COUNTERING RUMINATION IN EVERYDAY LIFE: AN INVESTIGATION OF DAILY SELF-DISTANCING, DISTRACTION, AND CONCRETE ANALYSIS IN A RUMINATIVE POPULATION

by

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ABSTRACT

Rumination has been consistently associated with the development and maintenance of a variety of psychological disorders, most notably Major Depressive Disorder. While recent applied and experimental research has investigated a number of different strategies to counter rumination and its negative effects, few studies have directly compared these strategies, and even fewer have investigated their efficacy outside of a clinical or laboratory context. The current study uses a daily diary methodology to compare the efficacy of four such strategies in the everyday lives of a sample of college students high on trait rumination. Over the course of 10 days, participants were asked to apply one of four perspectives to their thoughts and emotions from the most stressful event of the day: Immersed (a ruminative perspective), distanced, a concrete and specific perspective, or distraction. Distraction was associated with the most change in negative mood, followed by distancing and then by concrete/specific analysis, which differed from immersion on only one measure. Only the distanced perspective was associated with less unproductive, ruminative processing (although this was a trend). Distancing was also associated with less blaming of others than immersed analysis. The implications of these findings for the prevention of rumination in treatment and in everyday life are discussed.
Chapter 1

INTRODUCTION

Rumination is the process of “repetitively and passively focusing on symptoms of distress and on the possible causes and consequences of these symptoms” (pg. 400, Nolen-Hoeksema, Wisco & Lyubomirsky, 2008). This process of repeated review and examination of distressing thoughts is unproductive and is a key predictor of the onset and maintenance of Major Depressive Disorder (MDD), as well as a number of other psychological disorders (Aldao, Nolen-Hoeksema & Schweizer, 2010; Ehring & Watkins, 2008). A ruminative response style is associated with a number of negative psychological consequences, including high levels of negative mood, low social support, and poor problem solving (Lyubomirsky, Caldwell & Nolen-Hoeksema, 1998; Moberly & Watkins, 2008; Nolen-Hoeksema et al., 2008). Rumination is not the only risk factor for developing depression or other psychological disorders, but it has been demonstrated to be more strongly associated with symptoms of psychopathology than most other styles of responding to distress (also called cognitive emotion regulation strategies; Aldao & Nolen-Hoeksema 2010; Aldao et al., 2010). Unproductive, repetitive thinking styles such as rumination are therefore central targets of psychotherapy for a number of disorders (Hayes, Masuda, Bissett, Luoma, & Guerrero, 2004; Segal, Williams, and Teasdale, 2002; Watkins et al., 2010). While both clinical and experimental studies (e.g. Kross & Ayduk, 2008; Lyubomirsky, Caldwell & Noel-Hoeksema, 1998) have examined a variety of adaptive strategies for reducing rumination, few have compared such strategies to one another directly. Still
fewer have explored the feasibility and effectiveness of teaching those at-risk for psychopathology to implement such strategies in their everyday life. The current study uses a daily diary methodology to compare the effectiveness of three emotion regulation strategies in reducing rumination and its negative consequences in a sample of undergraduates with high levels of trait rumination. These regulation strategies were compared with self-immersion, or the evaluative review of the causes for past emotion, which approximates the normative style of processing for high ruminators.

1.1 Rumination

Rumination is not only characteristic of those currently suffering from MDD, but also of those who have remitted from depression or are at risk for developing the disorder. This stability, apart from the symptoms of depression, suggests that rumination can be an ingrained way of responding to negative mood states (Just & Alloy, 1997; Nolen-Hoeksema, 1991). Multiple studies have shown that those who have a tendency to ruminate also exhibit overall deficits in cognitive control. Koster and colleagues propose an “Impaired Disengagement Hypothesis,” which suggests that the “central engine” of rumination is difficulty disengaging attention from negative information that relates to the self (Koster, De Lissnyder, Derakshan & De Raedt, 2010). Rumination is associated with problems inhibiting ineffective strategies and switching to new, more helpful strategies during the performance of cognitive tasks (Davis & Nolen-Hoeksema, 2000; Whitmer & Banich, 2007). In addition, ruminators have difficulty inhibiting negative emotional information in general, which may help explain the intrusive and perseverative nature of ruminative thought (e.g.
Joorman, 2004; Joorman, 2006; Joorman, 2010; Joorman & Gotlib, 2008). This line of research suggests that strategies used to counter rumination should aim towards increasing cognitive control, particularly in the areas of attentional control and the inhibition of negative emotional material.

1.2 Emotion Regulation Strategies that Counteract Rumination

1.2.1 Distraction

Many of the first experimental examinations of rumination compared this response style to distraction from negative thoughts and feelings (e.g. Lyubomirsky et al., 1998, Lyubomirsky & Nolen-Hoeksema, 1995; Nolen-Hoeksema & Morrow, 1993). These studies consistently reported fewer negative effects associated with distraction than with rumination, including lower negative mood, better problem solving, and less overgeneral autobiographical memory (remembering the past in an overly broad and categorical rather than specific way). In the short-term, distraction may provide relief from overwhelming emotions and thought patterns, but in the long-term, it may function as avoidance and inhibit productive cognitive and emotional processing (Kross & Ayduk, 2008). For instance, the goal of thought suppression is to avoid confronting disturbing cognitive material, but suppression has been associated consistently with paradoxical effects, such as more unwanted intrusive thoughts and symptoms of psychopathology (Markowitz & Purdon, 2008; Muris, Merckelbach & Horselenberg, 1996; Najmi & Wegner, 2008). These findings suggest a need for emotion regulation strategies that allow for the processing of emotional material.
without becoming stuck in unproductive cognitive and emotional feedback loops or avoiding the material all together.

1.2.2 Distancing and Decentering

One technique that has been found to facilitate productive processing of emotional material is “distanced analysis” (Kross, Ayduk, & Mischel, 2005). Multiple laboratory studies have demonstrated that analyzing a negative emotionally-laden event from a distanced, or third person, perspective is associated with less negative emotion and more adaptive processing of the event than recalling the event from an immersed, or first person, perspective (Kross & Ayduk, 2008; Kross et al., 2005; Wisco & Nolen-Hoeksema, 2011). Specifically, Kross and colleagues (2005) asked participants to reflect upon a personal memory in which they had felt angry or hostile and to use either a distanced perspective, in which they were asked to “take a few steps back” and watch the event unfold from a distance, or an immersed perspective, in which they were asked to think about the event through their own eyes, “as if it were happening all over again.” In addition, participants were instructed to take a “what” focus by concentrating on the specific feelings and sensations that they were experiencing, or a “why” focus by concentrating on the causes and reasons behind their feelings. Those who took a “distanced why” perspective showed significantly lower levels of negative emotion in response to this task than the other three groups. Kross and colleagues (2005) suggest that a distanced perspective allows for abstract analysis of one’s feelings without activating maladaptive levels of negative affect, as occurs during ruminative, or what they refer to as “self-immersed” processing.
Other studies have found similar attenuations in negative emotion when participants are asked to use a distanced perspective to analyze sad or depressive memories (Kross & Ayduk, 2008; Wisco & Nolen-Hoeksema, 2011) or more general “unpleasant” events (Crawley, 2010), and also when viewing negatively-valanced social images (Koenigsberg et al., 2009; Koenigsberg et al., 2010). In addition, a number of studies have found distanced analysis to be associated with lower rates of intrusive thought, rumination, and negative affect over time (Ayduk & Kross, 2010; Kross & Ayduk, 2008).

Kross and his colleagues have examined potential mechanisms of the salutary effects of self-distancing by instructing participants to write about their thoughts and feelings in a stream-of-consciousness fashion (Kross & Ayduk, 2008; Kross et al., 2005). These studies report that the reduction in negative mood brought about by a distanced perspective is mediated by a higher proportion of “reconstruing” statements (statements of insight or closure) relative to “recounting” statements (statements that describe the specific chain of events, behaviors, or emotions experienced). Similarly, other studies have shown that when instructed to take a third person perspective, people tend to exhibit higher rates of self-understanding (Wilson & Ross, 2003) and find closure on past experiences sooner (Crawley, 2010). Together, these results suggest that thinking about the causes and consequences of one’s feelings can be adaptive, rather than ruminative, if done from a distanced perspective.

Findings from multiple treatments that employ methods similar to self-distancing corroborate these experimental results. For example, distancing oneself
somewhat from one’s thoughts and feelings, or “decentering,” is a central tenet of a number of ‘third-wave’ forms of cognitive behavioral treatment, such as Dialectical Behavior Therapy (Linehan, 1993), Mindfulness-Based Cognitive Therapy (Segal, Williams, and Teasdale, 2002), and Acceptance and Commitment Therapy (Hayes, Masuda, Bissett, Luoma, & Guerrero, 2004). Research examining the psychological processes at work in these and similar treatments have found decentering and “meta-awareness” to be central mechanisms of therapeutic change (e.g. Carmody, Baer & Lykins, 2009; Fresco, Segal, Buis & Kennedy, 2007; Hargus, Crane, Barnhofer & Williams, 2010).

1.2.3 Concrete or Specific Processing

A second technique that has been found to counteract the potentially adverse consequences of rumination is the use of a “concrete” or “specific” processing mode. Depressive rumination is usually characterized by negative, overgeneral, and very abstract construals that can be overwhelming and therefore difficult to productively examine, or to falsify. A number of researchers therefore have suggested that adopting a specific and concrete style of thinking about and processing emotional information should help to counteract its negative effects. Two separate studies have tested this effect by asking participants to unscramble negative sentences about themselves that emphasize the contextual aspects of mood (how mood usually changes across time and between situations) rather than emphasizing a more general or extreme view of mood (how mood can stay the same across situations) (Jacoby, Brewin, & Watkins, 2008; Watkins, Teasdale, & Williams, 2003). In both studies, participants in the
contextual condition reported lower levels of negative affect following a negative mood induction than those in the more abstract condition. Similarly, other experimental studies have shown that an abstract processing mode is associated with more negative affect and less positive affect following a negative experience than a concrete processing mode (Moberly & Watkins, 2006; Watkins et al., 2008). Moberly and Watkins (2006) reported that trait rumination moderated this effect, such that rumination was associated with a less positive affect in the abstract, evaluative condition, but not in the concrete condition. Recent research has shown that a concrete processing style may not only aid in decreasing negative emotional reactivity, but also in preventing other negative effects of rumination. Werner-Seidler and Moulds (2012) found that when depressed participants were asked retrieve positive autobiographical memories to repair a negative mood state, only those who had been trained to use a concrete or specific processing mode were successful. Furthermore, adopting a concrete mode of processing has been shown to lead to better social problem solving and to reduce overgeneral autobiographical memory (Watkins & Moulds, 2005; Watkins & Teasdale, 2001; Watkins & Teasdale, 2004).

Multiple treatment modalities have been developed that focus, whether primarily or secondarily, upon using concrete processing to counter the tendency to ruminate. Mindfulness-based therapies such as Acceptance and Commitment Therapy (Hayes et al., 2004) and Mindfulness-Based Cognitive Therapy (Segal, Williams, and Teasdale, 2002) explicitly teach patients to focus on immediate, concrete experience rather than on the past, the future, or broad self-relevant themes. Rumination-Focused
Cognitive Behavioral Therapy (RF-CBT) was recently developed to help depressed patients switch from a ruminative thought style to a more concrete and experience-focused thought style. A randomized control trial comparing RF-CBT to treatment-as-usual suggests that this therapy is effective in reducing depressive symptoms, and that this reduction is mediated by a significant reduction in rumination (Watkins et al., 2010). Interestingly, studies have shown that “concreteness training,” an intervention that uses techniques similar to RF-CBT but is administered in a guided, self-help format, is also effective at reducing rumination and depressive symptoms (Watkins et al., 2012). These studies suggest that increasing concreteness and specificity when processing emotional information may be a key strategy for counteracting or even preventing the ruminative thought cycle.

1.3 The Current Study

The current study aims to compare the effectiveness of four different emotion regulation strategies, three of which have been found in previous research to be helpful in preventing or reducing rumination. A sample high in trait rumination was used so that these strategies could be examined in participants at risk for depression. We instructed participants to recall a stressful event from their day and to either distract themselves from it, or analyze it using a ruminative style, a distanced style, or a concrete and specific style. Participants were asked to rate their mood before and after the task in order to examine change in negative mood across strategies. They were also asked to write a short narrative about their thoughts during this task to examine cognitive and emotional processing. We used a daily-diary methodology to
examine the usefulness of these strategies over 10 days in their everyday life, rather than in the laboratory.

We predicted that distraction, distanced analysis, and concrete analysis of a stressful event would be associated with less negative mood than ruminative (immersed) analysis. Based on previous findings by Kross and colleagues (Kross & Ayduk, 2008), we expected the distanced analysis condition to be associated with higher levels of productive, insightful processing and with lower levels of unproductive, ruminative processing than the ruminative analysis condition. We did not have a prediction regarding the level of productive processing in the concrete condition, but we did predict that this condition would be associated with lower levels of unproductive, ruminative processing than the ruminative condition, and perhaps even than the distanced condition.
Chapter 2

METHOD

2.1 Participants

Participants were undergraduate students at the University of Delaware who completed the experiment to fulfill their research participation requirement. All potential participants completed pretesting measures, and those who scored within the top quartile (score of 95 or higher) on the Ruminative Thought Style questionnaire (RTS; Brinker & Dozois, 2009) were invited to participate in this study ($N = 164$). Participants were required to be native English speakers, as Kross and Ayduk (2008) recommend, because of the difficulties that non-native English speakers may have following the recall task instructions and writing the narratives that are part of the study design. The sample was mostly female (69.8%) and primarily Caucasian (84%) but also included Non-Hispanic African-American (4.3%), Hispanic (2.5%), and Asian (1.9%) participants, and those who endorsed, “unknown” (2.5%). Another eight participants (4.9%) chose not to provide their ethnicity. The mean age of participants was 18.97 years ($SD = 0.90$, range = 18 to 22).

2.2 Initial Survey Measures

First, participants were randomly assigned to one of four conditions: Distanced, immersed, concrete/specific, and distraction. Participants were then invited to attend an informational meeting, which was held separately for each condition. At these meetings, the research staff described the study procedures for each group, obtained participants’ informed consent, and instructed participants on how to
complete the online measures. Immediately following these meetings, research staff emailed all participants a link to a one-time, online initial questionnaire which they asked participants to complete by a specified time. This questionnaire included questions regarding demographic information, as well as the Beck Depression Inventory II (BDI-II, Beck, Steer & Brown, 1996).

2.3 Daily Measures and Procedures

After completing the initial survey, participants completed identical online surveys each evening for 10 consecutive days.

2.3.1 Daily Negative Events

Within each survey, participants were given a checklist of common daily stressors adapted from two previous college student diary studies (Dasch, Cohen, Sahl & Gunthert, 2008; LoSavio et al., 2011). The list contained 19 negative events, those interpersonal in nature and not. Interpersonal events included items such as, “Asked a friend, family member, or romantic partner to spend time together, and he or she said no.” and “A friend, family member, or romantic partner was displeased with me.” Non-interpersonal events included any negative events that did not directly involve other individuals, for example, “Received a low test grade today.” and “Experienced a financial problem.” Additional non-interpersonal events included personal illness, illness or injury, and hassles. Participants indicated whether or not each event occurred that day.
2.3.2 Most Stressful Daily Event

Participants were then asked to identify which of the negative events from the checklist was “the worst, most stressful event of the day.” If the most stressful event they experienced did not fit into one of the categories provided, they were asked to provide a brief description of it. Participants were then asked three questions regarding this event, which were worded as follows: “How stressful was this event in comparison to other stressful events you have experienced in the past?” “How unpleasant was this event?,” and “How resolved is this event at this moment?” Participants answered these questions using Likert-type scales that ranged from 1 (“among the least stressful,” “slightly unpleasant,” and “completely unresolved,” respectively) to 5 (“among the most stressful,” “extremely unpleasant,” and “completely resolved.”).

2.3.3 Positive And Negative Affect Schedule (PANAS)

Participants were then asked to complete the PANAS, which has been shown to have high reliability and internal consistency in undergraduate and community samples (Clark, Watson, & Tellegen, 1988; Crawford & Henry, 2004). The PANAS assesses current mood by asking participants to rate the extent to which they are currently feeling 20 different emotions “right now” on a Likert-type scale from 1 (not at all) to 5 (extremely). Ten items are used to create a measure of negative affect (the sum score of all negative affect items), and ten items are used to create a measure of positive affect (the sum score of all positive affect items). The negative affect scale includes the emotion words distressed, upset, guilty, scared, hostile, irritable, ashamed,
nervous, jittery, and afraid. Internal consistency for this scale in the current sample was high ($\alpha = 0.896$). The positive scale includes the emotion words interested, excited, strong, inspired, attentive, proud, enthusiastic, alert, determined, and active. Internal consistency for the positive affect scale in the current sample was also high ($\alpha = 0.992$).

2.3.4 Memory Recall Task

After completing the self-report questionnaires, participants were cued to recall the event they indicated as “the most stressful” earlier in the survey. They were then asked to recall this event through a guided imagery task adapted from previous research (Kross & Ayduk, 2008; Kross et al., 2005). In contrast to previous research in which guided imagery instructions were given orally, instructions were displayed in text form within the survey. Participants were assigned to one of four guided imagery scripts based on their experimental condition. The four conditions were: Immersed, distanced, concrete/specific, and distraction. The immersed, distanced, and distraction conditions all included two phases. The first phase was presented on its own survey page and instructed participants to adopt a specific perspective: either immersed (e.g. “Go back to the time and place of the stressful experience you just recalled…see the experience unfold…as if it were happening to you all over again”), distanced (“Go back to the time and place of the experience you just recalled…move away from the situation to point where you can now watch the event unfold from a distance and see yourself in the event”), or concrete/specific (“Go back to the time and place of the stressful experience you just recalled…focus your attention on the specific details of...
the event, such as the time of day, the location, what was said…do not focus on how this event relates to broad and general themes”). Participants were then instructed to replay the experience in their imagination from the perspective they were told to adopt; they were given 20 seconds to do this. The next survey page instructed participants in the second phase of the guided imagery task, which asked them to analyze their feelings for 60 seconds from the perspective that they were told to adopt. On this page, instructions to those in the immersed condition were: “As you continue to see the situation unfold through your own eyes, try to understand your feelings. Think about how they connect to the past and future. Why did you have those feelings? What were the underlying causes and reasons?” Instructions in the distanced conditions were, “As you continue to see the situation unfold to your distant self, try to understand his/her deepest feelings. Why did she (he) have those feelings? What were the underlying causes and reasons?” Lastly, instructions to participants in the concrete condition were, “As you continue to see the specific details of the situation unfold, try to understand your deepest feelings. Why did you have those feelings in response to that event? What about the event in that moment, caused those feelings? Focus on specific details of the event that happened today. Do NOT focus on the past, the future, or other broad or general themes.”

The distraction condition consisted of a series of six neutral statements (e.g. “Florida produces many oranges,” “Scotland is north of England”), which were presented – one page at a time – in the survey. The participants were given 15 seconds to close their eyes and visualize each statement, so as to match the duration of the
guided imagery instructions for the other experimental groups. Statements were taken from a pool of 26 total statements, and participants were given a different combination of these statements each day they completed the survey. These statements were taken from Kross and Ayduk (2008), who conducted pilot work to establish a series of affectively neutral statements.

2.4 Thought Narratives and Coding

Following the study design of Kross and colleagues (Kross & Ayduk, 2008), participants were asked to write a narrative describing their thoughts as they completed the guided imagery or distraction task. They were instructed to write in “stream of consciousness style,” describing the thoughts that flowed through their mind during the tasks. Each essay was coded for the types of thought content participants exhibited during the recall task.

A team of coders, blind to condition and study hypotheses, rated participant essays using two different coding systems. One coding system was developed by Kross and colleagues (Kross & Ayduk, 2008; Kross et al., 2005) and has been used in their studies comparing immersed to distanced processing of emotional events. The other coding system, the CHANGE (Hayes, Feldman & Goldfried, 2006), was designed to capture unproductive and productive processing of emotionally relevant material, as well as avoidance. Coders were four undergraduate research assistants. They were first trained on both coding systems, and all four coders coded the same narratives until they reached a criterion agreement level of 80%. Following this training period, one coder rated each narrative using both coding systems, with 25% of
the narratives coded by all four coders for criterion checks. In addition, word use data were extracted from all narratives using Linguistic Inquiry and Word Count (LIWC; Pennebaker, Booth, & Francis, 2007), an automated text analysis program.

Participants in the distraction condition also wrote narratives about the thoughts that flowed through their mind during the distraction task. However, these statements were not coded, as these narratives related to the neutral statements participants were exposed to in the distraction condition (e.g. “The oranges were moist and bright in a Florida field;” “I thought of Scotland physically standing on top of England”).

2.4.1 Thought Content Coding System: Recounting/Reconstruing

The coding system for thought content was based on the coding system used by Kross and colleagues in previous research (e.g. Kross & Ayduk, 2008; Kross et al., 2005). The coding system includes a range of variables to assess recounting (“what” statements) and reconstruing (“why” statements) in participant essays. Recounting was calculated from a composite of two variables: Description and Blame Description statements give an account of the event, including emotions felt, the chain of events, behaviors of the participant and others involved. Blame is defined as unhelpful reasoning that focuses on putting responsibility for the event, or aspects of it, on another person or institution. An example of high recounting is:

I was still upset from last night because he didn’t text me back after we fought on the phone. I texted and called him many times but got no response, and at noon today I called to make sure he was alive because he wasn’t answering me. He said hello on the phone, and I hung up because I was upset that he saw
my texts and didn’t care that I was in pain. It just really hurts because he’s still being mean to me when he should have just apologized.

Reconstruing was calculated from a composite of two variables: Insight and Closure. Insight statements demonstrate a realization or shift in the way the participant understood the event, including the cause of the event, his or her behavior and emotions, or the behavior and emotions of others. Closure is defined as the extent to which the participant indicates that he or she was able to move on from the event or think of the event in a broader context of past and current experiences. An example of a narrative with high reconstrual is:

I was relieved because I realized the situation was not as bad as I thought. Re-watching this experience taught me to not automatically freak out, because more often than not things tend to turn out okay. I realized I should stop overreacting at the time a stressful event occurs because there is usually a way to solve it.

Inter-rater agreement was estimated by intraclass correlations (ICC; Shrout and Fleiss, 1979), using the ratings of all four coders on the 208 sets of criterion narratives. Inter-rater agreement was high for all four subscales: Description (ICC = 0.79), Blame (ICC = 0.90), Insight (ICC = 0.77) and Closure (ICC = 0.78).

2.4.2 CHANGE Coding System

The CHANGE system (Hayes et al., 2006) was used to code the content of participant narratives. CHANGE can be used to code narratives or therapy sessions. The coding system includes a range of variables that assess cognitive, affective, behavioral, somatic, and interpersonal aspects of functioning, as well as avoidance, cognitive-emotional processing, and unproductive processing. Each variable is coded on a scale from 0 to 3 (0 = not present or very low, 1 = low, 2 = medium, 3 = high).
Variables are not mutually exclusive and can co-occur. Two CHANGE categories were used in this study. The first category was unproductive processing, which is defined as the extent to which the person approaches a problem, explores, and tries to understand or make meaning from it but gets stuck repetitively thinking about it or analyzing it. This can include ruminating, worrying, and unproductive venting. An example of a narrative with a high level of unproductive processing is:

*I’m just really nervous I didn’t do well. I bombed the first test, and I need to get a good grade on this test to even pass the class. I already dropped one class this semester, so I have to do well or I’ll be a total failure. It’s not good and I need the credits, so I must get a good grade but it was so hard…It’s the only thing on my mind right now…I feel like I’m going crazy*

The second category was cognitive-emotional processing, which is defined as the extent to which the person attempts to question, explore, challenge, and make meaning of an experience. The category ranges from exploring and questioning a problem area (low) to showing substantial insight, understanding, and meaningful perspective shift (high). An example of a narrative with a high level of cognitive-emotional processing is:

*The pressure to come in first place again was really tough today…I saw some of the competitions and it really worried me. When looking back, I realized that all I’ve done is worry and stress about things that I really have no control over. Either way, if we do win or even if we don’t win, I'm still really proud of everyone and also really proud of myself for getting this far. Although I'm in second place, that’s still a big accomplishment.*

Inter-rater agreement on the unproductive processing category was high (ICC=0.82). Agreement on the cognitive-emotional processing category was lower (ICC=0.53), falling close to what is considered a moderate level of agreement (ICC=0.60; Shrout &
Fleiss, 1979). Because cognitive-emotional processing was a low frequency category when applied to daily events rather than major life events or in the context of therapy, we also examined the percent agreement within one-point on the 0-3 rating scale of the CHANGE, as the intra-class correlation is very sensitive to low frequency (Shrout and Fleiss, 1979). Coders demonstrated 84.6% agreement within one point or less, indicating that inter-rater agreement might be higher than was suggested by the ICC.

2.4.3 Linguistic Inquiry and Word Count (LIWC) Program

LIWC is text analysis software developed by Pennebaker and colleagues (2007) that analyzes writing and/or speech samples on a word-by-word basis. LIWC was used to analyze participant narratives by checking their linguistic content against an internal dictionary (LIWC English Dictionary, 2007). The dictionary consisted of a number of different linguistic categories, two of which were of interest in this study: positive emotion words (e.g. love, nice, sweet) and negative emotion words (e.g. hurt, ugly, nasty). The program calculated the percentage of words in each narrative that belonged to each of these categories. These data could then be used as dependent variables.

2.5 Post-Task Mood and Instructions

After completing the thought narrative, participants were given a series of post-task questionnaires to assess mood (PANAS), engagement in the experiment, and the effectiveness of the experimental manipulations. Lastly, participants were instructed to use the technique that had been taught (distancing, immersion, concreteness and distraction) in response to any stressful events that occurred over the
following day. At the beginning of all of the surveys (except for the first survey), participants were asked to indicate how often they employed this technique over the course of the previous day, which was measured by a 7 point scale (1 = *not at all*, 7 = *very frequently*). They were also asked to indicate how much time they spent using the technique over the previous day, which was measured by a 6 point scale (1 = *no time*, 6 = *more than 60 minutes*).

### 2.6 Data Analytic Plan

Data were analyzed using Hierarchical Linear Modeling techniques (HLM; Raudenbush & Bryk, 2002). HLM employs maximum likelihood estimation, which accommodates missing data and is particularly useful for analyzing data within a nested structure (e.g. daily assessments within persons). To examine group differences, three dummy variables were created for condition (distraction = 1, other conditions = 0; distancing = 1, other conditions = 0; concreteness = 1, other conditions = 0), and the immersed condition was used as a reference group. These dummy variables were then entered as Level 2 predictors, which allowed for effect of each condition to be examined separately in comparison to the reference group. The outcomes of interest were the mean levels of each daily variable rather than the change of these variables over time, and therefore only intercepts, and not slopes, were estimated. Study day was entered as a control variable at level 1. The amount of time spent practicing the technique over the previous day and the frequency with which the technique was practiced were conceptualized as measures of study engagement. These two items were converted into z-scores and added together to form a composite
variable, Technique Practice. Preliminary analyses indicated that groups differed significantly on this variable, such that those in the distraction group practiced less than those in the immersed group \((B_{\text{distraction}}) = -0.35, SE = 0.16, t = -2.18, p = .031\), the concrete group \((B_{\text{distraction}}) = -0.68, SE = 0.16, t = -4.09, p < .001\), and the distanced group \((B_{\text{distraction}}) = -0.34, SE = 0.17, t = -1.99, p = .049\). To account for these differences, Technique Practice was entered as a control variable at level 1, as was done by Kross and Ayduk (2008). Both control variables were centered around the grand mean (the mean of each respective variable across all conditions).

The effect of condition on each outcome was modeled as follows:

**Level 1 Model:**

\[
\text{OUTCOME}_{it} = \pi_{0i} + \pi_{1i} \times (\text{STUDY DAY}_{it}) + \pi_{2i} \times (\text{TECHNIQUE PRACTICE}_{it}) + e_{it}
\]

**Level 2 Model:**

Intercept: \(\pi_{0i} = \beta_{00} + \beta_{01} \times (\text{CONCRETE}_i) + \beta_{02} \times (\text{DISTANCED}_i) + \beta_{03} \times (\text{DISTRACT}_i) + r_{0i}\)

Slope(\text{STUDY DAY}): \(\pi_{1i} = \beta_{10}\)

Slope(\text{TECHNIQUE PRACTICE}): \(\pi_{2i} = \beta_{20}\)

In other words, at Level 1, each outcome (e.g. change in mood) for a person \((i)\) at any given day \((t)\) is estimated to be a function of that person’s outcome at mean level of technique use and study day (i.e. controlling for technique use and study day) \((\pi_{0i})\), the day on which that outcome was collected \((\pi_{1i})\), the amount of time that person spent using the technique over that day \((\pi_{2i})\), and random error \((e_{it})\). At Level 2, \(\pi_{0i}\) represents a person’s intercept (their expected value of that outcome, controlling for day and
technique use) as a function of $\beta_{00}$ or the average intercept for those in the reference group, the effect of the remaining three conditions respectively ($\beta_{01}, \beta_{02}, \beta_{03}$), and random error ($r_{0i}$).

For those outcomes that had significantly positively skewed, non-normal distributions, Poisson models were estimated using the same predictors. These variables were positive and negative emotion word use, unproductive processing, cognitive emotional processing, and reconstruing. Poisson models are often used for count data, or other data that begin at 0 and have positively skewed distributions, as they allow for non-normal and heteroscedastic error structures, whereas standard HLM does not.

Level 1 Model:

$$E(\text{OUTCOME}_i | \pi_i) = \lambda_{\pi_i}$$

$$\log[\lambda_{\pi_i}] = \eta_{\pi_i}$$

$$\eta_{\pi_i} = \pi_{0i} + \pi_{1i}*(\text{STUDY\ DAY}_i) + \pi_{2i}*(\text{TECHNIQUE\ PRACTICE}_i)$$

Level 2 Model:

Intercept: $\pi_{0i} = \beta_{00} + \beta_{01}*(\text{CONCRETE}_i) + \beta_{02}*(\text{DISTANCED}_i) + \beta_{03}*(\text{DISTRACT}_i) + r_{0i}$

Slope(\text{STUDY\ DAY}): $\pi_{1i} = \beta_{10}$

Slope(\text{TECHNIQUE\ PRACTICE}): $\pi_{2i} = \beta_{20}$

As outcomes are conceptualized as count variables, the event rate, or the expected value of the outcome ($\lambda_{\pi_i}$), cannot be less than zero. This expected value ($\lambda_{\pi_i}$) is therefore log transformed so that estimated value ($\eta_{\pi_i}$) can take on any real value,
rather than being constrained to non-negative numbers (Raudenbush, Bryk, Cheong, Congdon & du Toit, 2011). This value ($\eta_i$) is then estimated identically to the standard HLM functions described above.
Chapter 3
RESULTS

Means and standard deviations for all major study variables are presented in Table 1.

3.1 Exclusions

Out of 164 recruited participants, three completed surveys on less than 50% of the possible study days. These three participants were excluded, and 161 participants were included in final analyses.

3.2 Content of Narratives

Each daily event that was indicated as “most stressful” was categorized into one of four types: Interpersonal, non-interpersonal, personal injury/illness/accident, and hassle. Most of the stressful events reported were non-interpersonal (47.4%), and 30.3% were interpersonal, 6.3% were personal injuries, illnesses, or accidents, and 16% were hassles.

3.3 Manipulation Checks

To assess the extent to which participants adopted an immersed versus a distanced perspective during the experiment, two questions were asked: “During the recall task, to what extent did you experience the event through your own eyes, as if it were happening all over again?” and “During the recall task, to what extent were an observer of your stressful experience?” Participants were asked to rate the extent to which they recalled the event through their own eyes and the extent to which they were an observer of the recalled event on two 7-point, Likert-type scales. To compare
groups on answers to these questions, each was entered as an outcome in a separate HLM model, using the same covariates as when estimating the primary study outcomes. Analyses indicated that participants in the distanced group reported lower scores on experiencing the event through their own eyes than the immersed group ($B_{distance} = -0.69, SE = 0.25, t = -2.80, p = 0.006$) and higher scores on feeling like observers of the event ($B_{distance} = 0.56, SE = 0.26, t = 2.16, p = 0.033$). These results indicated that the manipulation was successful. The concrete group did not differ from the immersed group on the extent to which they felt like they were experiencing the event through their own eyes, $B_{concrete} = -0.07, SE = 0.25, t = -0.30, p = .765$, nor on the extent to which they felt like an observer $B_{concrete} = 0.11, SE = 0.26, t = 0.41, p = 0.680$. This suggests that those in the concrete group were more similar to the immersed group in their perspective than the distanced group. Although there was no specific question that was used as a manipulation check for the concrete/specificity manipulation, groups were compared on the number of past-focused words as measured by the LIWC (rather than present or future-focused) that they used in their narratives. Participants in the concrete group expressed significantly more past-focused words than those in the immersed group, $B_{concrete} = 1.30, SE = 0.61, t = 2.15, p = 0.034$. These results suggest that participants in the concrete group were focusing significantly more on the past event and less on present or future consequences of the event than the immersed group. These findings suggest that the manipulation of a concrete/specific style was successful.
3.4 Mood Reactivity

3.4.1 Pre- to Post-Test Changes in Self-Reported Mood

First, difference scores were computed by subtracting pre-test PANAS scores from post-test PANAS scores for the negative and positive PANAS scales, respectively. Positive difference scores indicate an increase from pre-test to post-test on each scale (i.e. an increase in negative mood and an increase in positive mood), whereas negative scores indicate a decrease on each scale.

Change in negative mood was the outcome variable in the first HLM model. As previously stated, study day and level of technique practice were entered into the model as Level 1 control variables, and dummy codes representing study condition were entered as predictors at Level 2. This analysis revealed that study condition did predict change in negative mood. Specifically, the distanced group and the distraction group were both significantly less likely to exhibit an increase in negative mood following the manipulation than the immersed group (see Table 2). The distraction group’s change in negative mood was also significantly lower than that of the distanced group $B_{\text{distraction}} = -1.03$, $SE = 0.34$, $t = -3.00$, $p = .003$, and the concrete group, $B_{\text{concrete}} = -1.03$, $SE = 0.34$, $t = -3.00$, $p = .003$. The concrete group’s average change in negative mood was not significantly different from that of the immersed group (see Table 2). There were no group differences when change in positive mood was the outcome variable.
3.4.2 Emotion Words in Thought Narratives

The percentage of emotion words per narrative (as calculated by the Linguistic Inquiry and Word Count program, Pennebaker, Booth & Francis, 2007) was used as additional measure of mood. Results indicated that condition significantly predicted negative emotion word use, such that the concrete group, the distanced group, and the distraction group all exhibited a lower percentage of negative emotion words in their thought narratives than did the immersed group (see Table 2). The concrete and distanced groups did not differ from one another in their use of negative emotion words, \( \exp(B_{\text{distanced}}) = 1.00, SE = 0.07, t = 0.07, p = 0.944 \). Not surprisingly, the distraction group expressed significantly fewer negative emotion words than the concrete group, \( \exp(B_{\text{concrete}}) = 2.20, SE = 0.10, t = 8.25, p < .001 \), and than the distanced group, \( \exp(B_{\text{distanced}}) = 2.21, SE = 0.10, t = 8.40, p < .001 \). Conditions also differed on positive emotion word use, such that the concrete group expressed a lower percentage of positive words in their narratives than the immersed group, whereas the distanced and distraction groups did not differ significantly from the immersed group (see Table 2). Further analyses revealed that the concrete group also used significantly fewer positive emotion words in their narratives than the distanced group, \( \exp(B_{\text{distanced}}) = 1.39, SE = 0.09, t = 3.83, p < .001 \), and the distraction group, \( \exp(B_{\text{distraction}}) = 1.37, SE = 0.09, t = 3.56, p < .001 \).
3.5 Thought Content

To examine differences in thought content, all variables coded from the participant thought narratives were entered as separate outcome variables in Poisson HLM models, as all the narrative variables had count-like distributions (e.g. positively skewed distributions with low means) and represented the extent to which a given thought content variable occurred.

3.5.1 Unproductive, Ruminative Processing

Conditions differed on the level of unproductive processing (CHANGE scale) in participants’ thought narratives. Participants in the distanced group were rated as having lower levels of unproductive processing than those in the immersed group, and participants in the concrete group did not differ from those in the immersed group (see Table 3). However, the difference between the immersed and distanced groups was only marginally significant. Further analyses revealed that the distanced group did not significantly differ from the concrete group, $\exp(B_{\text{concrete}}) = 1.11, SE = 0.17, t = 0.61, p = .542$.

An unexpected finding was that recounting differed significantly across conditions. Both the concrete group and the distanced group exhibited significantly more recounting than the immersed group (see Table 3). In order to better interpret this effect, the subscales of recounting (description and blame) were entered as separated outcomes. The concrete and distanced groups had significantly higher levels of description than the immersed group. In contrast, the level of blame in
participant narratives was lower in the distanced group than in the immersed group, while the concrete group did not differ from the immersed group on this variable.

3.5.2 Insight and Cognitive-Emotional Processing

Cognitive emotional processing (CHANGE coding) in participant narratives did not significantly differ across groups. Reconstruing (Kross coding) did differ across groups, although this effect was only marginally significant (see Table 4). Specifically, the concrete group exhibited marginally lower levels of reconstruing than the immersed group, whereas the distanced group did not differ from the immersed group. In order to better interpret this effect, the subscales of Kross’s reconstruing scale (insight and closure) were then analyzed as separate outcomes. In contrast with hypotheses, results indicated that participants in the distanced group showed significantly less insight than participants in the immersed condition. Participants in the concrete group also showed lower levels of insight than those in the immersed group. Conditions did not differ on the level of closure expressed in their narratives.
Table 1.

**Descriptive Statistics of Study Variables across Experimental Groups**

<table>
<thead>
<tr>
<th></th>
<th>Immersed Mean (SD)</th>
<th>Concrete Mean (SD)</th>
<th>Distanced Mean (SD)</th>
<th>Distraction Mean (SD)</th>
</tr>
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<tbody>
<tr>
<td><strong>Mood Variables</strong></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Change in Neg Mood</td>
<td>0.95 (4.49)</td>
<td>0.60 (3.11)</td>
<td>0.14 (3.20)</td>
<td>-1.04 (4.26)</td>
</tr>
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<td>Change in Pos Mood</td>
<td>-0.57 (4.05)</td>
<td>-1.19 (3.47)</td>
<td>-0.79 (3.41)</td>
<td>-1.09 (4.57)</td>
</tr>
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<td>% Neg Emotion Words</td>
<td>0.05 (0.02)</td>
<td>0.04 (0.02)</td>
<td>0.04 (0.02)</td>
<td>0.02 (0.019)</td>
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<tr>
<td>% Pos Emotion Words</td>
<td>0.026 (0.018)</td>
<td>0.021 (0.016)</td>
<td>0.029 (0.022)</td>
<td>0.028 (0.02)</td>
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<td><strong>Thought Content Variables</strong></td>
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<td></td>
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<tr>
<td>Unproductive Process.</td>
<td>0.86 (0.92)</td>
<td>0.77 (0.91)</td>
<td>0.70 (0.91)</td>
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<tr>
<td>Recounting</td>
<td>1.35 (0.59)</td>
<td>1.53 (0.53)</td>
<td>1.52 (0.44)</td>
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<tr>
<td>Description</td>
<td>2.12 (0.78)</td>
<td>2.50 (0.61)</td>
<td>2.63 (0.53)</td>
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<td>Blame</td>
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<td>0.57 (0.87)</td>
<td>0.41 (0.72)</td>
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<td>Cog-Emo Processing</td>
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<td>0.19 (0.44)</td>
<td>0.20 (0.46)</td>
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<td>Reconstruing</td>
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<td>0.41 (0.44)</td>
<td>0.45 (0.46)</td>
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</tr>
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<td>Insight</td>
<td>0.78 (0.79)</td>
<td>0.55 (0.64)</td>
<td>0.62 (0.68)</td>
<td></td>
</tr>
<tr>
<td>Closure</td>
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<td>0.26 (0.53)</td>
<td>0.54 (0.28)</td>
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<td><strong>Daily Technique Practice</strong></td>
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<td></td>
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<tr>
<td>Frequency of Practice</td>
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<td>3.00 (1.31)</td>
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<td>2.09 (1.35)</td>
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<td>Practice Time</td>
<td>2.08 (0.96)</td>
<td>2.33 (0.86)</td>
<td>2.16 (1.25)</td>
<td>1.72 (1.02)</td>
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<td><strong>Ruminative Thoughts Scale</strong></td>
<td>112.97 (11.44)</td>
<td>107.61 (9.55)</td>
<td>107.93 (10.00)</td>
<td>112.7 (12.2)</td>
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</table>
Table 2

*Mood Reactivity Comparisons by Condition*

<table>
<thead>
<tr>
<th>Condition</th>
<th>B</th>
<th>SE</th>
<th>t-ratio</th>
<th>p</th>
</tr>
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<tr>
<td><strong>Change in Negative Mood (PANAS Negative Scale)</strong></td>
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<tr>
<td>Immersed (intercept)</td>
<td>0.93</td>
<td>0.27</td>
<td>3.44</td>
<td>&lt;0.001</td>
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<td>-0.21</td>
<td>0.831</td>
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<tr>
<td>Distanced</td>
<td>-0.81</td>
<td>0.38</td>
<td>-2.14</td>
<td>0.032</td>
</tr>
<tr>
<td>Distraction</td>
<td>-1.85</td>
<td>0.38</td>
<td>-4.85</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td><strong>Change in Positive Mood (PANAS Positive Scale)</strong></td>
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<td></td>
<td></td>
</tr>
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<td>Immersed (intercept)</td>
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<td>0.27</td>
<td>-1.63</td>
<td>0.105</td>
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<td>0.545</td>
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<td>Distraction</td>
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<td>0.37</td>
<td>-1.31</td>
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<td><strong>Negative Emotion Words</strong>*</td>
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<tr>
<td>Immersed (intercept)</td>
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<tr>
<td>Concrete</td>
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<td>Distraction</td>
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<td>-10.43</td>
<td>&lt;0.001</td>
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<td><strong>Positive Emotion Words</strong>*</td>
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<td>1.10</td>
<td>0.08</td>
<td>1.12</td>
<td>0.266</td>
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</table>

*Note. Coefficients for concrete, distanced and distraction groups represent the difference of each respective group (its model-implied mean) from the intercept (the model implied mean for the immersed group). PANAS = Positive and Negative Affect Scale. Bold font signifies a significant difference at \( p < 0.05 \).*

* = Outcome has poisson distribution, therefore reported \( B \) is exponentiated and represents an event rate ratio.
<table>
<thead>
<tr>
<th>Condition</th>
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<td>SE</td>
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<td>Immersed (intercept)</td>
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<td>2.75</td>
<td>0.006</td>
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<td>5.25</td>
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<td><strong>Blame</strong>* (subscale of recounting)</td>
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<td>0.69</td>
<td>0.18</td>
<td>-2.03</td>
<td>0.045</td>
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</table>

*Note. Coefficients for concrete, distanced and distraction groups represent the difference of each respective group (its model-implied mean) from the intercept (the model implied mean for the immersed group). Bold font signifies a significant difference at $p < 0.05$. Italics signify a marginally significant difference at $p < 0.10$.

* = Outcome has poisson distribution, therefore reported $B$ is exponentiated and represents an event rate ratio.
Table 4

*Thought Content Comparisons by Condition: Cognitive Emotional Processing and Reconstruing*

<table>
<thead>
<tr>
<th>Condition</th>
<th>exp (B)</th>
<th>SE</th>
<th>t-ratio</th>
<th>p</th>
</tr>
</thead>
<tbody>
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<td><strong>Cog Emotional Processing</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immersed (intercept)</td>
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<td>0.18</td>
<td>-17.29</td>
<td>&lt;0.001</td>
</tr>
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<td>Concrete</td>
<td>0.76</td>
<td>0.25</td>
<td>-1.10</td>
<td>0.275</td>
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<tr>
<td>Distanced</td>
<td>0.73</td>
<td>0.26</td>
<td>-1.21</td>
<td>0.228</td>
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<td><strong>Reconstruing</strong></td>
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</tr>
<tr>
<td>Immersed (intercept)</td>
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<td>0.05</td>
<td>-17.04</td>
<td>&lt;0.001</td>
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<td>Distanced</td>
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<td>0.12</td>
<td>-1.27</td>
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<td><strong>Insight (subscale of reconstruing)</strong></td>
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<td>Immersed (intercept)</td>
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<td>0.05</td>
<td>-9.75</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Concrete</td>
<td>0.74</td>
<td>0.13</td>
<td>-2.35</td>
<td>0.020</td>
</tr>
<tr>
<td>Distanced</td>
<td>0.77</td>
<td>0.13</td>
<td>-2.10</td>
<td>0.038</td>
</tr>
<tr>
<td><strong>Closure (subscale of reconstruing)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immersed (intercept)</td>
<td>0.24</td>
<td>0.09</td>
<td>-16.66</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Concrete</td>
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<td>0.719</td>
</tr>
<tr>
<td>Distanced</td>
<td>1.09</td>
<td>0.20</td>
<td>0.44</td>
<td>0.658</td>
</tr>
</tbody>
</table>

*Note.* Coefficients for concrete, distanced and distraction groups represent the difference of each respective group (its model-implied mean) from the intercept (the model implied mean for the immersed group). Bold font signifies a significant difference at *p* <0.05.
The current study compared the effectiveness of three emotion regulation strategies in countering ruminative processing and its negative effects in everyday life. In a college-student sample with high levels of trait rumination, participants reported more negative mood when they were asked to analyze a stressful daily event from an immersed perspective than from a distanced perspective or than when they distracted themselves; these findings are consistent with those from previous studies (Broderick, 2005; Kross et al., 2005; Kross & Ayduk, 2008; Wisco & Nolen-Hoeksema, 2010). Concrete analysis was associated with lower levels of negative emotion word use than immersed analysis, but not with lower self-reported negative mood. As predicted, the results of the current study also suggest that distanced analysis may be associated with less blame of others and a tendency to engage in less unproductive, ruminative processing than other strategies, although this latter finding was only a trend. Results also suggest that both distanced and concrete analysis may be associated with more descriptive and less reflective processing than immersion.

This study replicates findings from a number of past studies that suggest that distraction is associated with lower levels of negative mood than focusing on one’s problems and negative emotions (for a review, see Nolen-Hoeksema et al., 2008). Specifically, distraction from thinking about a stressful event was associated with less negative mood than analyzing a stressful event from an immersed, distanced, or
concrete perspective. Although distraction appears to be a potent short-term regulatory tool, overreliance on this strategy can be maladaptive and over time, can be associated with unproductive avoidance of problems and symptoms of psychopathology (Markowitz & Purdon, 2008; Muris et al., 1996; Najmi & Wegner, 2008). The potential negative consequences of using distraction suggest that different strategies are needed for approaching and attempting to solve problems without becoming overwhelmed by negative emotion. Findings from the current study suggest that for high ruminators, adopting a distanced perspective while thinking about stressful daily events and the emotions that accompany them is associated with less negative mood than the immersed perspective. These results corroborate past findings showing that spontaneous self-distancing is associated with lower negative emotional reactivity over time (Ayduk & Kross, 2010). These findings are not surprising given that distancing from one’s thoughts and feelings, or “decentering,” has been hypothesized to be a central mechanism of therapeutic change across multiple treatment modalities (Arch, Wollitzky-Taylor, Eifert & Craske, 2012; Carmody, Baer & Lykins, 2009; Fresco et al., 2007; Hargus et al., 2010). The current study further suggests that distancing might have effects beyond the therapeutic context and might be a potential strategy for countering the harmful effects of rumination in everyday life.

Although concrete analysis of stressful events in this study was associated with somewhat lower negative mood than immersed analysis, this effect was not as strong or consistent as that of distanced analysis or distraction. However, it is important to
keep in mind that participants were asked to think about why they felt certain emotions, rather than solely on what emotions they felt. In most other studies on concrete processing, participants were asked to take an experiential, or “what” focus, on emotions and symptoms (e.g. Moberly & Watkins, 2006; Watkins, Moberly & Moulds, 2008; Werner-Seidler & Moulds, 2012). While some studies have shown successful reductions in negative mood, by instructing participants to focus on the contextual nature of their emotions (Jacoby, Brewin & Watkins, 2008; Watkins, Teasdale & Williams, 2003), it may be that the benefits of concrete processing are lost when participants are explicitly instructed to ask themselves “why” they had certain emotions, even if they are constrained to focus on causes that are situation-specific. Further research may be needed to elucidate when and how concrete processing might be helpful in coping with daily stress.

Analysis of participant narratives revealed significant group differences in thought content. In contrast with hypotheses, the distanced and concrete groups showed higher levels of recounting than the immersed group. An examination of the subscales that constitute recounting revealed that this effect appeared to be driven by a higher level of description (the chain of events and emotions experienced) in both cases. These results are surprising given past findings that distanced analysis is associated with lower levels of recounting than immersed analysis (Ayduk & Kross; 2010; Kross & Ayduk, 2008). However, these past studies did not report separate analyses of the recounting subscales. It is therefore not clear whether these differences were driven by one variable more than the other, or if each variable influenced the
composite equally. In addition, in other studies comparing distanced and immersed analysis, Kross and colleagues have conceptualized descriptions of experiential details as representing “hot” cognitions that can increase negative mood (Kross et al., 2005; Kross & Ayduk, 2008). From this perspective, one would predict distancing to be associated with more “cool” cognitions, and with less description and less blame, which together constitute the recounting variable. However, another line of research suggests that providing concrete and specific experiential details about one’s responses to events is associated with less negative mood than providing less detailed, abstract descriptions (Cribb, Moulds & Carter, 2006; Moberly & Watkins, 2006; Watkins et al., 2008). Our results are more in line with the latter perspective, but further research can clarify these conflicting findings.

Previous studies by Kross and colleagues also were not limited to participants high in trait rumination. It is possible that when those who tend to ruminate employ distancing or concrete processing, they are more able to engage in the task of describing the event without being distracted by a flood of irrelevant details and associations that normally characterize rumination. In this sample, more description might reflect an ability to focus on the task at hand (i.e. to describe the event). Perhaps in line with this hypothesis, results also revealed that those in the distanced group (and not the concrete group) expressed less blame of others in their narratives than those in the immersed group. The distanced group also showed a trend toward less unproductive processing than the immersed group, suggesting that perhaps distancing is associated with less repetitive, intrusive, and unhelpful analysis of problems,
although more research on this relationship is needed. Overall, these findings suggest that distancing in a high ruminative population might allow for higher levels of descriptive focus on the event at hand and less focus on attributing negative aspects of the event to others.

Contrary to our predictions, reconstruing did not differ significantly across groups, although there was a trend towards lower levels of reconstruing in the concrete group compared to the immersed group. Separate examination of the subscales of reconstruing indicated that the immersed group showed significantly higher levels of insight than either the distanced or the concrete group. This result is surprising given past research (Ayduk & Kross, 2010; Kross & Ayduk, 2008) showing that distancing is associated with higher proportions of reconstruing (relative to recounting) than immersion. However, these studies did not report the subscales of reconstruing independently, so it is not clear how the subscales might differ. Further analyses indicated that there were no group differences in the level of closure reached in the narratives, nor in the level of cognitive emotional processing. These findings suggest that while the immersed group expressed more insight statements in their narratives than the other groups, they did not appear to reach higher levels of closure or achieve more significant shifts in perspective. Below is an example of such a narrative from a participant in the immersed condition:

*While I was doing my homework I was stressing out because I couldn't get the answer right. I had a determined mindset of completing and getting a certain score. The crazy thing was that I was had an 89 previously and I needed to get higher than a 90. Even though the one point wouldn't make such a difference, I was making it a bigger deal than it was. I was shouting out words and*
slamming desks. I was actually getting to a point of aggression just because I
couldn't get one more point. I felt like it brought out my competitive nature.
The event made me think real hard about my personality.

This narrative illustrates how a high rating on Kross’s insight subscale of the
reconstruing variable can include self-awareness or insight that is not likely to be
associated with productive processing or closure. This might also reflect what Brewin
and colleagues call “chronic processing,” which is a relentless search for meaning that
does not resolve or move a person to action (Brewin, Dalgleish & Joseph, 1996). It
may be that taking an immersed perspective leads to a greater search for meaning and
insight into stressful events and problems, but not to productive meaning-making or
action to solve problems or to move past unsolvable problems. Indeed, research has
demonstrated that those who have a tendency to ruminate often report that they are
gaining insight into their problems, yet they actually show poorer problem solving and
lower levels of instrumental behavior and social support than those who do not tend to
ruminate (Nolen-Hoeksema et al., 2008). Importantly, Kross’s code of “insight”
captures the degree to which participants describe a realization or change in the way
that they understand their experience/feelings, but it does not specify whether this
change represents a productive shift. It may be that participants in the immersed
condition are expressing higher levels of insight, but that this insight, and the process
by which it is achieved, is not necessarily healthy in nature.

Another consideration for differences in our findings and past findings
comparing immersed and distanced analysis of emotional events is the nature of the
events investigated. Past studies that have compared immersed and distanced analysis
have asked participants to report memories that were particularly high in emotional valence. In addition, these studies did not specify how much time had to have elapsed since the event occurred. It may be that most of the stressful daily events reported in this study were not important enough, or emotionally evocative enough, to require in-depth processing. This might explain why there were no overall differences in reconstruing or in the CHANGE code of cognitive emotional processing. It may be that those in the immersed group were attempting to gain insight into events and feelings that did not require or even warrant high levels of exploration or meaning-making.

The results of this study have important implications for understanding how those who have a tendency to ruminate can productively cope with daily stress. Numerous studies have demonstrated that self-distancing is an effective tool for reducing negative mood in the laboratory, as well as a vital technique in psychotherapy and mindfulness-based stress reduction programs (Baer, 2003; Arch, et al., 2012; Kuyken et al., 2010). However, the current study is one of few, if any, to examine the effects of self-distancing in an at-risk population in their daily lives. The results suggest that self-distancing may be an effective way to reduce the negative effects of ruminative processing that arise with everyday stressors. While distraction may be a quick way to reduce negative mood, it does not allow for analysis of problems or stressors. When productive analysis of an issue is warranted, self-distancing may allow those with a high tendency to ruminate to analyze a problem without being overwhelmed by negative emotions. Concrete analysis may be less
effective than self-distancing at combating the negative effects of rumination. However, further research is needed to explore the efficacy of asking “why” when using a concrete and specific perspective, as was done in this study, versus constraining concrete analysis to experiential recounting, or asking “what.” Merely asking “what” may be associated with less negative mood but asking “why” may be an important step toward problem-solving, which would suggest that a distanced analysis is the most useful strategy for such situations.

**4.1 Limitations and Future Directions**

The current study suggests that distancing, and to a lesser extent concrete analysis, may be an effective way to counter the negative effects of ruminative processing in everyday life. However, the limited range of educational status (mostly undergraduate freshman) and age ($M = 18.97$ years) in this sample may limit generalizability to high ruminators both in and outside of a college context. In addition, we did not examine how self-distancing, distraction, or concrete analysis affected emotion regulation over extended periods of time, or how these types of analysis are associated with psychopathology. In addition, the manipulations in the current study were of much lower intensity than therapeutic interventions or than structured prevention programs. Perhaps direct contact with interventionists and/or longer periods of time devoted to learning and practicing techniques would lead to more striking differences between groups. Past studies also involved oral rather than written instructions on a computer screen. Reading instructions rather than listening to them could be associated lower levels of fidelity to the manipulations or to shallower adoption of these perspectives.
Future studies could aim to teach at-risk participants to use these techniques in a more formal context over the course of weeks or months and subsequently measure the extent to which those participants developed psychopathology. Such studies could provide insight as to whether these techniques could be used as preventative interventions.

Findings were mixed regarding concrete/specific processing of stressful events. Future research should focus on distinguishing the effects of different types of concrete and/or specific processing on mood and rumination. It may be that experiential processing that avoids asking “why” is more effective at reducing negative mood and ruminative thinking than processing that asks “why,” while still focusing on concrete and situation-specific information. The current study also did not specify whether those in the concrete condition should adopt a distanced or an immersed perspective, but results revealed the concrete group to be more similar in their perspective to the latter. It may be that whether or not one uses concrete processing, one's perspective (immersed vs. distanced) is a more powerful determinant of emotional reactivity than level of specificity/concreteness. The current study could not test this hypothesis. However, a past study that examined a similar question (Kross et al., 2005) found that more concrete construals, regardless of perspective, were associated with larger increases in negative emotion than more abstract construals. This finding conflicts with studies that have found the opposite (that abstract processing leads to more negative emotion than concrete processing), but does not conflict with the current study. Future research might clarify how the combination
of construal level and the perspective influences emotional reactivity, as well as which one is more potent.

Lastly, the current study did not provide participants “concreteness training” prior to the study tasks, as was done in some other studies that have reported positive effects of concrete analysis (e.g. Moberly et al., 2008). Such training may be necessary before the beneficial effects of concrete analysis can be fully realized.

4.2 Conclusions

Overall, the findings from this study suggest that both self-distancing and distraction are effective strategies for countering negative emotional reactivity in the daily lives of high ruminators. While distraction seems to be associated with lower levels of negative mood than self-distancing in the short term, distraction may lead to cognitive and emotional avoidance in the long term. Current findings suggest that self-distancing may be associated with higher levels of descriptive focus and less of a focus on blame although further replication of these effects is needed. Concrete analysis may be associated with more descriptive focus than abstract analysis, but it does not appear to be associated with less unproductive, ruminative processing, and may not be associated with reductions in negative mood. Overall, these findings provide further support for distancing as an effective emotion regulation strategy in those with a high tendency to ruminate. Future research should continue to elucidate the differential effects of distancing and concreteness on mood and cognitive processes, as well as to explore how daily use of these emotion regulation strategies contributes to long-term psychological health.
REFERENCES


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The impaired disengagement hypothesis. Clinical Psychology Review, 31(1), 138-145. doi: 10.1016/j.cpr.2010.08.005


Appendix

IRB APPROVAL LETTER
DATE: September 20, 2011

TO: Carly Yasinski, B.A.
FROM: University of Delaware IRB


SUBMISSION TYPE: New Project

ACTION: APPROVED

APPROVAL DATE: September 20, 2011

EXPIRATION DATE: September 19, 2012

REVIEW TYPE: Expedited Review

REVIEW CATEGORY: Expedited review category # 7

Thank you for your submission of New Project materials for this research study. The University of Delaware IRB has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a study design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

This submission has received Expedited Review based on the applicable federal regulation.

Please remember that informed consent is a process beginning with a description of the study and insurance of participant understanding followed by a signed consent form. Informed consent must continue throughout the study via a dialogue between the researcher and research participant. Federal regulations require each participant receive a copy of the signed consent document.

Please note that any revision to previously approved materials must be approved by this office prior to initiation. Please use the appropriate revision forms for this procedure.

All SERIOUS and UNEXPECTED adverse events must be reported to this office. Please use the appropriate adverse event forms for this procedure. All sponsor reporting requirements should also be followed.

Please report all NON-COMPLIANCE issues or COMPLAINTS regarding this study to this office.

Please note that all research records must be retained for a minimum of three years.

Based on the risks, this project requires Continuing Review by this office on an annual basis. Please use the appropriate renewal forms for this procedure.
If you have any questions, please contact Jody-Lynn Berg at (302) 831-1119 or jlberg@udel.edu. Please include your study title and reference number in all correspondence with this office.