birthday. As you enter your building and open your mailbox, you find only junk mail- no cards or packages. You begin to wonder if they may have forgotten. As you're finishing dinner and sitting down to watch TV, you get a call from one of your friends asking if you want to grab dinner tomorrow night. He makes no mention of your birthday, but you accept the invitation, happy at the very least to have some plans to go out on your birthday.

You meet your friend inside the restaurant, and the hostess begins to lead the two of you to your table towards the back of the restaurant. As she turns around the corner,

you suddenly hear, “SURPRISE!” and notice a group of your friends sitting at a table around a cake and some presents. One of your friends hands you a glass of champagne and begins a toast.

### **11. Speech (Anxiety)**

You hear the phone ring, and it’s your best friend. Your friend begins apologizing about a huge favor he/she has to ask you. He/she has been running a campaign for a position in the local government. Your friend is calling to ask you to give a speech in support of him/her at a campaign event that was organized at the very last minute, and you have only a couple days to prepare. Right now, the race is very close. You both know that it could go either way, yet your friend really wants this position.

As you get to the microphone, you look out over the guests. You begin to speak, knowing in the back of your mind how you rushed to throw the speech together. While you speak, all you seem to notice are blank stares. One of your jokes seem to fall flat. You steal a glance toward your friend to gauge how you are doing, but you can’t tell what he/she is thinking by his/her expressionless face.

### **12. Computer Trouble (Anger)**

It is one of the busiest weeks of work of the year, and you are up late at night at your computer working. All of a sudden, a blue warning message appears on the screen, and your computer shuts down. There is a serious problem with your computer.

You call the technical support number and are put on hold for half an hour. A representative then answers and spends 20 minutes asking you questions about what the problem is. She then tells you she realized you reached the wrong department and goes to transfer you. Suddenly, you hear a click and then a dial tone. You call again and are put on hold for another 25 minutes before reaching someone. After explaining the problem and being transferred three more times, you finally reach the correct department. This time, the representative rudely questions your account of the problem and accuses you of dropping the computer. After arguing for another 15 minutes and speaking with his supervisor, the supervisor promises she will look into the issue and contact you before the end of the day. Yet, the day passes and you receive no call. When you call back again, you reach a different person who states there is no record of your call. A week passes, and the issue has still not been resolved. By the time you finally reach someone who can arrange to get your computer repaired, she tells you that your warranty recently expired and that you will need to pay for the repairs.

### **13. Taxes (Happiness)**

It’s a week before your tax return is due, and you haven’t even begun. You’ve been putting it off, anticipating that you will owe the government a substantial amount this year and not knowing how you will come up with the extra money this month. As you collect all of the receipts, bank statements, and forms you will need to do your taxes,

you think about how it has been several months since you've had the extra money to treat yourself to something.

After entering all of your information into the computer, you wait for the program to calculate what you will owe. When the result appears on the screen, you think a mistake must have been made as the computer indicates that you do not owe any money this year. After double-checking your forms, you realize that it is no mistake- you over-paid this year and will be getting a refund of \$500. That means \$500 more in your pocket than you had expected. You decide to take the money and go on a shopping trip, buying something you had been badly wanting for a long time.

#### **14. Change in Plans (Sadness)**

You have been looking forward to this vacation with your partner since you booked the tickets. It's been awhile since you've taken a vacation like this, as you've been slowly saving the money and vacation days at work. Just yesterday the two of you went shopping for new clothes, books and magazines to take with you on the trip. You've also been eagerly reading through guidebooks to get ideas of all the fun things you want to do, places you want to see, and restaurants you want to try while you're there.

A week before you're set to leave, you decide to get together for a bike ride with a close friend, knowing that you won't be seeing him/her for awhile. You're riding along the bike path at a fast pace, when suddenly a jogger, not seeing you come up behind her, slows down and comes to a stop in front of you. Trying not to hit her, you swerve and lose your balance. Before you can react, you hit the ground hard and are overcome by sharp, intense pain. The doctor later confirms that you have a bad break, telling you that you won't be able to walk while it heals and ordering bed rest. You will not be able to go on your trip.



10. Does this event influence how you view yourself?

1	2	3	4	5	6	7	8	9
View				View				View
myself				myself				myself
more				the same				more
negatively								positively

11. Was this event expected?

1	2	3	4	5	6	7	8	9
Completely				Somewhat				Completely
Unexpected				Expected				Expected

12. Imagine that you are in this situation, there is nothing you can do to change this situation right now but you want to feel better.

Which of the following strategies do you think would work best in this situation to help you feel better? Press the number on the keyboard that corresponds with your response.

1. Think about the situation from a different perspective
2. Reason about why the objective situation isn't so bad
3. Distract myself with other things; try not to think about the situation
4. Will myself to be "cool, calm, and collected"
5. Try to think about the reasons why the situation was happening

---

Instructions for Questions 13-17:

*Now, we will present you with some strategies you might use to maintain the intensity of the positive feeling. You will be presented with one type of strategy at a time. For each strategy, we would like you to rate:*

*1) How likely it is that you would use the strategy*

*AND*

*2) How well you think it would work*

*Please type the number that best describes how you feel about the strategy that is presented.*

---

13. **Think about the situation from a different perspective.**

1. In this situation, would you use this strategy?

1	2	3	4	5	6	7	8	9	10
Definitely not				Maybe					Definitely yes





6. How long do you think this feeling would last? Please type your response below. If it is less than an hour type 005 for 5 minutes and 010 for 10 minutes etc., type 1 if it is an hour and if it is over an hour type the number of hours (e.g. type 10 for 10 hours and 24 for a day etc.).
7. If you were in the situation, how much would this impact your life?
- |            |   |   |   |          |   |   |           |   |
|------------|---|---|---|----------|---|---|-----------|---|
| 1          | 2 | 3 | 4 | 5        | 6 | 7 | 8         | 9 |
| Not at all |   |   |   | Moderate |   |   | Extremely |   |
8. To what extent do you think that you are responsible for this event occurring?
- |            |   |   |   |          |   |   |            |   |
|------------|---|---|---|----------|---|---|------------|---|
| 1          | 2 | 3 | 4 | 5        | 6 | 7 | 8          | 9 |
| Not at all |   |   |   | Somewhat |   |   | Completely |   |
9. Does this event influence how you view yourself?
- |                             |   |   |   |                      |   |   |                             |   |
|-----------------------------|---|---|---|----------------------|---|---|-----------------------------|---|
| 1                           | 2 | 3 | 4 | 5                    | 6 | 7 | 8                           | 9 |
| View myself more negatively |   |   |   | View myself the same |   |   | View myself more positively |   |
10. Was this event expected?
- |                       |   |   |   |                   |   |   |                     |   |
|-----------------------|---|---|---|-------------------|---|---|---------------------|---|
| 1                     | 2 | 3 | 4 | 5                 | 6 | 7 | 8                   | 9 |
| Completely Unexpected |   |   |   | Somewhat Expected |   |   | Completely Expected |   |
11. Suppose you were in this scenario and you wanted to enjoy the positive feeling as intensely and long as you possibly could. Which of the following strategies do you think would work best to prolong the positive feeling? Press the number on the keyboard that corresponds with your response.
1. Concentrate and savor the moment
  2. Think about the situation from a positive perspective
  3. Just enjoy; don't try anything

---

Instructions for Questions 12-14:

*Now, we will present you with some strategies you might use to maintain the intensity of the positive feeling. You will be presented with one type of strategy at a time. For each strategy, we would like you to rate:*

*1) How likely it is that you would use the strategy*

*AND*

*2) How well you think it would work*



## Appendix C: Rumination and Reappraisal Manipulation Cues

### **Rumination Cues**

1. The level of motivation you feel right now
2. How you feel about your friendships
3. How hopeful/hopeless you are feeling
4. How sad/happy you are
5. Understanding your feelings
6. The kind of person you think you should be
7. What people notice about your personality
8. Why you react the way you do

### **Reappraisal Cues**

1. Things you can do to make yourself feel better
2. Ways you can distract yourself from your feelings
3. Other ways this event could have been interpreted
4. Ways in which you could have reacted differently
5. What advice you would give to someone in a similar situation
6. How you will see this situation in 10 years from now
7. Other possible solutions
8. Ways of looking at the situation from another perspective

## Appendix D: Emotion Regulation Questionnaire (ERQ)

In this section, we would like to ask you some questions about your emotional life, in particular, how you control (that is, regulate and manage) your emotions. We are interested in two aspects of your emotional life. One is your emotional experience, or what you feel inside. The other is your emotional expression, or how you show your emotions in the way you talk, gesture or behave. Although some of the following questions may seem similar to one another, they differ in important ways. For each of them, please answer using the following scale:

---

1-----2-----3-----4-----5-----6-----7  
strongly neutral strongly  
disagree agree

---

1. \_\_\_ I tend to control my emotions most of the time.
2. \_\_\_ When I want to feel more *positive* emotion (such as joy or amusement), I *change what I'm thinking about*.
3. \_\_\_ I can keep my emotions to myself.
4. \_\_\_ When I want to feel less *negative* emotion (such as sadness or anger), I *change what I'm thinking about*.
5. \_\_\_ When I am feeling *positive* emotions, I am careful not to express them.
6. \_\_\_ When I'm faced with a stressful situation, I make myself *think about it* in a way that helps me stay calm.
7. \_\_\_ I control my emotions by *not expressing* them.
8. \_\_\_ When I want to feel more *positive* emotion, I *change the way I am thinking about the situation*.
9. \_\_\_ I almost never inhibit my emotional expressions.
10. \_\_\_ I control my emotions by *changing the way I think* about the situation I'm in.
11. \_\_\_ When I am feeling *negative* emotions, I make sure not to express them.
12. \_\_\_ Overall, I have a great deal of control over my emotions.
13. \_\_\_ When I want to control my emotions, I'm not likely to *change the way I think about the situation*.
14. \_\_\_ When I want to feel less *negative* emotion, I *change the way I'm thinking about the situation*.

## Appendix E: Response Styles Questionnaire (RSQ)

People think and do many different things when they feel depressed. Please read each of the following items and indicate whether you never, sometimes, often, or always think or do each one when you feel down, sad, or depressed. Please indicate what you generally do, not what you think you should do.

	Almost Never	Some- times	Often	Almost Always
1. Think about how alone you feel	1	2	3	4
2. Think "I won't be able to do my job/work because I feel so badly."	1	2	3	4
3. Think about your feelings of fatigue and achiness	1	2	3	4
4. Think about how hard it is to concentrate	1	2	3	4
5. Think about how passive and unmotivated you feel	1	2	3	4
6. Analyze recent events to try to understand why you are depressed	1	2	3	4
7. Think about how you don't seem to feel anything anymore	1	2	3	4
8. Think "Why can't I get going?"	1	2	3	4
9. Think "Why do I always react this way?"	1	2	3	4
10. Go away by yourself and think about why you feel this way	1	2	3	4
11. Write down what you are thinking about and analyze it	1	2	3	4
12. Think about a recent situation, wishing it had gone better	1	2	3	4
13. Think "Why do I have problems other people don't have?"	1	2	3	4
14. Think about how sad you feel	1	2	3	4
15. Think about all your shortcomings, failings, faults, mistakes	1	2	3	4
16. Think about how you don't feel up to doing anything	1	2	3	4
17. Analyze your personality to try to understand why you are depressed	1	2	3	4
18. Go someplace alone to think about your feelings	1	2	3	4
19. Think about how angry you are with yourself	1	2	3	4

- |  |   |   |   |   |
|--|---|---|---|---|
| 20. Listen to sad music  | 1 | 2 | 3 | 4 |
| 21. Isolate yourself and think about the reasons why you<br>feel sad     | 1 | 2 | 3 | 4 |
| 22. Try to understand yourself by focusing on your<br>depressed feelings | 1 | 2 | 3 | 4 |
| 23. What am I doing to deserve this?                                     | 1 | 2 | 3 | 4 |
| 24. I won't be able to concentrate if I keep feeling this way.           | 1 | 2 | 3 | 4 |
| 25. Why can't I handle things better?                                    | 1 | 2 | 3 | 4 |

## Appendix F: Beck Depression Inventory (BDI-II)

This questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick out the ONE STATEMENT in each group that best describes the way you have been feeling during the PAST TWO WEEKS, INCLUDING TODAY. Circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for any group, including Item 16 (Changes in sleeping pattern) or Item 18 (Changes in Appetite).

### 1. Sadness

- 0 I do not feel sad.
- 1 I feel sad much of the time.
- 2 I am sad all the time
- 3 I am so sad or unhappy that I can't stand it

### 2. Pessimism

- 0 I am not discouraged about my future.
- 1 I feel more discouraged about my future than I used to be.
- 2 I do not expect things to work out for me.
- 3 I feel that my future is hopeless and will only get worse.

### 3. Past Failure

- 0 I do not feel like a failure.
- 1 I have failed more I should have.
- 2 As I look back, I see a lot of failures.
- 3 I feel I am a total failure as a person.

### 4. Loss of Pleasure

- 0 I get as much pleasure as I ever did from the things I enjoy.
- 1 I don't enjoy things as much as I used to.
- 2 I get very little pleasure from the things I used to enjoy.
- 3 I can't get any pleasure from the things I used to enjoy.

### 5. Guilty Feelings

- 0 I don't feel particularly guilty.
- 1 I feel guilty over many things I have done or should have done.
- 2 I feel quite guilty most of the time.
- 3 I feel guilty all of the time.

### 6. Punishment Feelings

- 0 I don't feel I am being punished.
- 1 I feel I may be punished.
- 2 I expect to be punished.
- 3 I feel I am being punished.

### 7. Self-Dislike

- 0 I feel the same about myself as ever.
- 1 I have lost confidence in myself.
- 2 I am disappointed in myself.
- 3 I dislike myself.

### 8. Self-Criticalness

- 0 I don't criticize or blame myself more than usual.
- 1 I am more critical of myself than I used to be.
- 2 I criticize myself for all of my faults.
- 3 I blame myself for everything bad that happens

### 9. Suicidal Thoughts or Wishes

- 0 I don't have any thoughts of killing myself.
- 1 I have thoughts of killing myself, but I would not carry them out.
- 2 I would like to kill myself.
- 3 I would kill myself if I had chance.

### 10. Crying

- 0 I don't cry any more than I used to.
- 1 I cry more than I used to
- 2 I cry over every little thing.
- 3 I feel like crying, but I can't.

**11. Agitation**

- 0 I am no more restless or wound up than usual.
- 1 I feel more restless or wound up than usual.
- 2 I am so restless or agitated that it's hard to stay still.
- 3 I am so restless or agitated that I have to keep moving or doing something.

**12. Loss of Interest**

- 0 I have not lost interest in other people or activities.
- 1 I am less interested in other people or things than before.
- 2 I have lost most of my interest in other people or things.
- 3 It's hard to get interested in anything.

**13. Indecisiveness**

- 0 I make decisions about as well as ever.
- 1 I find it more difficult to make decisions than usual.
- 2 I have much greater difficulty in making decisions than I used to.
- 3 I have trouble making any decisions.

**14. Worthlessness**

- 0 I don't feel I am worthless.
- 1 I do not consider myself as worthwhile and useful as I used to.
- 2 I feel more worthless as compared to other people.
- 3 I feel utterly worthless.

**15. Loss of Energy**

- 0 I have as much energy as ever.
- 1 I have less energy than I used to have.
- 2 I don't have enough energy to do very much.
- 3 I don't have enough energy to do anything.

**16. Changes in Sleeping Pattern**

- 0 I have not experienced any change in my sleeping pattern.

-----

- 1a I sleep somewhat more than usual.

- 1b I sleep somewhat less than usual.

-----

- 2a I sleep a lot more than usual.

- 2b I sleep a lot less than usual.

-----

- 3a I sleep most of the day.

- 3b I wake up 1-2 hours early and can't get back to sleep.

**17. Irritability**

- 0 I am no more irritable than usual.
- 1 I am more irritable than usual.
- 2 I am much more irritable than usual.
- 3 I am irritable all the time.

**18. Changes in Appetite**

- 0 I have not experienced any change in my appetite.

-----

- 1a My appetite is somewhat less than usual.

- 1b My appetite is somewhat greater than usual.

-----

- 2a My appetite is much less than before.

- 2b My appetite is much greater than usual.

-----

- 3a I have no appetite at all.

- 3b I crave food all the time.

**19. Concentration Difficulty**

- 0 I can concentrate as well as ever.
- 1 I can't concentrate as well as usual.
- 2 It's hard to keep my mind on anything for very long.
- 3 I find I can't concentrate on anything.

**20. Tiredness or Fatigue**

- 0 I am no more tired or fatigued than usual.
- 1 I get more tired or fatigued more easily than usual.
- 2 I am too tired or fatigued to do a lot of the things I used to do.
- 3 I am too tired or fatigued to do most of the things I used to do.

**21. Loss of interest in Sex**

- 0 I have not noticed any recent change in my interest in sex.
- 1 I am less interested in sex than I used to be.
- 2 I am much less interested in sex now.
- 3 I have lost interest in sex completely.

## Appendix G: State-Trait Anxiety Inventory- Trait (STAI-T)

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then circle the number to the right of the statement to indicate how you generally feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

21.	I feel pleasant	1	2	3	4
22.	I feel nervous and restless	1	2	3	4
23.	I feel satisfied with myself	1	2	3	4
24.	I wish I could be as happy as others seem to be	1	2	3	4
25.	I feel like a failure	1	2	3	4
26.	I feel rested	1	2	3	4
27.	I am "calm, cool and collected"	1	2	3	4
28.	I feel that difficulties are piling up so that I cannot overcome them	1	2	3	4
29.	I worry too much over something that really doesn't matter	1	2	3	4
30.	I am happy	1	2	3	4
31.	I have disturbing thoughts	1	2	3	4
32.	I lack self-confidence	1	2	3	4
33.	I feel secure	1	2	3	4
34.	I make decisions easily	1	2	3	4
35.	I feel inadequate	1	2	3	4
36.	I am content	1	2	3	4
37.	Some unimportant thought runs through my mind and bothers me	1	2	3	4
38.	I take disappointments so keenly that I can't put them out of my mind	1	2	3	4
39.	I am a steady person	1	2	3	4
40.	I get in a state of tension or turmoil as I think over my recent concerns and interests	1	2	3	4

## Appendix H: NEO Five Factor Inventory (NEO FFI)

This questionnaire contains 60 statements. Read each statement carefully. For each statement, circle the option that best represents your opinion.

	1	2	3	4	5
1. I am not a worrier.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
2. I like to have a lot of people around me.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
3. I don't like to waste my time daydreaming.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
4. I try to be courteous to everyone I meet.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
5. I keep my belongings clean and neat.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
6. I often feel inferior to others.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
7. I laugh easily.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
8. Once I find the right way to do something, I stick to it.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
9. I often get into arguments with my family and coworkers.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
10. I'm pretty good about pacing myself so as to get things done on time.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
11. When I'm under a great deal of stress, sometimes I feel like I'm going to pieces.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
12. I don't consider myself especially "light-hearted."	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
13. I am intrigued by the patterns I find in art and nature.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>

14. Some people think I'm selfish egotistical.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
15. I am not a very methodical person.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
16. I rarely feel lonely or blue.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
17. I really enjoy talking to people.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
18. I believe letting students hear controversial speakers can only confuse and mislead them.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
19. I would rather cooperate with others than compete with them.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
20. I try to perform all the tasks assigned to me conscientiously.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
21. I often feel tense and jittery.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
22. I like to be where the action is.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
23. Poetry has little or no effect on me.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
24. I tend to be cynical and skeptical of others' intentions.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
25. I have a clear set of goals and work toward them in an orderly fashion.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
26. Sometimes I feel completely worthless.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
27. I usually prefer to do things alone.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
28. I often try new and foreign foods.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>

29. I believe that most people will take advantage of you if you let them.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
30. I waste a lot of time before settling down to work.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
31. I rarely feel fearful or anxious.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
32. I often feel as if I'm bursting with energy.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
33. I seldom notice the moods or feelings that different environments produce.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
34. Most people I know like me.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
35. I work hard to accomplish my goals.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
36. I often get angry at the way people treat me.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
37. I am a cheerful, high-spirited person.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
38. I believe we should look to our religious authorities for decisions on moral issues.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
39. Some people think of me as cold and calculating.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
40. When I make a commitment, I can always be counted on to follow through.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
41. Too often, when things go wrong, I get discouraged	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
42. I am not a cheerful optimist.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>

43. Sometimes when I am reading poetry or looking at a work of art, I feel a chill or wave of excitement.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
44. I'm hard-headed and tough-minded in my attitudes.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
45. Sometimes I'm not as dependable or reliable as I should be.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
46. I am seldom sad or depressed.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
47. My life is fast-paced.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
48. I have little interest in speculating on the nature of the universe or the human condition.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
49. I generally try to be thoughtful and considerate.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
50. I am a productive person who always gets the job done.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
51. I often feel helpless and want someone else to solve my problems.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
52. I am a very active person.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
53. I have a lot of intellectual curiosity.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
54. If I don't like people, I let them know it.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
55. I never seem to be able to get organized.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
56. At times I have been so ashamed I just wanted to hide.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>

- |   |                          |                 |                |              |                       |
|---|--------------------------|-----------------|----------------|--------------|-----------------------|
| 57. I would rather go my own way than be a leader of others.            | <i>Strongly Disagree</i> | <i>Disagree</i> | <i>Neutral</i> | <i>Agree</i> | <i>Strongly Agree</i> |
| 58. I often enjoy playing with theories or abstract ideas.              | <i>Strongly Disagree</i> | <i>Disagree</i> | <i>Neutral</i> | <i>Agree</i> | <i>Strongly Agree</i> |
| 59. If necessary, I am willing to manipulate people to get what I want. | <i>Strongly Disagree</i> | <i>Disagree</i> | <i>Neutral</i> | <i>Agree</i> | <i>Strongly Agree</i> |
| 60. I strive for excellence in everything I do.                         | <i>Strongly Disagree</i> | <i>Disagree</i> | <i>Neutral</i> | <i>Agree</i> | <i>Strongly Agree</i> |