

COGNITIVE PROCESSES IN RESPONSE TO PROMOTION AND PREVENTION
FAILURE: A STUDY OF MALADAPTIVE RUMINATION AND ITS AFFECTIVE
CONSEQUENCES

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Dissertation submitted in partial fulfillment of
the requirements for the degree of Doctor
of Philosophy in the Department of
Psychology and Neuroscience in the Graduate School
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Theories of self-regulation have not adequately specified the psychological events and processes that cause an emotional response following acute failure to be prolonged and intensified. Research on repetitive thought suggests that engaging maladaptive rumination can prolong and intensify existing mood states. However, theories of rumination have not incorporated the implications of failing to attain different types of desired end states for rumination, that is, failing to attain goals associated with nurturance and advancement (i.e., promotion goals) versus goals associated with safety and security (i.e., prevention goals). In this investigation, 78 graduate and professional students participated in a within-subjects experimental design testing the overall hypothesis that exposure to past failures to attain promotion and prevention goals will promote maladaptive rumination on dejection- and agitation-related emotions, respectively. Furthermore, under conditions of high negative affect engaging in maladaptive rumination will cause the specific type of negative affect experienced to be intensified and prolonged. Study findings did not result in clear support for the proposed model in the prevention condition. The prevention manipulation failed to induce agitation-related emotions associated with anxiety and instead appeared to induce emotions associated with anger. The prevention condition also did not result in unique changes in quiescence. However, as predicted, decreases in

quiescence uniquely predicted increased engagement in maladaptive rumination. In this condition, engagement in rumination did not interact with low levels of quiescence to prolong and further decrease quiescence. Stronger support was found for the proposed model in the promotion condition. Individuals with chronic promotion failure experienced significant increases in dejection following exposure to past promotion failures. The level of dejection experienced significantly predicted engaging in greater maladaptive rumination. Furthermore, engaging in maladaptive rumination in the presence of high levels of dejection intensified and prolonged of the experience of dejection-related emotions. Overall, the results suggest that self-regulatory cognition, the type and magnitude of negative affect that results, and variability in the tendency to engage in maladaptive rumination all play a significant role in determining a person's cognitive and emotional experiences in the ongoing process of self-regulation.

DEDICATION

This work is dedicated to the loving memory of my great aunt Claudine Ernesta Cadogan who taught me to read and write. This work is also dedicated to my parents, and brothers who instilled in me the firm belief that that anything is possible with direction, dedication, and perseverance. Without their tireless support, this work would not exist.

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LIST OF SYMBOLS AND ABBREVIATIONS

Adj.	Adjusted
BDI	Beck Depression Inventory
CS	Computerized Selves Questionnaire
ELOT	Extended Life Orientation Test
LIWC	Linguistic Inquiry and Work Count
PANAS-X	Positive and Negative Affect Scale – Expanded Form
RFT	Regulatory Focus Theory
RRQ	Rumination and Reflection Questionnaire
S.I. Self-Awareness	State Internal Self-Awareness
SDT	Self-Discrepancy Theory
SPrSc	State Private Self Consciousness
STAI	State Trait Anxiety Inventory
T1	Baseline Measure of Mood
T2	Post-Writing Measure of Mood
T3	Post-Meditation Measure of Mood

ACKNOWLEDGEMENTS

I would like to offer my heart felt thanks to Timothy J. Strauman, for his willingness to let me explore and develop my own research interests. I would like to thank him for believing in my ideas and his tireless support of my research endeavors over the last six years. In addition, I would like to thank him for providing an example of what a mentor should be - I will never forget his dedication, selflessness, and caring. I would also like to offer thanks to my committee members, Tanya Chartrand, Phil Costanzo, and Rick Holye, for their guidance and support during this two year journey.

Thank you to the members of the Strauman Lab (Ann Aspnes, Madeline Carrig, Lori Kwapil, Megan McCrudden, Amy Noll McLean, Kari Merrill, Alison A. Papadakis, and Angie Vieth) for being such a supportive and understanding team during the stress of this entire process. Special thanks to Lori Kwapil for helping with the logistics of paying subjects. This work would also not have been possible if it were not for the guidance and support of Alison Papadakis. I would like to thank her for taking me under her wing at the beginning of my graduate career and for keeping me sane during graduate school.

I would also like to acknowledge the amazing work of all of the undergraduate research assistants who made this research happen by programming the experiment, recruiting subjects, conducting the experiment, and managing data. Without your

assistance the data not have been collected in time. Thank you to Caitlin Hogan, Christine Dyott, Chelsea Luse, Rebecca Parrish, Heather Williams, Margaret Chambers, Laurel Donaldson, Katya Fernandez, Vitoria Krone, and Iza Wojciechowska.

I would also like to thank the Duke Interdisciplinary Initiative in Social Psychology (DIISP) for providing the funds to pay participants and the lab facilities. Lastly, I would like to thank my fellow graduate and professional students for taking the time out of their busy schedules to participate in this research project.

INTRODUCTION

Self-regulation researchers have worked to clarify the “processes, internal and/or transactional, that enable an individual to guide his\her goal-directed activities over time and across changing circumstances” (Karoly, 1993, p. 25). Theories of self-regulation, such as control theory (Carver & Scheier, 1981, 1990, 1998, 1999), self-discrepancy theory (SDT; Higgins, 1987), and its elaboration into regulatory focus theory (RFT; Higgins, 1996, 1997, 1998) have provided rich and useful contributions to our understanding of self-regulation.

One of the major contributions of these theories is that they offer explanations regarding how specific negative affective states are generated in response to a discrepancy between a person’s self-concept and specific self-definitional goals (i.e., unsuccessful self-regulation; Carver & Scheier, 1981, 1990, 1998, 1999; Higgins, 1987, 1996, 1997, 1998). According to SDT and RFT, self-regulation using strategic approach to fulfill nurturance needs (i.e., promotion focus) generates emotions on the elation-dysphoric dimension, whereas self-regulation using strategic avoidance to fulfill goals associated with safety and security (i.e., prevention focus) generates emotions on the quiescence-agitation dimension (Higgins, Bond, Klein, & Strauman, 1986; Higgins, Klein, & Strauman; 1985; Strauman & Higgins, 1987, 1988; Strauman, 1989; Higgins, 1987; 1997). Furthermore, research on RFT and SDT suggests that the presence of chronic

discrepancies between different aspects of the self represents a vulnerability factor for the development and maintenance of depression and/or anxiety disorders (Higgins, 1997; Pyszczynski & Greenberg, 1987; Strauman, 2002). However, in their current forms, SDT and RFT do not specify completely the psychological events and processes that cause an emotional response following acute failure to be prolonged and intensified.

An abundance of research indicates that engaging in maladaptive rumination in the presence of negative mood both prolongs and intensifies the experience of negative affect (Thomsen, 2006). To date no single conceptualization of rumination is agreed upon (Harrington & Blankenship, 2002; Papageorgiou & Wells, 2004; Siegle, Moore, & Thase, 2004; Thomsen, 2006). One of the most influential theories of rumination was proposed by Nolen-Hoeksema and colleagues (e.g. Nolen-Hoeksema, 1991, 2000; Nolen-Hoeksema & Morrow, 1991; Nolen-Hoeksema, Morrow, & Fredrickson, 1993). In their theoretical framework, rumination is defined as “thoughts and behaviors that focus the depressed individual’s attention on his or her symptoms and the possible causes and consequences of those symptoms” (Nolen-Hoeksema et al., 1993, p. 20). In this account, rumination is a maladaptive method of coping with depressed mood. Numerous studies indicate that dysphoric individuals induced to ruminate demonstrate greater pessimism, lower self-confidence, and a reduced ability to generate effective solutions to interpersonal problems (Lyubomirsky & Nolen-Hoeksema, 1995; Lyubomirsky, Tucker, Caldwell, & Berg, 1999; Ward, Lyubomirsky, & Nolen-Hoeksema, 2003). Deficits in these

areas have also been linked to unsuccessful self-regulation (Karoly, 1993; Carver & Scheier, 1981, 1990, 1998, 1999).

Broader conceptualizations of rumination have also been posited in an attempt to clarify the causes and functions of engaging in repetitive thought – that is, the tendency to think attentively, repetitively, or frequently about oneself and one’s world (Martin & Tesser, 1989, 1996, 2006; Segerstrom, Stanton, Alden, & Shortridge, 2003). Martin and Tesser’s (1989, 1996, 2006) goal progress theory of rumination provides a broad and comprehensive account of repetitive thought processes, such as worry (Roemer & Borkovec, 1993), regret (Landman, 1987), daydreaming (Singer, 1966), and counterfactual thinking (Roese, 1997). Using a self-regulatory framework, Martin and Tesser (1989, 1996, 2006) posited that ruminative thoughts occur as a manifestation of individuals’ tendency to persist in goal-directed action, until they have either attained a goal or given up a desire for it (cf. Carver & Scheier, 1981, 1990, 1998; Zeigarnik, 1927/1938). In this model, rumination is instigated by a discrepancy between a person’s actual state and a desired end-state as well as the degree of perceived progress toward a desired end-state. The thoughts reoccur because of direct and indirect cueing of an important goal by stimuli in the environment or by internal cues. Evidence suggests that perceived lack of progress in relation to a person’s ongoing goal pursuits can generate negative affect, disrupt a person’s sense of self, as well as promote internal conflict and

uncertainty regarding how to respond – resulting in rumination (Brunstein & Gollwitzer, 1996; Emmons & King, 1988; Lavalley & Campbell, 1995).

While elegant and comprehensive, Martin and Tesser's theory does not articulate the implications of failing to attain different types of desired end-states for rumination (i.e. failing to attain promotion versus prevention goals), and in addition, was not constructed to take into account differences in motivational state, affect, and strategies when the individual is engaged in a promotion versus prevention focus (based on individual differences or features of the situation). In fact, some evidence suggests that unsuccessful promotion and prevention failure are related to engaging in the particular forms of counterfactual thinking (Roese, Hur, & Pennington, 1999) which are considered a subset of ruminative thoughts (Martin & Tesser, 1996; Roese, 1997). Specifically, when processing promotion failure, individuals are likely to engage in "what if thinking" that focuses on identifying alternate behaviors they could have engaged in that could have positively changed the outcome (additive counterfactuals). In contrast, participants processing prevention failure engage in "what if thinking" that focuses on identifying behaviors that they should not have engaged in that could have positively change the outcome (subtractive counterfactuals). Other researchers have also suggested that one of the possible benefits of taking these differences into consideration is that doing so has the potential to clarify why repetitive thought processes are related to both anxiety and depression (Seegerstrom, Tsao, Alden, & Craske, 2000).

In this investigation, I used an experimental design to test the overall hypothesis that exposure to past failures to attain promotion and prevention goals will promote maladaptive rumination on dejection- and agitation-related emotions, respectively. Furthermore, under conditions of high negative affect, engaging in maladaptive rumination will cause the specific type of negative affect experienced to be intensified and prolonged. In this investigation, maladaptive rumination is defined as “a class of conscious thoughts that revolve around a common instrumental theme and recur in the absence of immediate environmental demands requiring the thoughts” (Martin & Tesser, 1996, p. 7); the thoughts occur “unexpectedly and automatically dominate ... awareness to the point where they become noticeable and bothersome” (Gold & Wegner, 1995); and the thoughts occur “...without progression toward choice of a solution and a commitment to that solution” (Nolen-Hoeksema, 1996, p. 137).

Self-Regulation and its Motivational and Affective Consequences

In the current study, self-discrepancy theory (SDT; Higgins, 1987) and its elaboration into regulatory focus theory (RFT; Higgins, 1996, 1997, 1998) were used to specify the different types and qualities of self-discrepancies that induce dejection-related and agitation-related emotions. SDT specifies three domains of the self that can be evaluated from one’s own viewpoint: (a) the actual self, which refers to the attributes that a person believes s/he actually possess; (b) the ideal self, which refers to the

attributes that a person believes s/he would ideally like to possess (i.e., a person's hopes, wishes, or aspirations); and (c) the ought self, which refers to the attributes that a person believes s/he should or ought to possess (i.e., a person's duties, obligations, or responsibilities).

The actual self has often been referred to as self-concept (see Wylie, 1979), whereas the ideal and ought self-states are conceptualized as self-definitional goals that guide behavior (self-guides). SDT postulates that individuals are motivated to reach a condition where the actual self-state matches personally relevant self-definitional goals. The concept of matching to a standard/goal has a long tradition in motivational theories (see Carver & Sheier, 1981, 1990, 1998, 1999; Duval & Wicklund, 1972; Miller, Galanter, & Pribram, 1960; Wiener, 1948). SDT differs from these theories by specifying that acute or chronic discrepancies between self-states and specific self-guides are associated with different motivational predispositions and emotional reactions.

Each type of actual-self/self-guide discrepancy generates specific negative psychological situations (Lewin, 1935) that influence motivational and emotional reactions. Two basic forms of negative psychological situations discussed by Higgins are (1) the absence of positive outcomes, which is associated with dejection-related emotions, and (2) the presence of negative outcomes, which is associated with agitation-related emotions. An actual/ideal discrepancy signals that one's current state does not match one's hopes, wishes, or desires. This perception is associated with the negative

psychological situation representing the absence of positive outcomes, which is associated with dejection-related emotions. Specifically, an actual/ideal discrepancy leads to disappointment, dissatisfaction, and frustration resulting from unfulfilled desires. In contrast, actual/ought discrepancy is related to the presence of negative outcomes due to the perception that one has failed to live up to one's own sense of duties and obligations. Specifically, an actual/ought discrepancy is associated with guilt, self-contempt, and uneasiness in addition to feelings of moral worthlessness or weakness. In addition, actual/ought discrepancy is also associated with fear and feeling threatened because harm is anticipated or impending as well as secondary anger resulting from the experience of being shamed or feeling guilty (Tangney, Wagner, Fletcher, & Gramzow, 1992).

SDT specifies that self-discrepancies are not equally active or equally likely to induce discomfort. In order to determine the type(s) of discrepancy to which a person is vulnerable, both the magnitude and accessibility of the self-discrepancy must be considered. The magnitude of a discrepancy is the extent to which the self-concept and the self-definitional goal in question diverge within a person. The greater the magnitude of the discrepancy, the greater the intensity of the associated discomfort when it is activated. The accessibility of a discrepancy is the likelihood that a discrepancy will be activated. Accessibility is influenced by factors such as how recently the discrepancy has been activated, how frequently it is activated, and how applicable the discrepancy is

to an event. SDT assumes that self-discrepancies need not be held in conscious awareness to be used to assign meaning to events (see Bargh, 1984, Bargh, Bond, Lombardi, & Tota, 1986; Bargh & Chartrand, 1999; Shah, 2005).

Both correlational (Higgins et al., 1985; Strauman & Higgins, 1988) and experimental (Higgins et al., 1986; Strauman & Higgins, 1987; Strauman, 1989) studies support the hypothesized links between self-discrepancies and specific kinds of negative affect, as well as between specific self-discrepancies and particular psychological symptoms. Several research groups (e.g., Carver, Lawrence, & Scheier, 1999; Bruch, Rivet, & Laurenti, 2000; Hankin, Roberts, & Gotlib, 1997; Scott & O'Hara, 1993; Strauman, 1992) have found that chronic actual/ideal discrepancy is specifically related to depression, whereas chronic actual/ought discrepancy is specifically related to anxiety.

RFT (Higgins, 1996, 1997, 1998) extends SDT by positing that there are distinct orientations to approaching desired end-states (e.g., ideal self-guides). Temperament-based and social-cognitive models of approach and avoidance (e.g., Carver & Scheier, 1990, 1998; Gray, 1982) have treated approaching "reward" and "approaching non-punishment" as equivalent. In contrast, regulatory focus theory posits that self-regulation of behavior that is concerned with nurturance-related versus security-related needs differ in regulatory focus.

RFT discriminates between self-regulation with respect to a promotion focus versus a prevention focus. Promotion focused self-regulation represents a concern with advancement, growth, and accomplishment that is induced by nurturance needs, strong ideals (i.e., strong aspirations, and hopes for oneself), and situations that are framed in terms of the presence or absence of positive outcomes (gain/non-gain). Promotion focused self-regulation involves sensitivity to the absence or presence of positive outcomes, approach as a strategy for attaining desired end-states, and an eagerness for advancement and gains (i.e. maximizing attainment, and ensuring against missed opportunities for attainment). This type of self-regulation can be described as attaining a positive end-state by “making good things happen.”

In contrast, prevention focused self-regulation represents a concern with protection, safety, and responsibility that is induced by security needs, strong oughts (i.e., a strong sense of one’s duties and responsibilities), and situations framed in terms of the presence or absence of negative outcomes (loss/non-loss). Prevention focused self-regulation involves a sensitivity to the presence or absence of negative outcomes, avoidance as a strategy for attaining desired end-states, and vigilance to ensure safety and non-loss (i.e. vigilance against making mistakes, and insuring against committing the error of producing them). This type of self-regulation can be described as attaining a desired end-state by “keeping bad things from happening”.

RFT specifies that individuals can differ in their chronic promotion focus and chronic prevention focus; differences in regulatory focus can arise from differences in the quality of parental involvement during childhood (see Higgins & Silberman, 1998). A parental history of protection and using punishment as discipline induces a strong sense of one's duties and responsibilities and concern with safety and security (i.e., a prevention focus). In contrast, parenting characterized by encouraging accomplishments and withdrawing love as discipline induces strong aspirations and hopes for oneself, and concerns with accomplishments and advancement (i.e., a promotion focus; see Boldero, Roney, Francis, Strauman, & Higgins, 2005; Higgins & Silberman, 1998; Manian, Papadakis, Strauman, & Essex, 2006; Manian, Strauman, & Denney, 1998; Strauman, 1996).

RFT incorporates SDT's explanations regarding the generation of negative affect. Specifically, RFT incorporates the assertion that affect is caused by a discrepancy between specific self-state/self-guides and that the intensity of the emotional reaction depends on the magnitude and accessibility of the self-guide in question. The theory posits that successful self-regulation in a promotion focus (i.e., congruency or match with ideal self-guide – promotion success) represents the presence of positive outcomes, resulting in the experience of cheerfulness-related emotions (e.g. elation). In contrast, unsuccessful self-regulation in a promotion focus (i.e., mismatch with ideal-self guide - promotion failure) represents the absence of positive outcomes, resulting in the

experience of dejection-related emotions (e.g., sadness). Furthermore, successful self-regulation in a prevention focus (i.e., congruency with the ought self-guide - prevention success) represents the absence of a negative outcome, resulting in the experience of quiescence-related emotions (e.g., relief or contentment). In contrast, unsuccessful self-regulation in a prevention focus (i.e. a mismatch with the ought self-guide – prevention failure) represents the presence of a negative outcome, resulting in the experience of agitation-related emotions (e.g., anxiety, anger). An impressive body of literature has examined the predictions made by RFT (see Boldero et al., 2005, for a comprehensive review).

Most experimental studies of SDT and RFT have used ‘priming’ techniques in which participants are incidentally exposed to her/his own promotion or prevention goals or are induced to be in a temporary promotion or prevention focus by framing a task in terms of gain/non-gain or loss/non-loss (e.g., Roese et al., 1999). In the current study, promotion and prevention goals (specifically, ideal and ought guides) were identified by a computerized questionnaire (Shah & Higgins, 2001) given one week prior to engaging in the experimental phase of the investigation. The ideal and ought guides were chosen based on participant’s report that he/she was failing to attain a particular self-definitional goal (e.g., “successful”, “reliable”, “generous”, “attractive”). In addition, in order to amplify the effect of the priming in the active conditions, participants were explicitly asked to recall three past-situations where they had failed to attain their own

promotion and prevention goals. Furthermore, in this study the prompts used to expose subjects were also framed to specifically induce negative psychological situations associated with the absence of a positive outcome or the presence of a negative outcome. Presenting a participant with a promotion or prevention goal that is discrepant with their actual self is a reliable idiographic technique for exposing the participant to personally relevant failure feedback in order to observe the consequences of such feedback (e.g., Strauman, Lemieux, & Coe, 1993).

In summary, based on SDT and RFT, I predicted that increasing the accessibility of past failures to attain promotion goals will cause individuals who possess significant chronic promotion failure to experience increases in dejection-related emotions and decreases in elation-related emotions. In contrast, increasing the accessibility of past failures to attain prevention goals will cause individuals who possess significant chronic prevention failure to experience increases in agitation-related emotions and decreases in quiescence-related emotions. In addition to the specific affective consequences of unsuccessful self-regulation, I predicted that priming of self-discrepancies and the distress that resulted would cause individuals to begin to engage in repetitive thought, based on Martin and Tesser's (1989, 1996, 2006) goal progress theory of rumination.

Causes and Consequences of Ruminative Thought

Martin and Tesser (1989, 1996, 2006) proposed a goal progress theory of rumination, in which they used the term to refer to several generic types of repetitive thought, for example, problem-solving, worry, and regret. Martin & Tesser (1996) proposed the following definition of rumination:

Rumination is a class of conscious thoughts that revolve around a common instrumental theme and that recur in the absence of immediate environmental demands requiring the thoughts. Although the occurrence of these thoughts does not depend on direct cueing of the environment, indirect cueing by the environment is likely given the high accessibility of goal-related concepts. Although the external environment may maintain any thought through repeated cueing, the maintenance of ruminative thoughts is not dependent on such cueing (p. 7).

As stated previously, in this model rumination is instigated by a goal discrepancy. The thoughts reoccur because of direct and indirect cueing of an important goal by stimuli in the environment or by internal cues. The likelihood that a goal will be activated by internal or environmental stimuli depends on the goal's importance. The importance of the goal is believed to be linked to the consequences of not attaining the goal – the more serious the consequences, the greater the goal's priority the more likely it is to be activated (Klinger, 1977).

The theory specifies that not all difficulties in attaining goals lead to rumination. Individuals are more likely to ruminate about goals higher in the person's hierarchy of

goals (i.e., those goals that are more general, cross-situational, and motivationally significant) because those goals are more likely to be tied to a person's well-being (Beck, 1982; McIntosh & Martin, 1992). For example, a person is more likely to ruminate following the realization that his/her goal of getting into medical school is threatened than he/she is at failing a single quiz in Calculus. However, due to the fact that the achievement of higher order goals is linked to the attainment of lower order goals, failure to attain lower order goals may also instigate rumination to the extent that particular goal is associated with higher order goals. For example, the student who is trying to get into medical school may begin to ruminate if he/she fails Organic Chemistry, which is directly linked to fulfilling requirements for medical school. In addition, small interferences with goal progress are predicted to generate rumination at lower levels in the hierarchy and large interferences cause rumination at higher levels in the hierarchy. Furthermore, successive failures at attaining lower order goals can combine to make the non-attainment of a higher order goal salient. For example, receiving four bad quiz grades during the same day may cause a person to conclude that s/he may not be qualified to go medical school, which may be linked to failing to attain the higher order goal of being an intelligent person.

In the current study, promotion and prevention goals are conceptualized to exist at the highest level in a person's goal hierarchy, that is, as systems concepts (Carver & Scheier 1981, 1990, 1998, 1999; Powers, 1973). Specifically, four levels in a goal hierarchy

have been articulated beginning with *systems* concepts at the top of the hierarchy, followed by *principles*, *programs*, and *sequences*. Systems concepts refer to broad personal constructs such as an idealized sense of self or ought sense of self. This sense of self may be comprised of several principles, such as ‘be rational’ and ‘be intelligent’ (i.e., promotion or prevention goals; ideal or ought guides). To enact these principles, *programs* of behavior may exist, for example, ‘do not show intense emotion when talking to a friend,’ or ‘study hard.’ In turn, in order to enact programs, individuals may use specific *sequences* of action, such as, ‘contracting eye muscles to prevent crying.’ This organization of goals implies that the higher up in the hierarchy, the more abstract the goal and the more likely it constitutes a core aspect of the self. In this regard, it is interesting to note that Eddington and colleagues (Eddington, Dolcos, Cabeza, Krishnan, & Strauman, 2007) observed that priming promotion goals led to activation in the anterior frontal cortex, a brain region associated with “integrating outcomes across separate cognitive operations in the pursuit of abstract, higher-order goals” (Ramnani & Owen, 2004).

According to the goal progress theory of ruminative thoughts, rumination can be terminated by attaining the goal or disengaging from the blocked goal both physically and psychologically. However, redirecting thoughts away from the distressing content or reducing negative affect associated with the goal blockage is likely to only temporarily halt the process. Such strategies are only temporary “fixes” because the

continual cueing of goal-related thoughts by features of the social environment or the experienced distress make continued distraction extremely difficult (Martin & Tesser, 1996). The theory also specifies that over time a process referred to as channelization can occur which refers to the development of a strong associative network in memory related to the recurrent thought that can cause the thought to be triggered even if the goal has been attained.

According to the theory, rumination does not necessarily generate affect; rather, the same factors that can cause affect also cause rumination. Following the lead of Wyer and Srull (1989), Martin and Tesser (1996) agreed that the intensity of the affect a person experiences when a goal is challenged is related to the importance of a goal, the relationship of the goal to the attainment of higher order goals, and the amount of time and energy expended to reduce the discrepancy. Klinger (1977) stated that these are the very reasons why individuals also engage in rumination about their current concerns. However, the theory posits that rumination can directly influence the generation of affect through secondary appraisals (Lazarus & Folkman, 1984) of the experience of rumination (i.e., metacognitions). After ruminating for some time, individuals may become distressed by the fact that they feel as if they cannot control their thoughts. Similarly, Wells and Matthews' Self-Regulatory Executive Function model (Wells, 2000; Wells & Matthews, 1994) proposed that metacognitive beliefs are linked to rumination in depression. Wells and Matthew suggested that once rumination is activated, individuals

appraise the process as uncontrollable, harmful, and likely to produce detrimental interpersonal as well as social consequences (e.g., “people will reject me if I ruminate”). Research has demonstrated that these beliefs partially mediate the association between rumination and depression (Papageorgiou & Wells, 2003, 2004).

In addition, rumination is predicted to maintain or polarize feelings already present (Tesser, 1978; Tesser, Martin, & Mendolia, 1995). Martin and Tesser (1996) posit that affect can cause rumination to the degree that it alters perceptions related to goal progress; this assertion is consistent with mood-as-information theory (see Schwarz & Clore, 1983, 2003). The presence of negative affect is more likely to be associated with the inference that one is not making progress towards one’s goals. In contrast, positive affect is more likely to be associated with the inference that one is making progress towards one’s goals.

According to the goal progress theory (Martin & Tesser, 1989, 1996, 2006) individual differences also play a role in determining who engages in rumination. The tendency to engage in rumination depends on an individual’s tendency to link attainment of lower order goals to the attainment of higher order goals. The more an individual links lower order goals to higher order goals, the more likely s/he will experience greater levels of rumination in response to a discrepancy. In addition, the individual’s ability to identify, generate, and enact multiple means (i.e., alternate pathways) of attaining a higher order goal also influences the degree of rumination.

Identification or generation of fewer pathways and a reduced capability to enact alternate means leads to increased rumination. Furthermore, individual differences in the extent to which persons are able to disengage from the goal also influence the degree of rumination. An inability to disengage from unattainable goals is related to an increase in rumination.

Following the frustration of an important goal, a person is postulated to engage in the following sequence of behaviors: repetition of the initial instrumental behavior, expectancy evaluation, problem solving, end-state thinking, negotiation for goal abandonment, and “learned helplessness” (Carver & Scheier, 1981, 1990, 1998, 1999; Martin & Tesser, 1989). Martin and Tesser suggested that the first stage is to simply repeat the same instrumental behavior with greater persistence. The greater the frustration, the more effort will be placed into enacting the response, which may decrease the ability to choose another instrumental response and increase the degree of negative affect felt if the response is met with failure.

Following failure, an expectancy evaluation occurs that is based in part on memories of prior outcomes in similar situations, identification of additional resources, and consideration of alternative approaches for goal attainment (Carver & Scheier, 1981, 1990, 1998, 1999). The review of this information may also generate positive or negative affect, which contributes to an overall optimistic or pessimistic appraisal of attaining the outcome. If the evaluation yield optimism and alternate means are available to attain a

desired end state, rumination will not occur (Martin & Tesser, 1989). As the number of alternate means decreases, the degree of rumination and level of pessimism both increase (Millar, Tesser, & Millar, 1988). Failure can also lead to redefining the goal at a lower level in the goal hierarchy. However, this strategy can eventually lead to a narrowing of alternatives to reaching the original goal and may lead to a removal of the original goal as a behavioral guide (thus making it more difficult to attain). In addition, individuals can become fixated on the lower order goal, which may result in an inability to disengage from the goal when opportunities for its attainment have passed. Alternately, individuals may disengage from goals prematurely because it may not be possible to justify high degrees of effort at a lower order goal after losing sight of the higher order goal. Furthermore, the ruminative search for instrumental behaviors can lead to an active questioning of a person's sense of self (goals at the very top of the hierarchy), which in turn might lead to self-redefinition (Wicklund, 1986).

An individual who fails to identify alternate means or cannot engage in self-redefinition will cease to try to identify alternate pathways but will continue to ruminate about the goal and the feelings associated with not attaining the goal (i.e., "end-state thinking"). Engaging in end-state thinking is predicted to have a polarizing effect on existing feelings, such that feelings that are initially negative become more negative (Tesser, 1976; Millar & Tesser, 1986). End-state thinking is characterized by non-

instrumental thoughts that are maladaptive and accompanied by a strong emotional response to failure.

Following end-state thinking, the individual is postulated to enter a negotiation phase where the person may disengage from the goal and reengage in an alternate goal. Successful disengagement and reengagement will reduce the drive to attain the previously identified end-state and thus cease rumination (Heckhausen, Worsch, & Fleeson, 2001; Worsch & Heckhausen, 1999; Worsch, Scheier, Carver, & Schulz, 2003).

However, given the centrality of a particular goal to a person's sense of self (especially in the case of promotion/prevention goals), it may not be possible to disengage from the goal despite having a pessimistic appraisal that it cannot be attained. Failure to disengage from or modify the goal is predicted to lead to the experience of maladaptive rumination (end-stage thinking) in which the individual is plagued by self-doubt and perceptions of inadequacy (Martin & Tesser, 1996; Pyszczynski & Greenberg, 1987).

As a recent summary of the literature concluded, research clearly demonstrates that relative to engaging in distraction, rumination does increase sad mood (Thomsen, 2006) if individuals are already experiencing significant levels of sad mood (i.e., for participants classified as dysphoric). Similar conclusions were drawn by Siegle and colleagues (2004) in a study examining how different populations (non-depressed adults, clinically depressed, and non-depressed adults with Systemic Lupus Erythematosus) responded on multiple measures of rumination. Siegle et al. (2004)

concluded that whether or not a person engages in rumination depends on the level of dysphoria experienced. Only a minority of experimental studies have actually assessed the effect of rumination alone (not relative to distraction) on before-after levels of sadness (Joorman & Siemer, 2004; Katz & Bertelson, 1993; Lavender & Watkins, 2004, Nolen-Hoeksema & Morrow, 1993; Trask & Sigmon, 1999; Watkins & Teasdale, 2004). Of these studies, only two observed that rumination significantly intensified sad mood (Lavender & Watkins, 2004, Nolen-Hoeksema & Morrow, 1993).

Similarly, the review concluded that across cross-sectional, longitudinal, and experimental studies there is a relation between rumination and anxiety (Thomsen, 2006). However, very few experimental studies have been conducted to examine the intensification and prolonging effects of rumination on anxiety, which have resulted in mixed results (Blagden & Craske, 1996; Thomsen, Jorgensen, Mehlsen, & Zachariae, 2004; Vickers, & Vogeltanz-Holm, 2003; Young & Nolen-Hoeksema, 2001). For example, Young and Nolen-Hoeksema (2001) failed to detect differences between high and low ruminators on the secretion of anxiety related neuroendocrine responses. However, in two studies rumination did predict intensifications in anxiety (Thomsen et al., 2004, Vickers, & Vogeltanz-Holm, 2003), whereas in another, levels of anxiety were found to be prolonged, but did not increase as a result of ruminating (Blagden & Craske, 1996).

To summarize, the results from current experimental findings support several aspects of Martin and Tesser's (1989, 1996, 2006) goal progress theory of rumination.

Specifically, failure to make progress toward important goals has been demonstrated to cause negative affect, self-concept confusion, and rumination (Brunstein & Gollwitzer, 1996; Lavalley & Campbell, 1995). In addition, an inability to resolve internal conflict regarding goals can also lead to inaction and rumination (Emmons & King, 1988). Furthermore, engaging in rumination intensifies and prolongs the experience of sadness and depressive symptoms, depending on a person's initial level of dysphoria (Thomsen, 2004). However, the results regarding rumination's impact on prolonging and intensifying anxiety are less clear (Thomsen, 2004).

To date, no identified empirical investigation has combined theories of ruminative thought with RFT and SDT, which provide specific predictions regarding self-regulatory failure and the experience of agitation- and dejection- related emotions. I proposed combining SDT and RFT (Higgins, 1987, 1996, 1997) with existing theories of repetitive thought results in the following predicted sequence of events for unsuccessful promotion and prevention self-regulation. Failure to attain promotion goals associated with advancement, growth, and accomplishment signals that strategically an individual has missed an opportunity to attain a desired outcome. This results in the absence of the positive outcome and yields both dejection-related emotions and repetitive thought processes (e.g., additive counterfactual thinking, or problem-solving). If the individual fails to identify alternate means for attainment or cannot modify their promotion goals s/he will cease to try to identify alternate pathways and begin to engage in maladaptive

rumination plagued with self-doubt. Engaging in maladaptive rumination in the presence of high levels of dejection will result in a polarization and prolonging of that emotion.

In contrast, failure to attain prevention goals associated with safety, security and protection signals that strategically they have failed to avoid making an error. This results in the presence of a negative outcome and yields both agitation-related emotions and repetitive thought (e.g., subtractive counterfactual thinking, or problem-solving). If the individual fails to identify alternate means for attainment or cannot modify their prevention goals s/he will cease to try to identify alternate pathways for attainment and engage in maladaptive rumination plagued with self-doubt. Engaging in maladaptive rumination in the presence of high levels of agitation causes a polarization and prolonging of that acute emotional experience.

The current investigation focused specifically on testing aspects of this combined model to provide greater clarity regarding the process of self-regulation and the social-cognitive processes involved in intensifying and prolonging acute emotional states. I also sought to provide greater clarity to the repetitive thought literature by specifying the conditions under which repetitive thought is related to both agitation- and dejection-related emotions, such as anxiety and depression (Seegerstrom et al., 2000). To accomplish these goals, I investigated the affective consequences of engaging in maladaptive rumination in response to unsuccessful promotion and prevention self-

regulation. Maladaptive rumination was predicted to result in continued activation of a perceived discrepancy between the current state of being and the chosen goal, causing the goal to remain salient (Martin & Tesser, 1996). This begins a cyclic process where continued indirect and direct cueing of the discrepancy generate more intense negative affect and increasing levels of maladaptive rumination. I predicted that the affective state prior to and during maladaptive rumination depends on whether or not individuals are regulating with respect to promotion or prevention goals. If the individual is failing to attain a promotion goal, the affective emotional state will be one of dejection; in contrast, failing to attain a prevention goal will cause the individual to experience agitation. Furthermore, I hypothesized that engaging in maladaptive rumination in response to high levels of negative affect (signaling a large discrepancy) would prolong the experience of agitation or dejection generated from promotion and prevention failure. In this state of rumination, the individual is no longer actively producing solution strategies but is still likely to be thinking about the goal object and his/her feelings regarding the object. Thinking characterized in this way is predicted to cause the polarization of existing negative affect states, intensifying the affective experience (Martin & Tesser, 1989). The following design was used to test this combined model of self-regulatory cognition following failure feedback.

Design and Hypotheses

A multi-session within-subject experimental design was used to examine the affective consequences of engaging in maladaptive rumination in response to priming of promotion and prevention failure. The study was conducted in a volunteer sample consisting of graduate/professional students with a range of self-reported depressive and anxious symptoms. During Session 1, participants completed a set of computerized questionnaires assessing perceived success/failure in pursuing promotion and prevention goals, as well as measures of pessimism and the tendency to engage in rumination, along with baseline measures of depressive and anxious symptoms. Approximately one week later, in a series of sessions on successive days (Sessions 2-4), baseline ratings of mood were assessed, and then participants were exposed to personal goals as a means of inducing specific negative affective states (consistent with SDT and RFT) and self-regulatory cognition. Immediately being exposed to their goals, participants gave a second mood rating and engage in a mindfulness meditation exercise that provided an uninterrupted period allowing naturally occurring maladaptive rumination to manifest. Immediately following the meditation exercise, participants provided another mood rating and also rated the degree to which they experienced maladaptive rumination during the meditation period.

Four hypotheses were tested. First, it was predicted that exposure to self-definitional failure feedback would be associated with predictable changes in mood. Specifically, increasing the accessibility of past failures to attain promotion goals would cause individuals who possess significant chronic promotion failure to experience increases in dejection-related emotions and decreases in elation-related emotions, compared to a control-feedback condition. In contrast, increasing the accessibility of past failures to attain prevention goals would cause individuals who possess significant chronic prevention failure to experience increases in agitation-related emotions and decreases in quiescence-related emotions, again compared to a control-feedback condition. This hypothesis was intended as a replication of findings from previous SDT priming studies that would allow the present findings to be compared meaningfully with data from prior studies. Second, it was predicted that priming past failures to attain promotion and prevention goals would result in higher levels of maladaptive rumination compared to control priming. Third, it was predicted that the degree of maladaptive rumination following priming of past failures to attain promotion goals would vary as a function of (a) a participant's trait tendency to engage in rumination and trait pessimism, and (b) the extent to which dejection-related mood increased (or elation-related mood decreased) following failure feedback. In contrast, it was predicted that the degree of maladaptive rumination following priming of past failures to attain prevention goals would vary as a function of (a) a participant's trait tendency to engage

in rumination and trait pessimism, and (b) the extent to which agitation-related mood increased (or quiescence-related mood decreased) following failure feedback. Fourth, it was predicted that engaging in maladaptive rumination following promotion goal failure priming would interact with existing high levels of dejection or low levels of elation, resulting in intensification and prolonging of the negative mood state. Similarly, it was predicted that engaging in maladaptive rumination following prevention goal failure priming would interact with existing high levels of agitation or low levels of quiescence, resulting in intensification and prolonging of the negative mood state.

METHOD

Overview

The study took place on four separate days for each participant and was described to participants as two separate and unrelated studies. Subjects were invited to participate in a study of individual differences in motivational systems (Study 1: Preliminary Assessment). During the preliminary assessment, participants completed six computerized questionnaires assessing demographic information, goals, rumination, optimism/pessimism and symptoms of anxiety as well as depression. At the end of the preliminary assessment participants received \$10.00 and were invited to participate in an additional study on self-reflection and emotions that took place over three consecutive days (Study 2: Experimental Sessions 1-3).

Individuals willing to participate in Study 2 were scheduled for their next three appointments no sooner than 1 week after completing the preliminary assessment. During each of the three experimental sessions, participants were asked to engage in a writing task where they were exposed to goal failure and were also asked to complete a 5-minute mindfulness meditation exercise. Participants completed baseline ratings of internal self-awareness and mood, post-writing ratings of mood, as well as post-meditation ratings of mood and maladaptive rumination. Participants received \$10 for

each completed session for a total of \$30, and an additional \$10 for completing all three experimental sessions for a total of \$40.

Preliminary Assessment

Participants

Ninety-three graduate/professional students were recruited through flyers posted on campus and postings on graduate/professional electronic mailing listserves to participate in the preliminary assessment. The sample was 80% female, with a mean age of 26.33 years ($SD = 4.37$; Range = 21- 48 years). The sample was predominately Caucasian (72%), Asian (12%), and African American (9%). Eight-seven percent of participants spoke English as their primary language (see Table 1).

Procedure

The data collection for the preliminary assessment was computerized and designed to measure relevant individual difference variables and obtain an individualized set of promotion and prevention goals. The goal assessment was used to create stimulus materials for the writing tasks in experimental sessions 1-3, and in addition provided measures of the magnitude of self-regulatory failure. The preliminary assessment took place in private rooms equipped with Hewlett-Packard personal computers. All questionnaires were presented in counterbalanced order using MediaLab

v2006.1.12 software. The preliminary assessment took approximately 50 minutes to complete.

Table 1: Demographic Information

Demographic Variables	Study 1		Study 2	
	n	%	n	%
Age (<i>M, SD</i>)	26.33	4.37	26.37	4.56
Gender				
Male	19	20	16	21
Female	74	80	62	79
Ethnicity				
African American	8	9	8	10
American Indian	1	1	1	1
Asian	11	12	10	13
Caucasian	67	72	54	69
Hispanic	3	3	3	4
Other	3	3	2	3
Graduate Program				
Humanities	15	16	14	18
Professional	30	32	26	33
Sciences	39	42	31	40
Social Science	9	10	7	9
Primary Language				
English	81	87	67	86
Other	12	13	11	14
Practice Meditation?				
Yes	10	11	9	12
No	83	89	69	88
Depression				
Minimal (BDI 0-9)	57	61	50	64
Mild (BDI 10-16)	21	23	17	22
Moderate - Severe (BDI \geq 17)	15	16	11	14
Anxiety				
STAI \leq 49 th percentile*	31	33	28	36
STAI 54 th – 80 th percentile	37	40	30	38
STAI \geq 83 rd percentile	25	27	20	26

Notes: BDI = Beck Depression Inventory. STAI = State Trait Anxiety Inventory.

*Percentile norms based on a healthy female undergraduate sample.

Materials

Demographic Questionnaire. Participants were asked to provide demographic information regarding their age, sex, graduate/professional program, racial/ethnic background, primary language, and a brief assessment of their meditation practices and training.

Computerized Selves (CS). The CS (Shah & Higgins, 2001) was used to obtain trait adjectives comprising each participant's promotion and prevention goals, as well as to assess level of self-perceived failure to attain promotion and prevention goals. The version of the CS used in this study was modified based on theory and another measure of self-discrepancy (Hardin & Leong, 2005). The program asks each participant to "list six adjectives that describe how you ideally hope to be, i.e., the attributes of the person you would ideally like to be; the kind of person you wish or desire to be" (promotion goals) and to "list six adjectives that describe how you ought to be, i.e., the attributes of the person you feel you should be; the kind of person you believe it is your duty or responsibility to be" (prevention goals). These adjectives were then presented in random order, asking the participant to rate each attribute in response to four questions. Goal expectancy was assessed by the question "how likely is it that you will possess the following (ideal or ought) attribute in the future?" Goal importance was assessed by the question "at present, how important is it to you to have the following (ideal or ought)

attribute? Goal progress was assessed by the question “at present, how far away are you from possessing/living up to this (ideal or ought) attribute?” Goal discrepancy was assessed by the question “how much do you think this (ideal or ought) attribute actually describes or applies to you at this time?” Goal expectancy, importance and progress were rated on a 7-point scale ranging from 0 (*not at all*) to 7 (*extremely*) and goal discrepancy was rated on a 5-point scale ranging from 0 (*does not describe me at all*) to 5 (*completely describes me*). Separate measures of promotion goal expectancy, importance, progress, and discrepancy (Cronbach’s α s = .62, .63, .65, .56) were calculated by averaging across each of the six ‘ideal’ attributes for each question. Similarly, separate measures of prevention goal expectancy, importance, progress, and discrepancy (Cronbach’s α s = .65, .68, .62, .56) were calculated by averaging across each of the six ‘ought’ attributes for each question. In addition, a composite measure of promotion goal failure (Cronbach’s α = .79), was created by averaging promotion progress and promotion discrepancy ($r = .79, p < .0001$). Similarly, a composite score of prevention goal failure (Cronbach’s α = .75) was created by averaging prevention progress and prevention discrepancy ($r = .62, p < .0001$).

Rumination/Reflection Questionnaire (RRQ). The RRQ (Trapnell & Campbell, 1999) was developed to discriminate between neurotic (i.e., maladaptive rumination) and intellectual (i.e., self-reflection) forms of repetitive thought. The 12-item rumination subscale assesses threats to the self (e.g., “I tend to ‘ruminate’ or dwell over things that

happen to me for a really long time afterward"). This subscale was used to assess the trait tendency to engage in neurotic rumination. Participants also completed the 12-item reflection subscale assesses reflections on the self motivated by intellectual curiosity (e.g., "I love exploring my "inner" self"), however this scale was not used in the following analyses. Items are rated on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Trapnell and Campbell report internal consistency for the rumination and reflection subscales to be .90, and .91, respectively for a large sample of university undergraduates. In the current investigation, the internal consistency for the rumination subscale was .93.

Extended Life Orientation Test (ELOT). The ELOT (Chang, Maydeu-Olivares, & D'Zurilla, 1997) consists of 15 relevant-items and five filler-items and contains two subscales assessing optimism (e.g., "In uncertain times, I usually expect the best") and pessimism (e.g., "I hardly ever expect things to go my way"). Respondents rated each item on a 5-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Higher scores on each scale indicate greater optimism and pessimism. Reliability coefficients for the optimism and pessimism scales were found to be .86 and .90 for a sample of European American students (Hardin & Leong, 2005). In the current investigation, internal consistency of optimism and pessimism were .84 and .88, respectively.

Beck Depression Inventory (BDI). The BDI (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) is a widely-used 21-item measure of depressive and dysphoric symptoms. Respondents are asked to endorse items varying in severity from (0) to (3) in a number of life areas. For example, “I do not feel sad” scored (0); and “I am so sad or unhappy that I can’t stand it” scored (3). The highest rating for each item was summed across all 21 items to create a continuous measure of depressive symptoms (Cronbach’s $\alpha = .86$). Based the BDI manual (Beck & Steer, 1987), the BDI was used to classify individuals into three severity categories, minimal (BDI 0-9), mild (BDI 10-16), and Moderate – Severe (BDI ≥ 17).

State Trait Anxiety Inventory (STAI). The STAI (Spielberger, Gorsuch, & Lushene, 1970) is a self-report assessment, which includes separate measures of state anxiety (STAI-X1) and the more general quality of trait anxiety (STAI-X2). Participants completed only the STAI-X1 for the current investigation. The essential qualities evaluated by the 20-item STAI-X1 scale are feelings of apprehension, tension, nervousness, and worry (e.g., “I am jittery”). Items are rated on a 4-point scale ranging from 1 (*not at all*) to 4 (*very much so*). In the current investigation, the level of internal consistency was found to be .90.

Experimental Sessions 1-3

Participants

Of the original 93 participants, a total of 78 were successfully recruited to participate in experimental session 1-3. Three participants were not invited to participate in the experimental manipulation because their command of the English language prohibited them from understanding the questionnaires. The remaining 12 participants declined to participate because of the time commitment required. The final sub-sample was 79% female, with a mean age of 26.37 years ($SD = 4.56$; Range = 21- 48 years). The sample was predominately Caucasian (69%), Asian (13%), and African American (10%). Eight-six percent of participants spoke English as their primary language (see Table 1). To examine the possibility of attrition bias, t-tests were conducted on all preliminary assessment variables. Participants who declined to participate in experimental sessions 1-3 did not statistically differ from those who chose to participate on any of the preliminary assessment variables (all $ps > .1$).

Procedure

Participants were informed that the investigation was designed to examine the nature of people's thoughts and personal reflections as they write about themselves and as they engage in mindfulness meditation. Participants were told that mindfulness is a

meditation technique that has recently been incorporated into the treatment of several psychiatric disorders because of its ability to increase control over attentional focus and to increase self-awareness. Furthermore, participants were informed that we were interested in understanding the effects of engaging in two types of reflection (writing & meditation) on emotions.

Each participant was run individually in private rooms equipped with Hewlett-Packard personal computers. The experiment was created and run using MediaLab v2006.1.12 software developed by Empirisoft Corporation. The computer program allowed for a seamless transition from one portion of the experiment to another with no gaps in time or interruptions by the experimenter.

All 78 participants participated in all three conditions, consisting of (a) promotion goal priming, (b) prevention goal priming, and (c) yoked-control priming, on three consecutive days. The order in which participants were run in each condition was counterbalanced. During each experimental session, participants completed (1) a state measure of internal self-awareness; (2) a baseline measure of mood (T1); (3) a 15-minute writing task used to expose each participant to personal situations where s/he failed to live up to promotion, prevention, or yoked-control attributes (depending on the experimental condition), and (4) a post-writing measure of mood (T2). Immediately afterward, participants (5) engaged in a 5-minute 'mindfulness meditation' exercise; (6) completed a post-mediation measure of mood (T3); (7) endorsed whether or not they

experienced a list of thoughts assessing maladaptive rumination during the mindfulness meditation period; and (8) wrote a description of the thoughts that occurred during the meditation period. Each experimental session took approximately 35 minutes to complete.

Writing Task. After completing baseline ratings of internal self-awareness and mood, participants were presented with the instructions for the writing task. Participants were instructed with the following prompt in all three conditions “We will now begin the writing-reflection portion of the experiment. Please be as frank and descriptive as possible – there are no correct or incorrect answers.”

In promotion goal failure condition, participants were instructed as follows: “Please think about a time in your life when you wished or aspired to be more (xxxx), but you weren’t. (1) Where did the situation occur? (2) Who was present? (3) Did it involve close friends or family members? (4) How did you react in the situation? (5) What were the reactions of those around you? (6) What were you feeling? (7) In a few sentences, please describe the instance in which you wished or aspired to be more (xxxx), but you weren’t. When you are finished, please take a moment read over your answers and make any changes before pressing ‘Continue.’” This series of questions was presented three times, varying only the trait adjective. Therefore, participants generated a total of three separate situations from their past where they failed to live up to being three different pre-selected, promotion goals (e.g., intelligent, respectful, and organized).

These idiographically selected trait adjectives were pre-selected from each participant's self-generated list of promotion goals obtained from the CS (described in detail above). The three ideal attributes that were rated highest on promotion goal discrepancy and promotion goal progress were presented (promotion failure). These attributes were also selected to be semantically unrelated to the participant's prevention goals.

In the prevention condition the series of questions remained the same with the exception of the initial prompt and instruction number (7). These were changed to the following: "Please think about a time in your life when you felt that it was your duty or obligation to be more (xxxx), but you weren't. (7) In a few sentences, please describe the instance in which you felt that it was your duty or obligation to be more (xxxx), but you weren't. When you are finished, please take a moment read over your answers and make any changes before pressing 'Continue.' As in the promotion condition, participants generated a total of three separate situations where they failed to live up to being three different pre-selected, prevention goals (e.g., caring, persevering, and successful). These three attributes were obtained from the CS. The three ought attributes that were rated highest on prevention goal discrepancy and prevention goal progress, were presented (prevention failure). These attributes were selected to be semantically unrelated to the participant's promotion goals.

In the yoked-control condition, participants were presented with a random ordering of the promotion and prevention prompts. As in the previous conditions,

participants generated a total of three separate situations where they failed to live up to being three different trait attributes (e.g., intelligent, respectful, and organized). Yoked-control attributes were selected from the promotion and prevention goal lists of other participants; they were selected to be semantically unrelated to all of the responses generated by the target participant. Each set of control attributes, on average, were taken from the priming lists of three other participants. The yoked-control cues provide a test of the alternative hypothesis that the literal content of cues, rather than their status as idiographic goals, would account for their impact following priming.

Mindfulness Meditation. Participant were presented with the following instructions, “When you are ready please press the ‘Enter’ key to begin the mindfulness meditation portion of the experiment. After the meditation period is over you will be asked several questions about your experience. The meditation exercise will last for 5 minutes.” Participants were already seated in a private, quiet room, where the following recorded instructions were played: “In this sitting practice we would like you to just sit with your eyes closed. The bell will ring three times to signal the beginning and the end of the exercise.”

Materials

State Private Self-Consciousness (SPrSC). The SPrSC (Fenigstein, Scheier, & Buss, 1975) was developed to assess consciousness of one’s inner feelings, thoughts and

physical sensations. Participants respond to the 10-item subscale by rating a series of statements (e.g., “I am trying to figure myself out” and “I am reflecting on myself”) from 1 (very slightly, not at all) to 5 (extremely). This measure was used to obtain a measure of state internal self-awareness (S. I. self-awareness; α s = .83-.85).

Mood Scales. Three parallel measures¹ of dejection, agitation, elation and quiescence – the mood states predicted by SDT and RFT to be associated with promotion failure, prevention failure, promotion success, and prevention success respectively – were created from the Sadness (5-items), Fear (6-items), Joviality (8-items), and Serenity (3-items) subscales of the Positive and Negative Affect Scale – Expanded Form (PANAS-X; Watson & Clark, 1990; see Table 2). These three versions were used to assess mood at three different time points during the experiment: Baseline (T1), Post-Writing Task (T2), and Post-Meditation (T3). Participants were asked to rate seven adjectives on a 5-point scale, from 1 (felt very slightly or not at all) to 5 (felt very much), in response to the

¹ The original intention was to use confirmatory factor analyses to test the appropriateness of combining the PANAS-X fear and serenity subscales to create a measure of agitation as well as combine the sadness and joviality subscales to measure dejection. However, conducting these analyses was not deemed appropriate because of low sample size resulting from the implementation of the measures. The three versions were randomized across each of the three experimental time points. This randomization resulted in having approximately 23-29 subjects taking the same version of a measure in the same condition at the same time point. It was considered inappropriate to combine responses to the version across time points to create a sample size of 79 because theoretically the experimental manipulation should have affected the covariance structure. When confirmatory factor analyses were conducted the factor structures were inconsistent across experimental conditions, and produced several Heywood cases and failed to converge for other models despite manipulating the iterations, starting points, and bootstrapping. Given the lack of consistent results due to the limited sample size and number of estimators per factor, I concluded that the results suggested not combining items from different subscales but rather following original scale development.

prompt: “Right now, at this very moment do you feel xxxx.” The presentation order of the parallel versions was randomized within condition across the three assessment time points to minimize the impact of possible version effects.

Table 2: Parallel Versions of Emotion Created from the PANAS-X

Emotion	Version 1	Version 2	Version 3
Elation	Happy	Joyful	Cheerful
	Excited	Lively	Delighted
Quiescence	Calm	Relaxed	At ease
Dejection	Sad	Blue	Sad
	Alone	Lonely	Downhearted
Agitation	Afraid	Frightened	Scared
	Jittery	Nervous	Shaky

Note: PANAS-X = Positive and Negative Affect Scale – Expanded Form

Maladaptive Rumination Rating Scales. Participants were asked to endorse statements that best describe the thoughts that occurred to them during the meditation exercise. This scale was developed for the present study and was based primarily on a scale developed by Nolen-Hoeksema et al. (1993) for participants to report on daily experiences of rumination. In the original version of the scale, Nolen-Hoeksema and colleagues asked participants to indicate their current depressed mood and then chose from among a series of statements that closely matched what they thought about in response to that mood (e.g., “Why do I always react this way?”). Additional questions were adapted from the White Bear Suppression Inventory (Wegner & Zanakos, 1994) and the Rumination and Reflection Questionnaire (Trapnell & Campbell, 1999) to measure controllability, intrusiveness, and the tendency to repeatedly focus on a

personal failure (e.g., “at times I really wished I could stop thinking”; and “My attention was focused on aspects of myself I wish I’d stop thinking about). Participants were asked to “Please place an “X” next to any of the descriptions that match closely your experience during the meditation exercise.” The number of items endorsed was summed to create a continuous measure of rumination. Participants completed one of the three versions of the scale during each condition. Presentation of the three versions was counterbalanced across conditions to minimize the impact of version effects. Each version consisted of a total of 7 items. The following internal consistency (Kuder-Richardson 20 Coefficient) estimated were found for the three versions: version 1 = .64, version 2 = .32, version 3 = .58.

Emotional Content of the Writing Task. The qualitative descriptions of the three failure situations that participants produced, as well as participants’ responses to the question (6) “What were you feeling when the failure situation occurred?”, were analyzed for each experimental condition with the computerized text analysis program, Linguistic Inquiry and Word Count (LIWC2001; Pennebaker, Francis, & Booth, 2001). The program analyzes text files based on a dictionary comprised of 2,300 words and word stems and sorts these words into 17 standard linguistic dimensions, 25 word categories tapping psychological constructs, 10 dimensions related to “relativity”, and 19 personal concerns categories. The program converts the sums of each of the scales to a percentage of total words to correct for differences in text length between participants.

We used first person pronoun use extracted from failure summaries to measure internal self-focus (Pyszczynski, Holt, & Greenberg, 1987). In addition, the anxiety, anger (type of agitation), and sadness scales to calculate the degree of each of these constructs in content of failure summaries. Similarly, we calculated the amount of recalled anxiety, anger, and sadness in response to question (6).

RESULTS

Preliminary Assessment

Descriptive Statistics of Preliminary Assessment Variables

Depressive and anxious severity. The sample demonstrated significant variability in severity of depressive symptoms on the BDI ($M = 8.82$, $SD = 7.10$) with 23% of participants categorized as mildly depressed and 16% moderately/severely depressed. On average, the sample demonstrated less variability in anxious severity on the STAI ($M = 36.74$, $SD = 8.90$); 17% of the sample scored between the 83rd and 93rd percentile and 9% scored at or above the 93rd percentile when compared to a normative sample of healthy women (Spielberger et al., 1970).

Promotion goal ratings. The sample reported on average that they were moderately far away from attaining the characteristics that comprised their promotion goals ($M = 3.46$, $SD = 0.97$, Range: 1.67 – 6.17) and felt that their promotion goals currently described/applied to them somewhat ($M = 2.81$, $SD = 0.57$, Range: 1.50 – 4.83.) In addition, participants reported that they expected to be able to attain their promotion goals ($M = 5.32$, $SD = 0.77$, Range: 2.67 – 6.83) and rated attaining their promotion goals as very important ($M = 5.89$, $SD = 0.71$, Range: 3.17 – 7.00).

Prevention goal ratings. The sample reported on average that they were moderately far away from attaining their prevention goals ($M = 3.49$, $SD = 0.97$, Range: 1.50 – 5.83) and felt that their prevention goals currently described/applied to them somewhat ($M = 2.65$, $SD = 0.57$, Range: 1.17 – 4.33). In addition, participants reported that they expected to be able to attain their prevention goals ($M = 5.38$, $SD = 0.75$, Range: 3.17 – 7.00) and rated attaining their prevention goals as very important ($M = 5.67$, $SD = 0.87$, Range: 3.00 – 7.00).

Interestingly, participants reported that attaining their promotion goals was more important than attaining their prevention goals $t = 2.24$, $df = 77$, $p < .05$. In addition, participants reported that they were more discrepant from their promotion goals than their prevention goals $t = 2.24$, $df = 77$, $p < .05$. They were no statistically significant differences between promotion and prevention on expectancy of attainment, progress, or overall perceived failure in goal attainment (all $ps > .1$).

Trait measures of rumination, optimism, and pessimism. Participants on average were endorsed a trait tendency to engage in neurotic rumination ($M = 3.65$, $SD = 0.73$), with 33% of the sample indicating that they agreed or strongly agreed that they possessed a tendency to engage in neurotic rumination. On average, participants were more optimistic ($M = 22.68$, $SD = 4.09$) than pessimistic ($M = 18.49$, $SD = 6.14$) $t = 4.03$, $df = 77$, $p < .0001$. Across five different normative samples, mean scores on optimism ranged from 21.33 – 22.20, SD : 3.41 – 3.69 and mean scores for pessimism ranged from 20.57 – 25.88,

SD: 6.28 – 6.59 (Chang, 1996; Chang et al, 1997; Hardin & Leong, 2005) suggesting that the current sample appeared to be less pessimistic than the normative samples.

Bivariate associations among preliminary assessment variables. Table 3 summarizes the associations among preliminary assessment variables. Participants who experienced higher levels of depression also reported higher levels of anxiety ($r = .44, p < .0001$), trait rumination ($r = .57, p < .0001$), and trait pessimism ($r = .46, p < .0001$), as well as less trait optimism, ($r = -.46, p < .0001$). Participants who reported greater levels of anxiety also reported a greater trait tendency to ruminate ($r = .40, p < .0001$) and be pessimistic ($r = .41, p < .0001$), as well as be less optimistic ($r = -.41, p < .0001$). A greater trait tendency to engage in rumination was associated with being more pessimistic ($r = .44, p < .0001$), and less optimistic ($r = -.41, p < .0001$). Participants who reported higher levels of promotion failure also reported higher levels of prevention failure ($r = .45, p < .0001$).

Participants who experienced greater levels of promotion failure also reported higher levels of depression ($r = .34, p < .001$), anxiety ($r = .37, p < .001$), trait rumination ($r = .23, p < .05$) and pessimism ($r = .40, p < .0001$). In addition, participants who experienced greater levels of promotion failure were less optimistic ($r = -.41, p < .0001$), reported lower promotion expectancies ($r = -.70, p < .0001$), and lower promotion importance ($r = -.26, p < .01$). Participants with higher levels of promotion expectancy reported lower levels of depression ($r = -.19, p < .10$), anxiety ($r = -.33, p < .001$), trait

Table 3: Bivariate Associations Among Preliminary Assessment Variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1. Depression	.86														
2. Anxiety	.44 ^d	.90													
3. Trait Rumination	.57 ^d	.40 ^d	.93												
4. Pessimism	.46 ^d	.41 ^d	.44 ^d	.88											
5. Optimism	-.46 ^d	-.41 ^d	-.41 ^d	-.59 ^d	.84										
6. Promotion Failure	.34 ^c	.37 ^c	.23 ^a	.40 ^d	-.41 ^d	.79									
7. Promotion Progress	.31 ^b	.34 ^c	.20 ^a	.36 ^c	-.36 ^c	.97 ^d	.65								
8. Promotion Discrepancy	.35 ^c	.36 ^c	.23 ^a	.41 ^d	-.45 ^d	.92 ^d	.79 ^d	.56							
9. Promotion Expectancy	-.19 [†]	-.33 ^c	-.24 ^a	-.41 ^d	.40 ^d	-.70 ^d	-.64 ^d	-.71 ^d	.62						
10. Promotion Importance	-.04	-.13	.00	-.30 ^b	.10	-.26 ^b	-.23 ^a	-.28 ^b	.47 ^d	.63					
11. Prevention Failure	.22 ^a	.31 ^b	.29 ^b	.41 ^d	-.34 ^c	.45 ^d	.44 ^d	.40 ^d	-.28 ^b	-.17 [†]	.75				
12. Prevention Progress	.17 [†]	.26 ^b	.30 ^b	.34 ^c	-.23 ^a	.43 ^d	.45 ^d	.34 ^c	-.23 ^a	-.12	.95 ^d	.62			
13. Prevention Discrepancy	.24 ^a	.33 ^c	.20 [†]	.41 ^d	-.44 ^d	.37 ^c	.33 ^b	.39 ^d	-.30 ^b	-.20 [†]	.84 ^d	.62 ^d	.56		
14. Prevention Expectancy	-.14	-.24 ^a	-.17 [†]	-.49 ^d	.43 ^d	-.26 ^b	-.25 ^b	-.24 ^a	.42 ^d	.30 ^b	-.63 ^d	-.50 ^d	-.70 ^d	.65	
15. Prevention Importance	-.01	.07	.05	-.11	.11	.14	.13	.14	.07	.36 ^c	-.17 [†]	-.09	-.24 ^a	.48 ^d	.68
M	9.20	37.48	3.64	18.31	22.54	3.15	3.47	2.82	5.27	5.88	3.06	3.45	2.67	5.38	5.67
SD	7.07	3.64	0.76	5.97	4.07	0.71	0.92	0.57	0.77	0.70	0.69	0.94	0.57	0.75	0.82

Note: [†] $p < .10$. ^a $p < .05$. ^b $p < .01$. ^c $p < .001$. ^d $p < .0001$. Sample size = 93. The internal-consistency for each variable is listed on the main diagonal of the correlation table.

rumination ($r = -.24, p < .05$), and pessimism ($r = -.41, p < .0001$), as well as higher levels of optimism ($r = .40, p < .0001$) and promotion importance ($r = .47, p < .0001$). Lower levels of promotion importance was associated with higher levels of pessimism ($r = -.30, p < .01$). Promotion importance was not associated with depression, anxiety, trait rumination, or optimism ($ps > .1$).

Participants who reported greater levels of prevention failure also reported higher levels of depression ($r = .22, p < .05$), anxiety ($r = .31, p < .01$), trait rumination ($r = .29, p < .01$) and pessimism ($r = .41, p < .0001$), as well lower levels of optimism ($r = -.34, p < .0001$), prevention expectancy ($r = -.63, p < .0001$), and prevention importance ($r = -.17, p < .10$). High levels of prevention expectancy were associated with lower levels of anxiety ($r = -.24, p < .05$), trait rumination ($r = -.17, p < .10$), pessimism ($r = -.49, p < .0001$), as well as higher levels of optimism ($r = .43, p < .0001$) and prevention importance ($r = .48, p < .0001$). Prevention expectancy was not associated with depression ($p > .1$). Prevention importance was not associated with depression, anxiety, trait rumination, pessimism, or optimism ($ps > .1$).

To test the specificity predictions of SDT and RFT in the cross-sectional data, simultaneous regression analyses were conducted. The first simultaneous analysis was used to examine the specific relationship between promotion failure and depressive symptoms, controlling for anxiety and prevention failure. The overall model was

significant $F(3, 92) = 8.98, p < .0001, R^2_{Adj.} = .21$. As predicted, after controlling for anxiety ($\beta = .36, t = 3.55, p < .001, SR^2 = .11$) and prevention failure ($\beta = .01, t = 0.15, p > .1, SR^2 = .00$), promotion failure was marginally correlated with depressive symptoms ($\beta = .20, t = 1.90, p < .10, SR^2 = .03$). A parallel analysis was conducted to examine the specific relationship between prevention failure and anxiety symptoms controlling for depressive symptoms and promotion failure. The overall model was significant $F(3, 92) = 10.79, p < .0001, R^2_{Adj.} = .24$. However, after controlling for depressive symptoms ($\beta = .34, t = 3.55, p < .001, SR^2 = .10$) and promotion failure ($\beta = .18, t = 1.70, p < .10, SR^2 = .02$), prevention failure was not significantly correlated with anxious symptoms ($\beta = .16, t = 1.54, p > .1, SR^2 = .02$).

Experimental Manipulation

Differences in State Internal Self-Awareness

As formulated by objective self-awareness theory (Duval & Wicklund, 1972) and control theory (Carver & Scheier, 1981, 1990, 1998, 1999) the process of self-regulation is instigated by focusing attention on the self. Repeated measures analyses of variance (ANOVA) was conducted to rule out the alternate hypothesis that detected differences across conditions are due to participants being differentially self-aware at the start of a particular condition (i.e., prior to the experimental manipulation).

A repeated measures analysis of variance (ANOVA) was conducted with condition (i.e., promotion, prevention, and yoked-control) as the within-subjects factor and state internal self-awareness as the dependent variable. Given that all pairwise differences are of interest, these differences were calculated even if the overall model detected no differences between condition means. The level of state internal self-awareness prior to writing about promotion ($M = 2.84$, $SD = 0.71$), prevention ($M = 2.78$, $SD = 0.70$), and yoked-control ($M = 2.85$, $SD = 0.65$) failure did not differ significantly, $F(2,154) = .90$, $p > .1$. The results indicated that all pairwise differences were non-significant ($ps > .1$). It is possible to conclude therefore that detected differences across conditions are not due to differences in the degree to which participants were internally self-aware at the start of the experimental condition.

Writing-Task Manipulation Check

Several repeated measures ANOVAs were conducted to determine the effectiveness of the experimental manipulation. Specifically, I tested the degree to which writing about promotion, prevention, and yoked-control prompts induced changes in internal self-focus. This provided a test of the hypothesis that writing about yoked-control failure would induce less of an internal focus due to the fact that yoked-control goals have less motivational significance than promotion or prevention goals. In addition, a series of repeated measures analyses of variance were conducted to test differences

affective content in written summaries, and recalled affect experienced during the past-event as a function of experimental condition. As in the previous analyses all pairwise differences were of interest, and so these differences were to be examined even if the overall model detected no differences between condition means.

Following these initial analyses, specificity analyses (Boldero, Moretti, Bell, & Francis, 2005) were conducted using Proc Mixed (SAS V9.1) using restricted/residual maximum likelihood estimation. The following results were obtained using the multivariate unstructured covariance structure after evaluating variance components, Huynh-Feldt, and compound symmetry covariance structures. Pairwise comparisons were conducted on least-squared means of fixed effects.

Internal self-focus. A repeated measures analysis of variance (ANOVA) was conducted with condition (i.e., promotion, prevention, and yoked-control) as the within-subjects factor and internal self-focus as the dependent variable. The level of internal self-focus induced while writing about promotion, prevention, and yoked-control failure did not differ significantly, $F(2,154) = 1.12, p > .1$, all pairwise differences were non-significant ($ps > .1$). Failure to find differences between the yoked-control condition and the other active conditions is contrary to what would be expected and it suggests that the yoked-control condition did engage the process of self-regulation and was thus a motivationally active condition. Table 4 summarizes the degree of induced self-focus and magnitude/type of affective content in the written summaries by priming condition.

Recalled sadness. A repeated measures ANOVA was conducted with condition as the within-subject factor and recalled sadness as the dependent variable. The level of recalled sadness experienced during past promotion, prevention, and yoked-control failure differed significantly $F(2,154) = 3.14, p < .05$. As predicted, pairwise comparisons indicated that participants writing about past failures to live up to promotion goals recalled experiencing more sadness ($M = 6.56, SD = 10.23$) than participants writing about prevention failure ($M = 4.16, SD = 7.32$), $F(1, 77) = 3.85, p < .05$, Cohen's $d = .27$, or yoked-control failure situations ($M = 3.89, SD = 7.70$), $F(1,77) = 4.51, p < .05$, Cohen's $d = .29$. There were no significant differences between prevention and yoked-control conditions in the level of recalled sadness ($p > .1$).

The previous analysis was repeated controlling for recalled anxiety and anger. After controlling for recalled anxiety ($B = 0.20, SE = 0.06, t = 3.44, df = 77, p < .001$) and recalled anger ($B = 0.23, SE = 0.05, t = 4.51, df = 77, p < .0001$), the level of recalled sadness experienced during past promotion, prevention, and yoked-control failure did not differ significantly $F(2,77) = 2.01, p > .1$. However, as predicted, pairwise comparisons indicated that participants writing about past failures to live up to promotion goals recalled experiencing more sadness ($M = 6.32, SE = 1.08$) than participants writing about prevention failure ($M = 4.04, SE = 0.80$), $t = 1.88, df = 77, p < .10$, or yoked-control failure situations ($M = 4.26, SE = 0.84$), $t = 1.79, df = 77, p < .10$. There were no significant

differences between prevention and yoked-control conditions in the level of recalled sadness ($p > .1$).

Sadness content. A repeated measures ANOVA was conducted with condition as the within-subject factor and sadness content and the dependent variable. The level of sadness content in written summaries of promotion, prevention, and yoked-control failure did not differ significantly $F(2,154) = 1.63, p > .1$. All pairwise comparisons were non-significant ($ps > .1$).

The previous analysis was repeated controlling for anxiety and anger content. After controlling for anxiety content ($B = 0.06, SE = 0.07, t = 0.84, df = 77, p > .1$) and anger content ($B = 0.01, SE = 0.06, t = 0.19, df = 77, p > .1$), the level of sadness content in written summaries of promotion, prevention, and yoked-control failure did not differ significantly $F(2,77) = 1.57, p > .1$. All pairwise comparisons were non-significant ($ps > .1$).

Recalled anxiety. A repeated measures ANOVA was conducted with condition as the within-subjects factor and recalled anxiety as the dependent variable. The level of recalled anxiety experienced during past promotion, prevention, and yoked-control failure situations did not differ significantly $F(2,154) = 2.22, p > .1$. Pairwise comparisons indicated that when writing about past failures to live up to prevention goals, participants recalled experiencing marginally less anxiety ($M = 4.72, SD = 7.11$) than when they wrote about promotion failure ($M = 7.17, SD = 12.33$), $F(1,77) = 3.66, p < .10$,

Cohen's $d = -.24$. No other significant differences were found between conditions ($ps > .1$).

The previous analysis was repeated controlling for recalled sadness and anger. After controlling for recalled sadness ($B = .22$, $SE = 0.07$, $t = 3.30$, $df = 77$, $p < .001$) and recalled anger ($B = -0.08$, $SE = 0.05$, $t = -1.48$, $df = 77$, $p > .1$), the level of recalled anxiety experienced during past promotion, prevention, and yoked-control failure situations did not differ significantly $F(2,77) = 0.96$ $p > .1$. Again, all pairwise comparisons were non-significant ($ps > .1$).

Anxiety content. A repeated measures ANOVA was conducted with condition as the within-subject factor and anxiety content as the dependent variable. The level of anxiety content in written summaries of promotion, prevention, and yoked-control failure did not differ significantly $F(2,154) = .55$, $p > .1$. All pairwise comparisons were non-significant ($ps > .1$).

The previous analysis was repeated controlling for sadness and anger content. After controlling for sadness content ($B = .03$, $SE = 0.06$, $t = 0.56$, $df = 77$, $p > .1$) and anger content ($B = -.03$, $SE = 0.05$, $t = -0.62$, $df = 77$, $p > .1$), the level of anxiety content in written summaries of promotion, prevention, and yoked-control failure did not differ significantly $F(2,77) = 0.57$, $p > .1$. All pairwise comparisons were non-significant ($ps > .1$).

Recalled anger. A repeated measures ANOVA was conducted with condition as the within-subjects factor and recalled anger as the dependant variable. The level of

recalled anger experienced during past promotion, prevention, and yoked-control failure situations did not differ significantly $F(2,154) = 1.65, p > .1$. Consistent with predictions of SDT and RFT, pairwise comparisons indicated that when writing about past failures to live up to prevention goals, participants recalled experiencing more anger ($M = 7.25, SD = 11.35$) than when they wrote about yoked-control failure ($M = 4.62, SD = 7.55$), $F(1,77) = 3.13, p < .10$, Cohen's $d = .27$. No other significant differences were found between conditions ($ps > .1$).

The previous analysis was repeated controlling for recalled sadness and anxiety. After controlling for recalled sadness ($B = .33, SE = 0.07, t = 4.94, df = 77, p < .0001$) and recalled anxiety ($B = -.01, SE = 0.06, t = -0.24, df = 77, p > .1$), the level of recalled anger experienced during past promotion, prevention, and yoked-control failure situations did not differ significantly $F(2,77) = 1.75, p > .1$. However, consistent with predictions of SDT and RFT, pairwise comparisons indicated that when writing about past failures to live up to prevention goals, participants recalled experiencing more anger ($M = 7.47, SE = 1.26$) than when they wrote about yoked-control failure ($M = 4.94, SE = 0.81$), $t = 1.80, df = 77, p < .100$. No other significant differences were found between conditions ($ps > .1$).

Anger content. A repeated measures ANOVA was conducted with condition as the within-subject factor and anger content as the dependent variable. The level of anger content in written summaries of promotion, prevention, and yoked-control failure were marginally different $F(2,154) = 2.43, p < .10$. As predicted by SDT and RFT, pairwise

comparisons indicated that when writing about failure to live up to prevention goals, participants' written summaries contained more anger content ($M = 0.64$, $SD = 0.61$) than when they wrote about promotion failure situations ($M = 0.44$, $SD = 0.49$), $F(1, 77) = 5.31$, $p < .05$, Cohen's $d = .36$. No other significant differences were found between conditions ($ps > .1$).

The previous analysis was repeated controlling for sadness and anxiety content. After controlling for sadness content ($B = .04$, $SE = 0.07$, $t = 0.56$, $df = 77$, $p > .1$) and anxiety content ($B = -.00$, $SE = -.04$, $p > .1$), the level of anger content in written summaries of promotion, prevention, and yoked-control failure were marginally different $F(2,77) = 2.62$, $p < .10$. As predicted by SDT and RFT, pairwise comparisons indicated that when writing about failure to live up to prevention goals, participants' written summaries contained more anger content ($M = 0.64$, $SE = 0.07$) than when they wrote about promotion failure situations ($M = 0.44$, $SE = 0.06$), $t = -2.29$, $df = 77$, $p < .05$. No other significant differences were found between conditions ($ps > .1$). Table 5 summarizes the least-squared adjusted means of recalled affective and affect content in written summaries by priming condition.

In summary, the results suggest that the experimental manipulation worked somewhat as expected. In response to prompts designed to elicit past situations of promotion failure, participants recalled situations where they experienced more dejection-related emotions than when writing about prevention and yoked-control

failure situations. Similarly, in response to prompts designed to elicit past situations of prevention failure, participants recalled situations where they experienced more agitation-related emotions associated with anger. However, the overall pattern of findings regarding the experimental manipulation suggested that it may have been less effective in inducing the hypothesized psychological processes and states than had been expected. This issue will be discussed further after examining findings for the outcome variables of interest.

Table 4: Mean and Standard Deviations of Internal Self-Focus and Affective Experience Associated With The Experimental Manipulation

Variables	Promotion	Prevention	Yoked-Control
Internal Self-Focus			
<i>M</i>	11.07 ^a	11.06 ^a	10.66 ^a
<i>SD</i>	2.18	2.51	2.47
Recalled Sadness			
<i>M</i>	6.56 ^b	4.16 ^c	3.89 ^c
<i>SD</i>	10.23	7.32	7.70
Sadness Content			
<i>M</i>	0.45 ^a	0.45 ^a	0.32 ^a
<i>SD</i>	0.54	0.55	0.47
Recalled Anxiety			
<i>M</i>	7.17 ^a	4.72 ^b	5.31 ^{ab}
<i>SD</i>	12.33	7.11	8.06
Anxiety Content			
<i>M</i>	0.37 ^a	0.41 ^a	0.34 ^a
<i>SD</i>	0.52	0.51	0.39
Recalled Anger			
<i>M</i>	5.64 ^{ab}	7.25 ^a	4.62 ^b
<i>SD</i>	8.88	11.35	7.55
Anger Content			
<i>M</i>	0.44 ^a	0.64 ^b	0.50 ^{ab}
<i>SD</i>	0.49	0.61	0.67

Note. ab $p < .10$. bc $p < .05$. Means in each row sharing subscripts are not significantly different.

Table 5: Adjusted Means, and Standard Errors of Affective Experience Associated With The Experimental Manipulation

Variables	Promotion	Prevention	Yoked-Control
Recalled Sadness			
<i>M</i>	6.32 _a	4.04 _b	4.26 _b
<i>SE</i>	1.08	0.80	0.84
Sadness Content			
<i>M</i>	0.45 _a	0.44 _a	0.32 _a
<i>SE</i>	0.06	0.06	0.05
Recalled Anxiety			
<i>M</i>	6.77 _a	4.99 _a	5.43 _a
<i>SE</i>	1.37	0.78	0.93
Anxiety Content			
<i>M</i>	0.37 _a	0.41 _a	0.34 _a
<i>SE</i>	0.06	0.06	0.04
Recalled Anger			
<i>M</i>	5.11 _{ab}	7.47 _a	4.94 _b
<i>SE</i>	0.96	1.26	0.81
Anger Content			
<i>M</i>	0.44 _b	0.64 _c	0.51 _{bc}
<i>SE</i>	0.06	0.07	0.08

Note. *ab p* < .10. *bc p* < .05. Means in each row sharing subscripts are not significantly different.

Changes in Experienced Emotion during Experimental Sessions

Table 6 summarizes the changes in mood from baseline (T1) to post-writing task (T2) to post-meditation period (T3). Repeated measures ANOVAs were conducted within each condition for each emotion, with time as the within-subjects factor. These analyses were followed by pairwise comparison *F* tests. These analyses were conducted to determine the overall pattern of changes in mood across the experiment within each experimental condition.

Dejection. Significant effects for time were detected in the promotion, $F(2,154) = 12.39, p < .0001$, prevention, $F(2,154) = 7.80, p < .001$, and yoked-control conditions $F(2,154) = 8.55, p < .001$. In all three conditions, participants experienced an increase in dejection from time 1 ($M = 1.54, SD = 0.88$; $M = 1.58, SD = 0.78$; $M = 1.64, SD = 0.75$; respectively) to time 2 ($M = 1.85, SD = 1.00$; $M = 1.85, SD = 0.79$; $M = 1.82, SD = 0.89$; respectively) $F(1,77) = 16.19, p < .0001$, Cohen's $d = .33$; $F(1,77) = 10.04, p < .01$, Cohen's $d = .34$; $F(1,77) = 7.04, p < .001$, Cohen's $d = .22$; respectively. Also, in all three conditions, participants experienced a significant decrease in dejection from the time 2 to time 3 ($M = 1.55, SD = 0.80$; $M = 1.62, SD = 0.70$; $M = 1.56, SD = 0.69$; respectively) $F(1,77) = 16.73, p < .0001$, Cohen's $d = -.33$; $F(1,77) = 11.71, p < .001$, Cohen's $d = -.31$; $F(1,77) = 16.04, p < .0001$, Cohen's $d = -.33$; respectively. Likewise, in all three conditions, participants' time 3 levels of emotion returned to time 1 levels $F(1,77) = .01, p > .1$, Cohen's $d = .01$; $F(1,77) = .22, p > .1$, Cohen's $d = .05$; $F(1,77) = 1.84, p > .1$, Cohen's $d = -.11$.

Elation. Significant effects for time were detected in the promotion, $F(2,154) = 16.11, p < .0001$, prevention, $F(2,154) = 25.65, p < .0001$, and yoked-control conditions $F(2,154) = 17.59, p < .0001$. In all three conditions, participants experienced a decrease in elation from time 1 ($M = 2.77, SD = 1.00$; $M = 2.87, SD = 1.04$; $M = 2.82, SD = 0.96$; respectively) to time 2 ($M = 2.26, SD = .96$; $M = 2.20, SD = .96$; $M = 2.38, SD = 0.95$; respectively) $F(1,77) = 25.36, p < .0001$, Cohen's $d = -.52$; $F(1,77) = 45.04, p < .0001$, Cohen's $d = -.67$; $F(1,77) = 37.31, p < .0001$, Cohen's $d = -.46$; respectively. In all three conditions,

participants experienced no significant change in affect from time 2 to time 3 $F(1,77) = 1.32, p > .1$, Cohen's $d = .12$; $F(1,77) = 2.42, p > .1$, Cohen's $d = .14$; $F(1,77) = .02, p > .1$, Cohen's $d = -.01$; respectively. Likewise, in all three conditions, participants' time 3 levels of emotion ($M = 2.38, SD = 1.02$; $M = 2.34, SD = 1.00$; $M = 2.37, SD = 1.03$; respectively) remained significantly lower than time 1 levels $F(1,77) = 25.28, p < .0001$; Cohen's $d = -.39$; $F(1,77) = 25.31, p < .0001$, Cohen's $d = -.52$; $F(1,77) = 24.11, p < .0001$, Cohen's $d = -.45$; respectively.

Agitation. A significant effect for time was detected in the promotion condition $F(2,154) = 4.64, p < .01$; no significant effects for time were detected in the prevention $F(2,154) = 1.17, p > .1$, or yoked-control conditions $F(2,154) = 1.55, p > .1$. In all three conditions, participants experienced no significant change in agitation from time 1 ($M = 1.42, SD = 0.63$; $M = 1.33, SD = 0.45$; $M = 1.47, SD = 0.76$; respectively) to time 2 ($M = 1.46, SD = 0.65$; $M = 1.35, SD = 0.52$; $M = 1.43, SD = 0.60$; respectively) $F(1,77) = .46, p > .1$, Cohen's $d = .06$; $F(1,77) = 0.12, p > .1$, Cohen's $d = .04$; $F(1,77) = 0.38, p > .1$, Cohen's $d = .06$; respectively. However, in the promotion condition, participants experienced a decrease in agitation from time 2 to time 3 ($M = 1.28, SD = 0.47$) $F(1,77) = 7.74, p < .01$, Cohen's $d = -.32$; participants' time 3 levels of agitation were also significantly lower than time 1 $F(1,77) = 4.79, p < .05$, Cohen's $d = -.25$. In the prevention and yoked-control conditions, participants experienced no significant change in agitation from time 2 to time 3 ($M = 1.27, SD = 0.42$; $M = 1.36, SD = 0.60$) $F(1,77) = 2.09, p > .1$, Cohen's $d = -.17$; $F(1,77) = 1.34, p$

> .1, Cohen's $d = -.12$. In the prevention condition, participants' time 3 levels of agitation did not significantly differ from time 1 levels $F(1,77) = 1.43, p > .1$, Cohen's $d = .14$. In the yoked-control condition, participants' time 3 levels of agitation were marginally lower than time 1 levels of agitation $F(1,77) = 2.82, p < .10$, Cohen's $d = .16$.

Quiescence. Significant effects for time were detected in the promotion $F(2,154) = 13.54, p < .0001$, prevention $F(2,154) = 5.35, p < .01$, and yoked-control conditions $F(2,154) = 8.16, p < .001$. In all three conditions, participants experienced a decrease in quiescence from time 1 ($M = 3.27, SD = 0.95; M = 3.24, SD = 0.91; M = 3.37, SD = 0.98$, respectively) to time 2 ($M = 2.88, SD = 0.98; M = 2.92, SD = 0.95; M = 3.09, SD = 0.97$; respectively), $F(1,77) = 11.32, p = .001$, Cohen's $d = -.40$; $F(1,77) = 7.43, p = .01$, Cohen's $d = -.34$; $F(1,77) = 7.05, p < .01$, Cohen's $d = -.29$; respectively. Also, in all three conditions participants experienced an increase in quiescence from time 2 to time 3 ($M = 3.51, SD = 1.11; M = 3.28, SD = 1.08; M = 3.56, SD = 1.00$, respectively) $F(1,77) = 23.65, p < .0001$, Cohen's $d = .60$; $F(1,77) = 9.22, p = .01$, Cohen's $d = .35$; $F(1,77) = 14.46, p = .001$, Cohen's $d = .48$; respectively. In the prevention and yoked-control conditions, participants' time 2 levels of quiescence recovered to time 1 levels $F(1,77) = .09, p > .1$, Cohen's $d = .04$; $F(1,77) = 2.46, p > .1$, Cohen's $d = .20$. However, in the promotion condition, participants' time 3 levels of quiescence recovered to a level significantly above time 1 $F(1,77) = 4.03, p < .05$, Cohen's $d = .23$.

The following analyses were conducted to determine if the magnitude of the change in emotion from Time 1 to Time 2 varied as a function of experimental condition irrespective of the participants' level of chronic promotion or prevention failure. Four repeated measures analyses were conducted with condition (i.e., promotion, prevention, yoked-control) and time (time 1 vs. time 2) as within-subjects factors. The magnitude of change in quiescence, dejection, agitation, and elation from time 1 to time 2 did not significantly differ as a function of condition, i.e., there were no significant condition x time interactions $F(2,77) = .27, p > .1$; $F(2, 77) = 0.82, p > .1$; $F(2,77) = 0.47, p > .1$; $F(2, 77) = 2.36, p > .1$.

Table 6: Mean Levels of Experienced Emotion Over the Course of the Experiment

Emotion	Promotion			Prevention			Yoked-Control		
	T1	T2	T3	T1	T2	T3	T1	T2	T3
Dejection									
M	1.54 _a	1.85 _b	1.55 _a	1.58 _a	1.85 _b	1.62 _a	1.64 _a	1.82 _b	1.56 _a
SD	0.88	1.00	0.80	0.78	0.79	0.70	0.75	0.89	0.69
Elation									
M	2.77 _a	2.26 _b	2.38 _b	2.87 _a	2.20 _b	2.34 _b	2.82 _a	2.38 _b	2.37 _b
SD	1.00	0.96	1.02	1.04	0.96	1.00	0.96	0.95	1.03
Agitation									
M	1.42 _a	1.46 _a	1.28 _b	1.33 _a	1.35 _a	1.27 _a	1.47 _a	1.43 _a	1.36 _a
SD	0.63	0.65	0.47	0.45	0.52	0.42	0.76	0.60	0.60
Quiescence									
M	3.27 _a	2.88 _b	3.51 _c	3.24 _a	2.92 _b	3.28 _a	3.37 _a	3.09 _b	3.56 _a
SD	0.95	0.98	1.11	0.91	0.95	1.08	0.98	0.97	1.00

Note. T1 = Baseline; T2 = Post-Writing Period, T3 = Post-Meditation Period.

Means in each row not sharing subscripts differ at $p < .05$.

Changes in Experienced Emotion as a Function of Self-Rated Promotion and Prevention Failure

Following previous research on SDT and RFT (Boldero, Morettie, Bell, & Francis 2005), repeated measures analyses of covariance were conducted with condition (i.e. promotion, prevention, yoked-control) and time (e.g., time 1 – agitation and time 2 - agitation) as within-subjects factors and promotion failure and prevention failure as between subjects factors, controlling for the average level of the other emotional responses (e.g., quiescence, dejection, and elation) experienced across the two time points. In addition, of specific interest were the condition x time interactions and goal failure x condition x time interactions. In order to test this three-way interaction, the other possible two-way interaction terms (goal failure x time and goal failure x condition) were also included in the model. In these analyses, a significant promotion or prevention failure x condition x time interaction provides support for the hypothesis that individuals with chronic promotion or prevention failure will respond differently across the experimental conditions. Such a statistically significant interaction indicates that there are either (1) significant changes in the level of emotion from time 1 to time 2 within condition at some level of chronic promotion or prevention failure or (2) significant differences in the magnitude of the change in emotion across conditions at some level of chronic promotion or prevention failure. Interactions were tested using guidelines by Aiken & West, (1991).

Analyses were conducted using Proc Mixed (SAS V9.1), using restricted/residual maximum likelihood estimation. Proc Mixed allows more flexibility than Proc GLM when modeling between and within-subject effects and also allows for the specification of the covariance structures of the data. The following simultaneously assessed fixed effects were obtained using the multivariate unstructured covariance structure after evaluating variance components, Huynh-Feldt, and compound symmetry covariance structures. Significant interactions were probed using contrast analyses of least-squared means of fixed effects.

Differential changes in dejection at varying levels of self-rated promotion failure. Higher average levels of elation ($B = -.19, SE = 0.04, F(1, 75) = 28.47, p < .0001$), and quiescence ($B = -.11, SE = 0.03, F(1, 75) = 11.13, p < .01$) were significantly associated with lower average levels of dejection. Higher average levels of agitation ($B = .28, SE = 0.06, F(1, 75) = 22.63, p < .0001$) were associated with higher average levels of dejection. These variables were included in the model to remove the shared variance between these emotion measures and dejection.

Against predictions, promotion failure ($B = .14, SE = 0.12, F(1, 75) = 1.02, p > .1$) was not associated with dejection, after controlling for other emotions and prevention failure ($B = -.02, SE = 0.09, F(1, 75) = 0.04, p > .1$). Holding constant at their means the level of agitation, quiescence, elation, and prevention failure, there was a significant main effect for time, $F(1, 75) = 4.81, p < .05$; but not for condition, $F(2, 75) = 0.44, p > .1$.

The main effect of time indicated that collapsing across all conditions participants reported a significant increase in dejection from Time 1 ($M = 1.66, SE = 0.06$) to Time 2 ($M = 1.77, SE = 0.07$).

The main effect of time was qualified by a condition \times time interaction, $F(2, 75) = 0.31, p > .1$; a promotion failure \times time interaction, $F(1, 75) = 5.43, p < .05$; a promotion failure \times condition interaction, $F(2, 75) = 0.11, p > .1$; and a significant promotion failure \times condition \times time interaction, $F(2, 75) = 2.49, p < .10$. The promotion failure \times condition \times time interaction was probed at 2 *SDs* below the mean, 1 *SD* below the mean, at the mean, and 1 *SD* above the mean of promotion failure, holding constant the level of elation, agitation, quiescence, and prevention failure at their means. Table 7 summarizes the mean changes in dejection as a function of experimental condition and level of promotion failure.

When writing about past failures to live up to prevention goals, participants who were 2 *SDs* below the mean of promotion failure experienced a significant decrease in dejection from time 1 ($M = 1.75, SE = 0.20$) to time 2 ($M = 1.40, SE = 0.18$), $F(1,75) = 4.16, p < .05$. No other significant changes in dejection from time 1 to time 2 were found at 2 *SDs* below the mean or 1 *SD* below the mean of promotion failure in the promotion, prevention, and yoked-control conditions ($ps > .1$). At 2 *SD* below the mean of promotion failure, the magnitude of the significant decrease in dejection in the prevention condition was marginally different than the magnitude of the decrease in the

yoked-control condition (Δ prevention vs. Δ yoked-control = 0.34, $SE = 0.18$), $t = 1.84$, $df = 75$, $p < .10$, and marginally different from the magnitude of the increase in dejection in the promotion condition (Δ prevention vs. Δ promotion = 0.40, $SE = 0.22$), $t = 1.80$, $df = 1.80$, $p < .10$; there were no significant differences in the magnitude of change in dejection between promotion vs. yoked-control conditions ($p > .1$). At 1 SD below the mean of promotion failure, the magnitude of the increase in dejection in the promotion condition was marginally different than the magnitude of the decrease in the prevention condition (Δ promotion vs. Δ prevention = 0.23, $SE = 0.14$), $t = 1.84$, $df = 75$, $p < .10$; there were no significant differences in the magnitude of change in dejection in prevention vs. yoked-control or promotion vs. yoked-control conditions ($p > .1$).

When writing about past failures to live up to promotion goals, participants who were at the mean and 1 SD above the mean in promotion failure experienced an increase in dejection from time 1 ($M = 1.60$, $SE = 0.09$; $M = 1.63$, $SE = 0.12$, respectively) to time 2 ($M = 1.75$, $SE = 0.10$; $M = 1.82$, $SE = 0.14$, respectively), $F(1,75) = 4.20$, $p < .05$; $F(1,75) = 3.76$, $p < .10$. Similarly, when writing about past failures to live up to prevention goals, participants who were 1 SD above the mean of promotion failure experienced a significant increase in dejection from time 1 ($M = 1.65$, $SE = 0.12$) to time 2 ($M = 1.97$, $SE = 0.11$) $F(1,75) = 8.59$, $p < .01$. At mean of promotion failure, there were no significant differences in the magnitude of change in dejection in any of the possible pairwise comparisons ($ps > .1$). At 1 SD above the mean in promotion failure, the magnitude of the

significant increase in dejection in the prevention condition was marginally different than the increase in the yoked-control condition (Δ prevention vs. Δ yoked-control = $-.21$, $SE = 0.12$), $t = -1.78$, $df = 75$, $p < .10$; there were no significant differences in the magnitude of change in dejection in prevention vs. promotion or promotion vs. yoked-control conditions ($ps > .1$).

Differential changes in elation at varying levels of self-rated promotion failure. Higher average levels of dejection ($B = -.33$, $SE = 0.05$), $F(1, 75) = 45.92$, $p < .0001$ were associated with significantly lower levels of elation. Higher average levels of quiescence ($B = .17$, $SE = 0.04$), $F(1, 75) = 18.66$, $p < .0001$ were associated with significantly higher levels of elation. Higher levels of agitation ($B = .12$, $SE = 0.07$), $F(1, 75) = 3.02$, $p < .10$ were marginally associated with higher levels of elation. As in the previous analyses, these variables were included in the model to remove the shared variance between these emotion measures and elation.

As predicted, higher levels of promotion failure, ($B = -.21$, $SE = 0.13$), $F(1, 75) = 2.93$, $p < .100$ were marginally associated with lower levels of elation, after controlling for other emotions and prevention failure ($B = -.16$, $SE = 0.12$) $F(1, 75) = 1.94$, $p > .1$, which was not significantly associated with elation. Holding constant at their means the level of agitation, dejection, quiescence, promotion failure and prevention failure, there was a significant main effect of time, $F(1, 75) = 44.18$, $p < .0001$; but not for experimental condition, $F(2, 75) = 0.33$, $p > .1$. The main effect of time indicated that collapsing across

all conditions, participants reported a significant decrease in elation from Time 1 ($M = 2.75, SE = 0.08$) to Time 2 ($M = 2.34, SE = 0.08$).

The main effects of time and condition were not qualified by a condition \times time interaction, $F(2, 75) = 2.30, p > .1$; [promotion failure \times time interaction, $F(1, 75) = 1.10, p > .1$; promotion failure \times condition interaction, $F(2, 75) = 0.56, p > .1$]; or promotion failure \times condition \times time interaction, $F(2, 75) = 0.18, p > .1$. The failure to find a condition \times time interaction or a promotion failure \times condition \times time interaction were contrary to predictions. These findings indicate that participants' changes in elation did not vary as a function of experimental condition and that level of self-rated promotion failure did not predict elation within the experimental conditions.

Differential changes in agitation at varying levels of self-rated prevention failure. Higher average levels quiescence ($B = -.18, SE = 0.02$), $F(1, 75) = 66.83, p < .0001$ were significantly associated with lower levels of agitation. Higher levels of dejection ($B = .12, SE = 0.03$), $F(1, 75) = 17.04, p < .0001$ were associated with higher levels of agitation. Higher levels of elation ($B = .05, SE = 0.03$) $F(1, 75) = 3.49, p < .100$ were marginally associated with higher levels of agitation. These variables were included in the model to remove the shared variance between these emotion measures and agitation.

Against predictions, prevention failure ($B = .05, SE = 0.09$), $F(1, 75) = 2.45, p > .1$ was not associated with agitation, after controlling for other emotions and promotion failure ($B = -.05, SE = 0.06$), $F(1, 75) = 0.70, p > .1$. There was a significant main effect for

condition, $F(2, 75) = 4.58, p < .05$, but not for time, $F(1, 75) = 1.93, p > .1$. In these analyses the main effect of condition indicated that participants reported lower average levels of agitation in the prevention condition ($M = 1.33, SE = 0.04$), when compared to the promotion condition ($M = 1.44, SE = 0.06$), $t = -2.21, p < .05$, and the yoked-control condition ($M = 1.46, SE = 0.06$), $t = -2.88, p < .01$. The promotion and yoked-control conditions did not significantly differ, $t = 0.53, p > .1$. However the main effect of condition was not of interest.

As predicted, the main effects of time and condition were qualified by a [condition x time interaction, $F(2, 75) = .29, p > .1$; prevention failure x time interaction, $F(1, 75) = 0.31, p > .1$; prevention failure x condition interactions, $F(2, 75) = 0.30, p > .1$]; marginally significant prevention failure x condition x time interaction, $F(2, 75) = 2.49, p < .10$. The prevention failure x condition x time interaction was probed at 2 *SDs* below the mean, 1 *SD* below the mean, at the mean, and 1 *SD* above the mean of prevention failure, holding constant the level of quiescence, dejection, elation, and promotion failure at their means. Table 7 summarizes the mean changes in agitation as a function of experimental condition and level of prevention failure.

When writing about past failures to live up to promotion goals, participants who were 2 *SDs* and 1 *SD* below the mean of prevention failure experienced a significant decrease in agitation from time 1 ($M = 1.41, SE = 0.14$; $M = 1.43, SE = 0.09$, respectively) to time 2 ($M = 1.15, SE = 0.14$, $M = 1.28, SE = 0.09$, respectively), $F(1,75) = 4.83, p < .05, F(1,75)$

= 4.04, $p < .05$, respectively. No other significant changes in agitation from time 1 to time 2 were found at the mean or 1 *SD* above the mean of prevention failure in the promotion condition ($ps > .1$). Similarly, no significant changes in agitation from time 1 to time 2 were found at different levels of prevention failure in the prevention or yoked-control conditions ($ps > .1$). At 2 *SD* below the mean of prevention failure, the magnitude of the significant decrease in agitation from time 1 to time 2 in the promotion condition was marginally greater than the magnitude of the decrease in the prevention condition (Δ promotion vs. Δ prevention = -0.22, SE = .12), $t = -1.76$, $df = 75$, $p < .10$); there were no significant differences in the magnitude of change in agitation between the promotion vs. yoked-control and prevention vs. yoked-control conditions ($ps > .1$). At 1 *SD* below the mean and at the mean of prevention failure, there were no significant differences in the magnitude of change in agitation between conditions, all pairwise comparisons, $ps > .1$. At 1 *SD* above the mean of prevention failure, the magnitude of the non-significant increase in the promotion condition was marginally different than the magnitude of the non-significant decrease in the yoked-control condition (Δ promotion vs. Δ yoked-control = -0.20, SE = 0.11), $t = -1.82$, $df = 75$, $p < .10$); there was no significant difference in the magnitude of change in agitation between promotion vs. prevention or prevention vs. control conditions ($ps > .1$).

Differential changes in quiescence at varying levels of self-rated prevention failure.

Higher average levels of agitation ($B = -.61$, SE = 0.07), $F(1, 75) = 75.24$, $p < .0001$, and

dejection ($B = -.14$, $SE = 0.05$), $F(1, 75) = 6.63$, $p < .05$ were associated with significantly lower average levels of quiescence, whereas higher average levels of elation ($B = .23$, $SE = 0.04$), $F(1, 75) = 27.91$, $p < .0001$ were associated with significantly higher average levels of quiescence. These variables were included in the model to remove the shared variance between these emotions and quiescence.

Contrary to predictions, prevention failure ($B = .01$, $SE = 0.13$), $F(1, 75) = 0.00$, $p > .1$ was not associated with average levels of quiescence, after controlling for other emotions and for promotion failure ($B = -.13$, $SE = 0.09$), $F(1, 75) = 2.12$, $p > .1$. Holding constant at their means the level of agitation, dejection, elation, promotion failure and prevention failure, there was a significant main effect of time, $F(1, 75) = 6.51$, $p < .05$, as well as a significant effect of condition, $F(2, 75) = 3.68$, $p < .05$. The main effect of time indicated that, collapsing across all conditions, participants reported a significant decrease in quiescence from Time 1 ($M = 3.21$, $SE = 0.07$) to Time 2 ($M = 3.04$, $SE = 0.07$). In these analyses, the main effect of condition indicated that participants reported greater average levels of quiescence in the yoked-control ($M = 3.25$, $SE = 0.07$) condition when compared to the promotion ($M = 3.10$, $SE = 0.08$), $t = 2.02$, $p < .05$, and prevention ($M = 3.04$, $SE = 0.07$), $t = 2.53$, $p < .01$ conditions; however, the main effect of condition was not of interest (except that it suggested the promotion and prevention failure priming conditions may have led to greater subjective distress than the yoked-control condition).

The main effects of time and condition were not qualified by a condition x time interaction, $F(2, 75) = 0.17, p > .1$; [prevention failure x time interaction, $F(1, 75) = 0.05, p > .1$; prevention failure x condition interaction, $F(2, 75) = 0.08, p > .1$] or a prevention failure x condition x time interaction, $F(2, 75) = 0.39, p > .1$. The lack of a statistically significant condition x time interaction or a prevention failure x condition x time interaction were contrary to predictions. These findings indicate that participants' changes in quiescence did not vary as a function of experimental condition and that level of self-rated prevention failure did not predict participants' quiescence during the experimental conditions.

In summary, specificity analyses provided mixed support for the predictions of SDT and RFT (Higgins, 1989, 1996, 1997). The results indicated that participants experienced decreases in quiescence and elation across all experimental conditions. Against predictions, the changes in quiescence and elation did not vary as a function of the experimental manipulation; furthermore, individuals with chronic promotion and prevention failure were not differentially impacted by the experimental manipulation in terms of these emotions. Also against predictions, participants with a high chronic prevention focus did not experience greater increases in agitation in the prevention condition when compared to the other conditions. Unexpectedly, the results did demonstrate that participants low in chronic prevention failure (i.e., prevention success) experienced decreases in agitation when exposed to past promotion goal failures. A

parallel pattern of results was found in for dejection. Participants low in chronic promotion failure experienced decreases in dejection when exposed to past prevention goal failures. As predicted, participants high in chronic promotion failure experienced significant increases in dejection in the promotion and prevention conditions, but not the control condition.

Table 7: Changes in Dejection and Agitation as a Function of Experimental Condition and Level of Self-Regulatory Failure Controlling for Other Experienced Emotions

Level of Failure	Promotion		Prevention		Yoked-Control	
	Time 1	Time 2	Time 1	Time 2	Time 1	Time 2
Promotion Failure	Dejection					
2SDs below the <i>M</i>						
<i>M</i>	1.55	1.60	1.75 _a	1.40 _b	1.58	1.57
<i>SE</i>	0.20	0.22	0.20	0.18	0.18	0.20
1SD below the <i>M</i>						
<i>M</i>	1.57	1.67	1.72	1.59	1.64	1.67
<i>SE</i>	0.13	0.14	0.12	0.11	0.11	0.12
At the <i>M</i>						
<i>M</i>	1.60 _a	1.75 _b	1.68	1.78	1.70	1.78
<i>SE</i>	0.09	0.10	0.08	0.08	0.08	0.08
1SD above the <i>M</i>						
<i>M</i>	1.63 _a	1.82 _b	1.65 _a	1.97 _b	1.77	1.88
<i>SE</i>	0.12	0.14	0.12	0.11	0.11	0.12
Prevention Failure	Agitation					
2SDs below the <i>M</i>						
<i>M</i>	1.41 _a	1.15 _b	1.16	1.12	1.35	1.35
<i>SE</i>	0.14	0.14	0.11	0.12	0.17	0.13
1SD below the <i>M</i>						
<i>M</i>	1.43 _a	1.28 _b	1.26	1.21	1.43	1.38
<i>SE</i>	0.09	0.09	0.07	0.07	0.11	0.08
At the <i>M</i>						
<i>M</i>	1.46	1.41	1.35	1.31	1.51	1.42
<i>SE</i>	0.06	0.06	0.05	0.05	0.08	0.06
1SD above the <i>M</i>						
<i>M</i>	1.48	1.55	1.44	1.40	1.59	1.45
<i>SE</i>	0.09	0.09	0.07	0.07	0.11	0.08

Note. cd < .10. ab < .05. < .01.

Differences in State Rumination Across Conditions

To test the hypothesis that writing about promotion and prevention goal failure would cause greater levels of rumination when compared to writing about yoked-control failure, a repeated measures analysis of variance (ANOVA) was conducted with condition as a within-subject factor and state rumination as the dependent variable. Against predictions, the level of state rumination reported (at time 3 only) after writing about promotion ($M = 2.00$, $SD = 1.56$, Range: 0.00 – 6.00), prevention ($M = 2.15$, $SD = 1.63$, Range: 0.00 – 6.00), and yoked-control failure ($M = 2.11$, $SD = 1.55$, Range: 0.00 – 7.00) did not differ significantly, $F(2,154) = 0.31$, $p > .1$. Likewise, all pairwise differences were non-significant $ps > .1$.

Bivariate Predictors of State Rumination by Condition

The following bivariate analyses were conducted to examine the zero-order predictors of state rumination within each experimental condition prior to testing the hypothesized unique predictors of state rumination. Bivariate analyses in the promotion condition indicated that state rumination was significantly or marginally predicted by, T1-dejection ($r = .35$, $p < .01$), T2-dejection ($r = .30$, $p < .01$), T1-elation ($r = -.19$, $p < .10$), T1-quiescence ($r = -.27$, $p < .01$), trait rumination ($r = .21$, $p < .10$), pessimism ($r = .29$, $p < .01$), and state internal self-awareness ($r = .34$, $p < .01$). State rumination was not significantly predicted by T2-elation, T2-quiescence, T1-agitation, T2-agitation, promotion failure, or

prevention failure ($ps > .1$). Table 8 summarizes the associations among experimental and preliminary assessment variables in the promotion condition.

Bivariate analyses in the prevention condition indicated that state rumination was significantly or marginally predicted by T2-dejection ($r = .26, p < .05$), T2-elation ($r = -.24, p < .05$), T1-quiescence ($r = -.21, p < .10$), T2-quiescence ($r = -.38, p < .001$), T1-agitation ($r = .22, p < .05$), T2-agitation ($r = .22, p < .05$), trait rumination ($r = .32, p < .01$), pessimism ($r = .20, p < .10$), and promotion failure ($r = .26, p < .05$). State rumination was not significantly predicted by T1-dejection, T1-elation, prevention failure, and state internal self-awareness ($ps > .1$). Table 9 summarizes the associations among experimental and preliminary assessment variables in the prevention condition.

Bivariate analyses in the control condition indicated that state rumination was significantly or marginally predicted by T1-dejection ($r = .35, p < .01$), T2-dejection ($r = .26, p < .05$), T2-agitation ($r = .26, p < .05$), trait rumination ($r = .28, p < .01$), pessimism ($r = .19, p < .10$) and state internal self-awareness ($r = .26, p < .05$). State rumination was not significantly predicted by T1-elation, T2-elation, T1-quiescence, T2-quiescence, T1-agitation, promotion failure, or prevention failure ($ps > .1$). Table 10 summarizes the associations among experimental and preliminary assessment variables in the promotion condition.

Table 8: Bivariate Association Among Emotion and Preliminary Assessment Variables in the Promotion Condition

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.
1. T1 Dejection	--																	
2. T2 Dejection	.76 ^d	--																
3. T3 Dejection	.81 ^d	.77 ^d	--															
4. T1 Elation	-.20 [†]	-.33 ^b	-.30 ^b	--														
5. T2 Elation	-.20 [†]	-.52 ^d	-.33 ^b	.59 ^d	--													
6. T3 Elation	-.20 [†]	-.35 ^b	-.30 ^b	.77 ^d	.60 ^d	--												
7. T1 Quiescence	-.47 ^d	-.43 ^d	-.44 ^d	.31 ^b	.21 [†]	.17	--											
8. T2 Quiescence	-.28 ^b	-.36 ^c	-.25 ^a	.16	.25 ^a	.04	.45 ^d	--										
9. T3 Quiescence	-.30 ^b	-.27 ^a	-.36 ^c	.44 ^d	.34 ^b	.29 ^b	.47 ^d	.41 ^c	--									
10. T1 Agitation	.57 ^d	.44 ^d	.41 ^d	-.08	-.09	.00	-.44 ^d	-.37 ^c	-.22 ^a	--								
11. T2 Agitation	.37 ^c	.40 ^c	.24 ^a	-.12	-.12	.08	-.39 ^c	-.50 ^d	-.26 ^a	.70 ^d	--							
12. T3 Agitation	.27 ^a	.12	.17	.00	-.07	.05	-.19	-.21 [†]	-.36 ^c	.50 ^d	.53 ^d	--						
13. State Rumination	.35 ^b	.30 ^b	.33 ^b	-.19 [†]	-.12	-.11	-.27 ^b	-.15	-.35 ^b	.10	.09	.07	--					
14. Trait Rumination	.31 ^b	.26 ^a	.21 [†]	-.21 [†]	-.10	-.29 ^b	-.21 [†]	-.31 ^b	-.32 ^b	.21 [†]	.10	.09	.21 [†]	--				
15. Pessimism	.21 [†]	.23 ^a	.17	-.50 ^d	-.29 ^b	-.39 ^c	-.30 ^b	-.13	-.42 ^d	.09	.11	.15	.29 ^b	.44 ^d	--			
16. Promotion Failure	.16	.19 [†]	.17	-.39 ^c	-.24 ^a	-.23 ^a	-.16	-.29 ^b	-.28 ^b	.16	.26 ^a	.05	.12	.21 [†]	.41 ^d	--		
17. Prevention Failure	.09	.09	.01	-.20 [†]	-.27 ^b	-.15	-.19 [†]	-.18	-.15	.06	.23 ^a	.20 [†]	.16	.20 [†]	.38 ^c	.46 ^d	--	
18. S.I. Self-Awareness	.45 ^d	.14	.35 ^b	.16	.23 ^a	.10	-.17	-.05	-.16	.32 ^b	.23 ^a	.21 [†]	.34 ^b	.02	-.06	.11	.05	--

Note: [†] $p < .10$. ^a $p < .05$. ^b $p < .01$. ^c $p < .001$. ^d $p < .0001$. Sample size = 78. I. Self-Awareness = State Internal Self-Awareness

Table 9: Bivariate Association Among Emotion and Preliminary Assessment Variables in the Prevention Condition

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. T1 Dejection	--												
2. T2 Dejection	.54 ^d	--											
3. T3 Dejection	.68 ^d	.67 ^d	--										
4. T1 Elation	-.38 ^c	-.35 ^b	-.36 ^c	--									
5. T2 Elation	-.24 ^a	-.50 ^d	-.34 ^b	.61 ^d	--								
6. T3 Elation	-.27 ^a	-.46 ^d	-.30 ^b	.58 ^d	.67 ^d	--							
7. T1 Quiescence	-.25 ^a	-.16	-.20 [†]	.26 ^a	.13	.16	--						
8. T2 Quiescence	-.06	-.35 ^b	-.14	.17	.40 ^c	.37 ^c	.38 ^c	--					
9. T3 Quiescence	-.30 ^b	-.33 ^b	-.29 ^b	.40 ^c	.25 ^a	.34 ^b	.39 ^c	.48 ^d	--				
10. T1 Agitation	.14	.26 ^a	.22 ^a	-.04	-.16	-.09	-.33 ^b	-.26 ^a	-.18	--			
11. T2 Agitation	.10	.32 ^b	.16	.04	-.21 [†]	-.09	-.27 ^a	-.55 ^d	-.28 ^b	.51 ^d	--		
12. T3 Agitation	.13	.20 [†]	.21 [†]	-.13	-.09	-.10	-.34 ^b	-.35 ^b	-.48 ^d	.53 ^d	.52 ^d	--	
13. State Rumination	.07	.26 ^a	.23 ^a	-.16	-.24 ^a	-.17	-.21 [†]	-.38 ^c	-.26 ^a	.22 ^a	.22 ^a	.19 [†]	--
14. Trait Rumination	.20 [†]	.23 ^a	.22 ^a	-.17	-.16	.00	-.21 [†]	-.16	-.14	.07	.11	.04	.32 ^b
15. Pessimism	.30 ^b	.35 ^b	.22 ^a	-.39 ^c	-.39 ^c	-.34 ^b	-.21 [†]	-.11	-.39 ^c	.08	.01	.12	.20 [†]
16. Promotion Failure	.07	.33 ^b	.11	-.23 ^a	-.27 ^a	-.22 ^a	-.37 ^c	-.20 [†]	-.23 ^a	.12	.06	.19 [†]	.26 ^a
17. Prevention Failure	.06	.15	-.10	-.14	-.24 ^a	-.13	-.11	-.20 [†]	-.10	.21 [†]	.23 ^a	.18	.12
18. S.I. Self-Awareness	.25 ^a	-.05	.09	.14	.21 [†]	.15	-.05	.11	.06	-.04	-.09	-.05	.13

Note: [†] $p < .10$. ^a $p < .05$. ^b $p < .01$. ^c $p < .001$. ^d $p < .0001$. Sample size = 78. I. Self-Awareness = State Internal Self-Awareness

Table 10: Bivariate Association Among Emotion and Preliminary Assessment Variables in the Control Condition

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. T1 Dejection	--												
2. T2 Dejection	.75 ^d	--											
3. T3 Dejection	.72 ^d	.76 ^d	--										
4. T1 Elation	-.17	-.23 ^a	-.14	--									
5. T2 Elation	-.27 ^a	-.44 ^d	-.25 ^a	.78 ^d	--								
6. T3 Elation	-.22 ^a	-.32 ^b	-.20 [†]	.67 ^d	.64 ^d	--							
7. T1 Quiescence	-.42 ^d	-.36 ^c	-.33 ^b	.32 ^b	.29 ^b	.31 ^b	--						
8. T2 Quiescence	-.24 ^a	-.43 ^d	-.41 ^c	.38 ^c	.51 ^d	.34 ^b	.54 ^d	--					
9. T3 Quiescence	-.13	-.16	-.23 ^a	.28 ^b	.21 [†]	.46 ^d	.40 ^c	.38 ^c	--				
10. T1 Agitation	.46 ^d	.34 ^b	.35 ^b	-.04	-.01	.05	-.43 ^d	-.34 ^b	-.16	--			
11. T2 Agitation	.36 ^c	.42 ^d	.39 ^c	.03	-.12	-.02	-.38 ^c	-.53 ^d	-.16	.69 ^d	--		
12. T3 Agitation	.32 ^b	.37 ^c	.41 ^c	.03	.04	.04	-.28 ^b	-.27 ^a	-.33 ^b	.67 ^d	.60 ^d	--	
13. State Rumination	.35 ^b	.26 ^a	.23 ^a	.07	-.03	-.01	-.17	-.13	-.10	.12	.26 ^a	.17	--
14. Trait Rumination	.37 ^c	.30 ^b	.23 ^a	.04	-.04	-.11	-.18	-.13	-.28 ^b	.09	.16	.27 ^a	.28 ^b
15. Pessimism	.20 [†]	.12	.11	-.25 ^a	-.24 ^a	-.19 [†]	-.16	-.04	-.19 [†]	-.03	-.04	.07	.19 [†]
16. Promotion Failure	.20 [†]	.22 ^a	.19 [†]	-.27 ^a	-.33 ^b	-.21 [†]	-.18	-.25 ^a	-.21 [†]	.10	.04	.11	.03
17. Prevention Failure	.19 [†]	.13	.10	-.25 ^a	-.23 ^a	-.13	-.18	-.13	-.19 [†]	.14	.08	.13	-.05
18. S.I. Self-Awareness	.37 ^c	.16	.25 ^a	.26 ^a	.25 ^a	.26 ^a	-.19 [†]	-.07	-.07	.28 ^b	.15	.14	.26 ^a

Note: [†] $p < .10$. ^a $p < .05$. ^b $p < .01$. ^c $p < .001$. ^d $p < .0001$. Sample size = 78. S.I. Self-Awareness = State Internal Self-Awareness

Unique Predictors of State Rumination

Hierarchical regression analyses were used to test the following hypotheses: That the degree of maladaptive rumination following priming of past failures to attain promotion goals would vary as a function of (a) a participant's trait tendency to engage in rumination and trait pessimism, and (b) the extent to which dejection-related mood increased (or elation-related mood decreased) following failure feedback; and, that the degree of maladaptive rumination following priming of past failures to attain prevention goals would vary as a function of (a) a participant's trait tendency to engage in rumination and trait pessimism, and (b) the extent to which agitation-related mood increased (or quiescence-related mood decreased) following failure feedback. Table 11 summarizes three hierarchical regression analyses that were conducted within each condition with state rumination as the dependent variable, trait rumination and pessimism as predictors entered in step 1, and dejection, elation, quiescence, and agitation entered in step 2.

Promotion condition. The overall model for step 1 was significant, $F(2,77) = 3.89, p < .05, R^2_{Adj.} = .07$. Trait rumination ($\beta = .10, t = 0.84, p > .1, SR^2 = .01$) did not account for a significant unique portion of the variance in state rumination after controlling for the level of pessimism. However, pessimism ($\beta = .25, t = 2.02, p < .05, SR^2 = .05$) accounted for a unique portion of the variance in state rumination after controlling for trait

rumination. The overall model for step 2 was significant, $F(5, 77) = 2.27, p < .05$; however, the $R_{\Delta}^2 = .02$ was not significant $F(4,71) = 1.41, p > .1$. Trait rumination ($\beta = .02, t = 0.15, p > .1, SR^2 = .00$), elation ($\beta = .13, t = 0.95, p > .1, SR^2 = .01$), quiescence ($\beta = -.08, t = -0.60, p > .1, SR^2 = .00$), and agitation ($\beta = -.09, t = -0.69, p > .1, SR^2 = .01$) did not uniquely predict engaging in state rumination, whereas pessimism ($\beta = .25, t = 1.94, p < .10, SR^2 = .04$) and dejection ($\beta = .31, t = 2.21, p < .05, SR^2 = .06$) were marginal and significant unique predictors of state rumination, respectively.

Prevention condition. The overall model for step 1 was significant, $F(2,77) = 4.58, p < .05, R_{Adj.}^2 = .09$. Trait rumination ($\beta = .30, t = 2.44, p < .02, SR^2 = .07$) accounted for a significant portion of the variance in state rumination after controlling for the level of pessimism. However, pessimism ($\beta = .07, t = 0.54, p > .1, SR^2 = .00$) did not account for a significant portion of the variance in state rumination after controlling for trait rumination. The overall model for step 2 was significant, $F(5, 77) = 3.39, p = .0053$, and the $R_{\Delta}^2 = .07$, was also significant $F(4,71) = 2.60, p < .05$. Pessimism ($\beta = .01, t = 0.08, p > .1, SR^2 = .00$), dejection ($\beta = .08, t = 0.65, p > .1, SR^2 = .00$), elation ($\beta = -.03, t = -0.22, p > .1, SR^2 = .00$), and agitation ($\beta = -.00, t = -0.03, p > .1, SR^2 = .00$) did not uniquely predict engaging in state rumination, whereas trait rumination ($\beta = .25, t = 2.11, p < .05, SR^2 = .05$) and quiescence ($\beta = -.30, t = -2.19, p < .05, SR^2 = .05$) were significant unique predictors of state rumination.

Yoked-control. The overall model for step 1 was significant, $F(2, 77) = 3.46, p < .05, R_{Adj}^2 = .06$. Trait rumination ($\beta = .25, t = 2.01, p < .05, SR^2 = .05$) accounted for a significant portion of the variance in state rumination after controlling for the level of pessimism. However, pessimism ($\beta = .08, t = 0.64, p > .1, SR^2 = .00$) did not account for a significant portion of the variance in state rumination after controlling for trait rumination. The overall model for step 2 was marginally significant, $F(5, 77) = 2.14, p < .10$; however the $R_{\Delta}^2 = .02$, was not significant $F(4,71) = 1.44, p > .1$. Trait rumination ($\beta = .15, t = 1.15, p > .1, SR^2 = .02$), pessimism ($\beta = .13, t = 1.02, p > .1, SR^2 = .01$), dejection ($\beta = .16, t = 1.13, p > .1, SR^2 = .02$), elation ($\beta = .08, t = 0.56, p > .1, SR^2 = .00$), quiescence ($\beta = .03, t = 0.19, p > .1, SR^2 = .00$) and agitation ($\beta = -.20, t = 1.44, p > .1, SR^2 = .02$) did not uniquely predict engaging in state rumination.

In summary, at the bivariate level, trait rumination, pessimism, and dejection significantly predicted engagement in state rumination across experimental conditions. In contrast to my predictions, participants with high levels of self-rated promotion and prevention failure did not report a greater tendency to engage in state rumination in the promotion and prevention conditions, respectively. However as predicted, the magnitude of dejection experienced after exposure to past failures to attain promotion goals uniquely predicted engaging in state rumination after controlling for trait rumination, pessimism, quiescence, agitation, and elation. Importantly, quiescence and

agitation were not significant unique predictors of state rumination in the promotion condition. These findings support the assertion that the experience of dejection caused rumination to the degree that it signaled that the participants was not making progress toward promotion goals (Martin & Tesser, 1996). Also as predicted, participants with lower levels of quiescence following exposure to past failures to attain prevention goals engage in greater levels of state rumination. Similarly, it is important to note that dejection and elation were not significant predictors of state rumination in the prevention condition. These findings support the assertion that the experience of low levels of quiescence caused rumination to the degree that it signaled that the participants was not making progress toward prevention goals (Martin & Tesser, 1996). Against predictions, elation and agitation were not significant predictors of engaging in state rumination, in the promotion and prevention conditions respectively.

Table 11: Hierarchical Regression Analyses Predicting State Rumination Experienced During Meditation Period

Predictor	Promotion						Prevention						Yoked-Control					
	Step 1			Step 2			Step 1			Step 2			Step 1			Step 2		
	β	t	SR ²	β	t	SR ²	β	t	SR ²	β	t	SR ²	β	t	SR ²	β	t	SR ²
T. Rumination	.10	0.84	.01	.02	0.15	.00	.30*	2.44	.07	.25*	2.11	.04	.25*	2.01	.05	.15	1.15	.02
Pessimism	.25*	2.02	.05	.25 [†]	1.94	.04	.07	0.54	.00	.01	0.08	.00	.08	0.64	.00	.13	1.02	.01
Dejection				.31*	2.21	.06				.08	0.65	.00				.16	1.13	.02
Elation				.13	0.95	.01				-.03	-0.22	.00				.08	0.56	.00
Quiescence				-.08	-0.60	.00				-.30*	-2.19	.05				.03	0.19	.00
Agitation				-.09	-0.69	.01				.00	-0.03	.00				-.20	1.44	.02
				$R_{Adj.}^2 = .07^*$		$R_{\Delta}^2 = .02$				$R_{Adj.}^2 = .09^*$		$R_{\Delta}^2 = .07^*$			$R_{Adj.}^2 = .06^*$			$R_{\Delta}^2 = .02$

Note: † = $p < .10$; * = $p < .05$. Promotion: Step 1: $F(2,77) = 3.89, p < .05$; Step 2: $F(5, 77) = 2.27, p < .05$. Prevention: Step 1: $F(2,77) = 4.58, p < .05$; Step 2: $F(5, 77) = 3.39, p < .01$. Yoked-Control: Step 1: $F(2,77) = 3.46, p < .05$; Step 2: $F(5, 77) = 2.14, p < .10$. SR² = Squared Semi-Partial Correlation. β = Standardized Regression Coefficient. R² = Adjusted Squared Multiple Correlation Coefficient.

Predicting Intensification in Emotions from Post-Writing Task to Post-Meditation Period

Preliminary analyses were conducted to determine if engaging in state rumination was related to participant's emotional experience during the post-meditation period. These analyses were followed by a series of hierarchical regression analyses were used to determine if state rumination interacted with the level T2-emotion to predict T3-emotion for each emotion within each condition. Main effects for T2-emotion and state rumination were included in step 1, and the state rumination x T2-emotion interaction was added in step 2. All predictor variables were standardized prior to analysis. These analyses tested the hypothesis that engaging in maladaptive rumination following promotion goal failure priming would interact with existing high levels of dejection or low levels of elation, resulting in intensification and prolonging of that negative mood state. Similarly, it was predicted that engaging in maladaptive rumination following prevention goal failure priming would interact with existing high levels of agitation or low levels of quiescence, resulting in intensification and prolonging of that negative mood state.

Bivariate associations between state rumination and T3-affect. Within the promotion condition, state rumination was significantly correlated with T3-dejection ($r = .33, p < .01$), and T3-quiescence ($r = -.35, p < .01$), but was not significantly correlated with T3-agitation or T3-elation ($ps > .1$). In the prevention condition, state rumination was significantly or marginally correlated with T3-dejection ($r = .23, p < .05$), T3-agitation ($r =$

.19, $p < .10$), and T3-quiescence ($r = -.26, p < .05$), but was not significantly correlated with T3-elation ($p > .1$). In the control condition, state rumination was significantly correlated with T3-dejection ($r = .23, p < .05$) but was not significantly correlated with T3-elation, T3-quiescence, or T3-agitation ($ps > .1$).

Intensification of affect in the promotion condition. T2-dejection accounted for 59% of the variance in T3-dejection, $r = .77, p < .0001$. The overall model for step 1 was significant $F(2,77) = 57.57, p < .0001, R_{Adj}^2 = .60$; a significant main effect for T2-dejection was found ($\beta = .74, t = 9.75, p < .0001, SR^2 = .50$), however, no main effect for state rumination was found ($\beta = .10, t = 1.32, p > .1, SR^2 = .01$). The overall model for step 2 was significant $F(3,77) = 45.67, p < .0001, R_{\Delta}^2 = .04$; main effects for T2-dejection ($\beta = .65, t = 8.32, p < .0001, SR^2 = .33$) and state rumination ($\beta = .12, t = 1.50, p > .1, SR^2 = .01$) were qualified by a state rumination \times T2-dejection interaction ($\beta = .23, t = 3.04, p < .01, SR^2 = .04$). To probe the interaction, I examined the differences in the association between state rumination and T3-dejection as a function of T2-dejection. Following the method of Aiken & West (1991), I computed slopes of state rumination predicting T3-dejection for low ($-1 SD$), moderate (at the mean), and high ($+1 SD$) levels of T2-dejection. State rumination significantly predicted higher levels of T3-dejection only for participants who reported high levels of T2-dejection ($\beta = .26, t = 3.15, p < .01$). State rumination did not significantly predict T3-dejection for participants experiencing moderate ($\beta = .09, t = 1.50, p > .1$), or low ($\beta = -.09, t = -1.08, p > .1$) levels of T2-dejection (see Figure 1).

T2-elation accounted for 36% of the variance in T3-elation, $r = .60, p < .0001$. The overall model for step 1 was significant $F(2,77) = 21.60, p < .0001, R_{Adj.}^2 = .35$; a significant main effect for T2-elation was found ($\beta = .60, t = 6.46, p < .0001, SR^2 = .35$), however, no main effect for state rumination was found ($\beta = -.03, t = -0.43, p > .1, SR^2 = .00$). The overall model for step 2 was significant $F(3,77) = 15.21, p < .0001, R_{\Delta}^2 = .01$; main effects for T2-elation ($\beta = .59, t = 6.36, p < .0001, SR^2 = .34$) and state rumination ($\beta = -.02, t = -0.20, p > .1, SR^2 = .00$) were not qualified by a state rumination \times T2-elation interaction ($\beta = .12, t = 1.38, p > .1, SR^2 = .02$).

T2-quiescence accounted for 16% of the variance in T3-quiescence, $r = .41, p < .001$. The overall model for step 1 was significant $F(2,77) = 12.80, p < .0001, R_{Adj.}^2 = .23$; a significant main effects for T2-quiescence ($\beta = .37, t = 3.64, p < .001, SR^2 = .13$) and state rumination were found ($\beta = -.29, t = -2.92, p < .01, SR^2 = .08$). The overall model for step 2 was significant $F(3,77) = 8.52, p < .0001, R_{\Delta}^2 = .00$; main effects for T2-dejection ($\beta = .37, t = 3.65, p < .001, SR^2 = .13$) and state rumination ($\beta = -.29, t = -2.84, p < .01, SR^2 = .08$) were not qualified by a state rumination \times T2-quiescence interaction ($\beta = .04, t = 0.47, p > .1, SR^2 = .00$).

T2-agitation accounted for 27% of the variance in T3-agitation, $r = .53, p < .0001$. The overall model for step 1 was significant $F(2,77) = 14.34, p < .0001, R_{Adj.}^2 = .26$; a significant main effect for T2-agitation was found ($\beta = .52, t = 5.31, p < .0001, SR^2 = .27$), however, no

main effect for state rumination was found ($\beta = .02, t = 0.25, p > .1, SR^2 = .00$). The overall model for step 2 was significant $F(3,77) = 9.56, p < .0001, R_{\Delta}^2 = .01$; main effects for T2-agitation ($\beta = .53, t = 5.30, p < .0001, SR^2 = .27$) and state rumination ($\beta = .03, t = 0.27, p > .1, SR^2 = .00$) were not qualified by a state rumination \times T2-agitation interaction ($\beta = -.05, t = -.54, p > .1, SR^2 = .00$).

Intensification of affect in the prevention condition. T2-dejection accounted for 45% of the variance in T3-dejection, $r = .67, p < .0001$. The overall model for step 1 was significant $F(2,77) = 30.61, p < .0001, R_{Adj.}^2 = .43$; a significant main effect for T2-elation was found ($\beta = .65, t = 7.33, p < .0001, SR^2 = .39$), however, no main effect for state rumination was found ($\beta = .06, t = 0.71, p > .1, SR^2 = .00$). The overall model for step 2 was significant $F(3,77) = 21.40, p < .0001, R_{\Delta}^2 = .01$; main effects for T2-dejection ($\beta = .66, t = 7.47, p < .0001, SR^2 = .40$) and state rumination ($\beta = .09, t = 0.96, p > .1, SR^2 = .01$) were not qualified by a state rumination \times T2-dejection interaction ($\beta = -.13, t = -1.45, p > .1, SR^2 = .02$).

T2-elation accounted for 45% of the variance in T3-elation, $r = .67, p < .0001$. The overall model for step 1 was significant $F(2,77) = 30.51, p < .0001, R_{Adj.}^2 = .43$; a significant main effect for T2-elation was found ($\beta = .67, t = 7.54, p < .0001, SR^2 = .42$), however, no main effect for state rumination was found ($\beta = -.02, t = -0.18, p > .1, SR^2 = .00$). The overall model for step 2 was significant $F(3,77) = 20.31, p < .0001, R_{\Delta}^2 = .00$; main effects

for T2-elation ($\beta = .67, t = 7.52, p < .0001, SR^2 = .42$) and state rumination ($\beta = .01, t = 0.06, p > .1, SR^2 = .00$) were not qualified by a state rumination \times T2-elation interaction ($\beta = .05, t = 0.63, p > .1, SR^2 = .00$).

T2-quiescence accounted for 22% of the variance in T3-quiescence, $r = .48, p < .0001$. The overall model for step 1 was significant $F(2,77) = 11.52, p < .0001, R_{Adj.}^2 = .21$; a significant main effect for T2-quiescence was found ($\beta = .44, t = 4.05, p < .0001, SR^2 = .18$), however, no main effect for state rumination was found ($\beta = -.09, t = -0.86, p > .1, SR^2 = .01$). The overall model for step 2 was significant $F(3,77) = 7.94, p < .0001, R_{\Delta}^2 = .00$; main effects for T2-quiescence ($\beta = .45, t = 4.12, p < .0001, SR^2 = .17$) and state rumination ($\beta = -.07, t = -0.64, p > .1, SR^2 = .00$) were not qualified by a state rumination \times T2-quiescence interaction ($\beta = .09, t = 0.91, p > .1, SR^2 = .01$).

T2-agitation accounted for 27% of the variance in T3-agitation, $r = .52, p < .0001$. The overall model for step 1 was significant $F(2,77) = 14.71, p < .0001, R_{Adj.}^2 = .26$; a significant main effect for T2-agitation was found ($\beta = .51, t = 5.06, p < .0001, SR^2 = .24$), however, no main effect for state rumination was found ($\beta = .08, t = 0.82, p > .1, SR^2 = .01$). The overall model for step 2 was significant $F(3,77) = 10.52, p < .0001, R_{\Delta}^2 = .01$; main effects for T2-agitation ($\beta = .52, t = 5.16, p < .0001, SR^2 = .25$) and state rumination ($\beta = .08, t = 0.80, p > .1, SR^2 = .01$) were not qualified by a state rumination \times T2-agitation interaction ($\beta = -.13, t = 0.18, p > .1, SR^2 = .02$).

Intensification of affect in the yoked-control condition. T2-dejection accounted for 57% of the variance in T3-dejection, $r = .76$, $p < .0001$. The overall model for step 1 was significant $F(2,77) = 50.71$, $p < .0001$, $R^2_{Adj.} = .56$; a significant main effect for T2-dejection was found ($\beta = .75$, $t = 9.58$, $p < .0001$, $SR^2 = .52$), however, no main effect for state rumination was found ($\beta = .04$, $t = 0.57$, $p > .1$, $SR^2 = .00$). The overall model for step 2 was significant $F(3,77) = 34.61$, $p < .0001$, $R^2_{\Delta} = .01$; main effects for T2-dejection ($\beta = .73$, $t = 9.35$, $p < .0001$, $SR^2 = .49$) and state rumination ($\beta = .06$, $t = 0.74$, $p > .1$, $SR^2 = .00$) were not qualified by a state rumination x T2-dejection interaction ($\beta = .09$, $t = 1.27$, $p > .1$, $SR^2 = .01$).

T2-elation accounted for 40% of the variance in T3-elation, $r = .64$, $p < .0001$. The overall model for step 1 was significant $F(2,77) = 26.22$, $p < .0001$, $R^2_{Adj.} = .40$; a significant main effect for T2-elation was found ($\beta = .64$, $t = 7.24$, $p < .0001$, $SR^2 = .41$), however, no main effect for state rumination was found ($\beta = .02$, $t = 0.18$, $p > .1$, $SR^2 = .00$). The overall model for step 2 was significant $F(3,77) = 17.28$, $p < .0001$, $R^2_{\Delta} = -.01$; main effects for T2-elation ($\beta = .64$, $t = 7.15$, $p < .0001$, $SR^2 = .41$) and state rumination ($\beta = .02$, $t = 0.17$, $p > .1$, $SR^2 = .00$) were not qualified by a state rumination x T2-elation interaction ($\beta = .02$, $t = 0.24$, $p > .1$, $SR^2 = .00$).

T2-quiescence accounted for 13% of the variance in T3-quiescence, $r = .38$, $p < .001$. The overall model for step 1 was significant $F(2,77) = 6.29$, $p < .01$, $R^2_{Adj.} = .12$; a

significant main effect for T2-quiescence was found ($\beta = .37, t = 3.42, p < .0001, SR^2 = .13$), however, no main effect for state rumination was found ($\beta = -.05, t = -0.50, p > .1, SR^2 = .00$). The overall model for step 2 was significant $F(3,77) = 4.52, p < .01, R_{\Delta}^2 = .00$; main effects for T2-quiescence ($\beta = .37, t = 3.42, p < .0001, SR^2 = .13$) and state rumination ($\beta = -.08, t = -0.62, p > .1, SR^2 = .00$) were not qualified by a state rumination x T2-quiescence interaction ($\beta = .11, t = 0.99, p > .1, SR^2 = .01$).

T2-agitation accounted for 35% of the variance in T3-agitation, $r = .60, p < .0001$. The overall model for step 1 was significant $F(2,77) = 20.65, p < .0001, R_{Adj.}^2 = .34$; a significant main effect for T2-agitation was found ($\beta = .59, t = 6.16, p < .0001, SR^2 = .33$), however, no main effect for state rumination was found ($\beta = .02, t = 0.16, p > .1, SR^2 = .00$). The overall model for step 2 was significant $F(3,77) = 13.70, p < .0001, R_{\Delta}^2 = -.01$; main effects for T2-agitation ($\beta = .58, t = 5.71, p < .0001, SR^2 = .28$) and state rumination ($\beta = .02, t = 0.22, p > .1, SR^2 = .00$) were not qualified by a state rumination x T2-agitation interaction ($\beta = .05, t = 0.48, p > .1, SR^2 = .00$).

Overall, engaging in state rumination was associated with higher levels of dejection and was unrelated to elation across all three experimental conditions. In addition, engaging in state rumination was associated with lower levels of quiescence in both the promotion and prevention condition, but not the control condition. Engaging in state rumination was also associated with higher levels of agitation in the prevention condition, but not the promotion or control conditions. As predicted, in the promotion

condition, state rumination interacted with high levels of T2-dejection to predict intensifications in dejection. At moderate to low levels of T2-dejection state rumination was unrelated to T3-dejection. Unexpectedly, state rumination also predicted residual change in T3-quiescence. Against predictions, state rumination did not interact with low levels of elation to predict further decreases in elation. Also against predictions, state rumination did not predict lower levels of quiescence or intensifications in agitation.

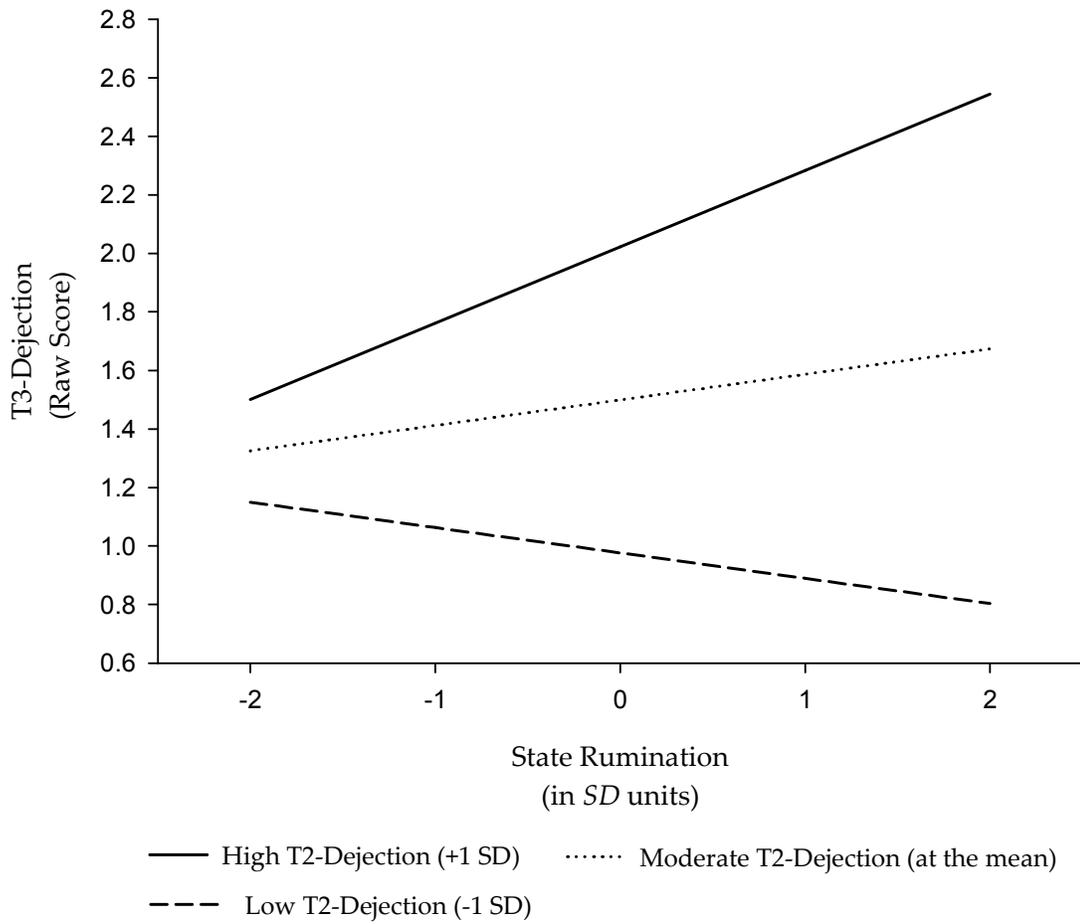


Figure 1: Level of T2-Dejection Present Following Writing About Promotion Failure Moderates the Effect of State Rumination on T3-Dejection

DISCUSSION

The aim of this experimental study was to clarify the predictors and emotional consequences of engaging in maladaptive rumination following a priming manipulation in which participants were asked to reflect upon experiences in which they failed to attain promotion or prevention goals. The results provided qualified support for the prediction that recollections of failure to meet motivationally significant goals would cause predictable changes in affect (hypothesis 1). It also was observed that under specific conditions, the magnitude of the affect experienced following failure feedback, trait pessimism, and trait rumination predicted increased engagement in maladaptive rumination (hypothesis 2). Furthermore, engaging in maladaptive rumination following exposure to past failures to meet promotion goals interacted with high levels of existing dejection to predict intensifications in dejection (hypothesis 4). However, exposure to past failures to attain promotion or prevention goals did not result in greater experiences of maladaptive rumination when compared to exposure to failure to attain yoked-control goals (hypothesis 3). To my knowledge, this is the first experimental investigation to examine the functional associations among promotion and prevention goal failure, maladaptive rumination, and distress.

Overall, the results demonstrated that integrating models of self-regulation (Carver & Scheier, 1981, 1990, 1998, 1999; Higgins, 1996, 1997, 1998) with theories of

ruminative thought processes (Martin & Tesser, 1989, 1996, 2006; Nolen-Hoeksema & Morrow, 1991) may provide a better understanding of both phenomena. Specifically, the results help clarify the conditions that cause an individual to engage in maladaptive rumination. In addition, the results provide a critical starting point in understanding how the experience of acute dejection following failure to meet promotion goals becomes intensified and prolonged. In the remainder of this section, I discuss the implications of these findings, as well as the relative strengths and limitations of the study.

Affective Consequences of Promotion and Prevention Failure

At the beginning of the experimental manipulation, participants manifested equivalent levels of internal self-focus in all three priming conditions. In addition, the priming conditions did not vary with regard to the level of internal focus induced during exposure to past failure situations. Therefore, any priming-related differences in rumination or affect that we observed were not simply due to the degree of internal self-awareness induced, which has been implicated as a mechanism in the generation of negative affect (Duval & Wicklund, 1972).

In accordance with regulatory focus theory, I predicted that failure to attain promotion goals would be associated with an increase in dejection-related emotions and a decrease in elation-related emotions (Hypothesis 1a; Higgins, 1987, 1996, 1997, 1998). Replicating previous correlational findings, cross-sectional analyses within the initial

assessment demonstrated that promotion failure was specifically related to depressive symptoms whereas prevention failure was not. In addition, results from the experimental manipulation check demonstrated that individuals recalled experiencing more dejection in association with past failures to attain promotion goals, compared to past failures to meet prevention or yoked-control goals. The experimental data also demonstrated that participants who reported moderate to high levels of chronic promotion failure were more vulnerable to experiencing increases in dejection when a sense of promotion failure was activated by increasing the accessibility of past promotion failures. Interestingly, participants with high levels of chronic promotion failure also experienced increases in dejection when accessibility of past prevention failures was increased. Also of note, participants low in promotion failure experienced a significant decrease in dejection when they wrote about past failures to meet prevention goals.

These findings are consistent with the assertion that promotion and prevention goals are representations within larger networks of self-regulatory beliefs, where activation of one goal can result in spreading activation to others (Strauman, 1989). In addition, chronic promotion failure appears to be a robust vulnerability factor for the experience of dejection, such that even indirect activation via exposure to prevention goal failure also causes increases in dejection. The findings also suggest that individuals may self-regulate following exposure to past prevention failures by drawing on

successes within the promotion domain resulting in a decrease in dejection. The specificity of these findings is bolstered by results indicating that regardless of the level of promotion failure, no participant experienced significant changes in dejection when writing about yoked-control attributes.

Specificity analyses did not demonstrate that the observed decrease in elation-related emotions was unique to being exposed to past failures to meet promotion goals. Results indicated that all conditions experienced a significant decrease in elation after exposure to past goal failure. However, there was a trend for promotion failure to be uniquely associated with lower levels of elation regardless of exposure condition. This pattern of findings did not hold for prevention failure. It should be noted that since relatively few studies of SDT or RFT have reported measures of elation, it is difficult to know whether our lack of significant findings for this measure is meaningful.

In terms of self-regulation in response to prevention goal failure feedback, it was predicted that failure to attain prevention goals would be associated with an increase in agitation-related emotions and a decrease in quiescence-related emotions (Hypothesis 1b; Higgins, 1987, 1996, 1997, 1998). Contrary to predictions, cross-sectional results indicated that prevention failure was not discriminantly associated with anxious symptoms, whereas promotion failure was marginally associated with anxious symptoms. However, results from the manipulation check indicated that students recalled experiencing more agitation-related emotions associated with anger (e.g.,

agitated, annoyed, and aggravated) during past failures to meet prevention goals compared to past failures meet yoked-control attributes. Furthermore, participants' written summaries of past failures to meet prevention goals contained more agitation-related emotions associated with anger compared to written summaries of promotion failure.

Contrary to predictions, specificity analyses did not detect the expected increase in agitation-related emotions following exposure to past failures to meet prevention goals at any level of prevention failure. Unexpectedly, and in direct parallel to results in the promotion condition, participants low in prevention failure experienced a decrease in agitation when they wrote about past failures to meet promotion goals. These results suggest that individuals may self-regulate when exposed to past failure to meet promotion goals by focusing on past successes in the prevention domain, resulting in a decrease in agitation. Results also indicated that all conditions demonstrated a significant decrease in quiescence after exposure to past goal-failure.

Overall, this study partially replicated the large body of evidence supporting RFT's assertion that promotion failure is specifically related to increased dejection-related, and to a lesser extent decreased elation-related, emotions. However, the observed trend for promotion failure to predict anxious symptoms after controlling for prevention failure and depressive symptoms was inconsistent with predictions. These findings might be attributable to instrumentation effects as well as to the

phenomenology of anxiety. The STAI measures both physiological aspects of anxiety (e.g., jittery) and affect associated with the absence of positive emotions associated with depression (Clark & Watson, 1991) that are not measured by the BDI (e.g., “joyful, pleasant, and self-confident”). Therefore, the residual variance in anxiety scores (resulting from partialling out depressive symptoms and prevention failure) may still contain variance associated with elated mood, which in theory would be associated with promotion failure.

Of greater concern was the failure to convincingly replicate the association between prevention failure and agitation-related and quiescence-related emotions. It is noteworthy that the participants in the current sample considered their prevention goals as being less central to their self-concept (i.e., less important) than their promotion goals. In addition, students reported that on average they were less discrepant from prevention goals than promotion goals. According to RFT, these are two factors that are directly implicated in determining the intensity of a person’s emotional responses to self-regulation. Thus, these findings serve as a potential explanation for why the affective predictions based on regulatory focus theory were more evident in the promotion condition than the prevention condition.

Furthermore, as Brunch et al. (2000) argued, the inability to find a relationship between prevention failure and agitation-related emotions may have resulted from a failure of measurement to adequately capture lower thresholds of anxiety. Clark and

Watson (1991) demonstrated that in subclinical samples the association between anxiety scores and other variables tends to become more attenuated when compared to measures of depression and other variables. This attenuation is believed to occur because anxiety scale items typically consist of somatic complaints that are unlikely to be endorsed unless one is highly and chronically aroused (Brunch et al, 2000; Clark & Watson, 1991). In the current study, only 9% students scored within the range of STAI scores typical of a clinically anxious sample (Spielberger et al., 1970). Similarly, the composite measure of agitation used during the experiment also assessed somatic and mood adjectives (e.g., jittery, shaky, afraid) that are unlikely to be endorsed in the absence of being highly aroused. This explanation becomes more plausible in light of results indicating that prevention failure was specifically associated with agitation-related emotions such as anger that require less arousal to be endorsed (e.g., agitated, annoyed, aggravated). Regrettably, we did not assess the degree to which student re-experienced agitation-related emotions associated with anger during the experimental manipulation. Future investigations of regulatory focus theory with normal populations should include measures sensitive enough to detect subtle changes in of agitation that occur when a person is not highly and chronically aroused.

One reason why the hypothesized differences were not all observed is that participants responded to the yoked-control condition differently than expected. It was predicted that the participants writing about failing to live up to attributes that were

someone else's promotion or prevention goals would not demonstrate significant changes in positive or negative affect because those attributes had no motivational significance for the target participant. However, the yoked-control condition on average led to a significant decrease in elation and quiescence and a significant increase in dejection. No significant changes in agitation occurred, but the same was true for the promotion and prevention conditions. We can speculate that the demands of the writing task forced participants to generate situations where they indeed failed in some way, even if the particular life event was not related to a personal goal. In this regard, it was interesting to note that during the experiment a small portion of participants engaging in the yoked-control condition exited their private rooms and told research assistants that they were having difficulties generating situations, presumably because the attributes about which they had been asked to write did not have personal meaning. These participants were instructed to do their best and apparently they did so. Therefore, it is probable that the results involving comparisons between promotion and yoked-control conditions and between the prevention and yoked-control conditions are attenuated.

Engagement in Maladaptive Rumination

According to control theory (Carver & Scheier, 1999) and the goal progress theory of rumination (Martin & Tesser, 1989; 1996; 2006), an inability to reduce a discrepancy between a current state and a future desired end-state generates negative

affect and increased doubt, which, combined with an inability to disengage from the goal/standard, generates a “commitment to unattainable goals” that leads to maladaptive rumination and distress (Carver & Scheier, 1999; p.44). Cross-sectional results from the initial assessment indicated that perceived discrepancies between one’s current state and one’s aspirations for the self or one’s sense of duties and responsibilities were strongly associated with low expectancies of being able to attain those goals in the future (i.e., pessimism/doubt) as well as higher levels of trait pessimism. It is likewise important to note that promotion and prevention goals are at the highest levels of a person’s goal hierarchy and hence are more difficult to disengage from when facing failure (Carver & Scheier, 1999).

Taken together, the theories that formed the basis for this study and the findings from the assessment and experimental sessions suggest that the experience of promotion or prevention failure can, under certain circumstances, lead to maladaptive rumination. However, in contrast to our predictions, exposure to past failures to meet promotion or prevention goals did not produce uniformly higher levels of maladaptive rumination compared to the yoked-control condition (hypothesis 2). As suggested above, these findings may not represent a completely valid test of our hypothesis. In contrast to our intent, the yoked-control condition was not motivationally inert due to the demand that participants generate personal past failure experiences. Having what turned out to be an active control condition may have reduced our ability to find subtle but statistically

significant differences across the priming conditions. However, some indirect support for this prediction was obtained when examining the predictors of maladaptive rumination within each experimental condition. Theoretically (Klinger, 1977, Martin & Tesser, 1996; Wyer & Srull, 1989), in the absence of a direct state measure of promotion failure, the magnitude of sadness and elation experienced post-writing offers a reasonable assessment of the level of experienced promotion failure during the experiment. Likewise, the magnitude of agitation and quiescence experienced provides a reasonable assessment of the level of experienced prevention failure.

Following this logic, our results did demonstrate that the magnitude of dejection experienced post-exposure to promotion failure and a trait tendency to be more pessimistic uniquely predicted a tendency to engage in maladaptive rumination. Also as predicted, quiescence and agitation did not uniquely predict engagement in maladaptive rumination in the promotion condition. In the prevention condition, results indicated that lower levels of quiescence experienced post-exposure to prevention failure and a tendency to engage in trait rumination both uniquely predicted a greater tendency to engage in maladaptive rumination. However, agitation and a trait tendency to be pessimistic did not uniquely predict a greater tendency to engage in maladaptive rumination in the prevention condition.

The patterns of results obtained in the promotion and prevention conditions, in combination with the lack of unique predictors in the yoked-control condition, provide a

measure of support for the discriminant validity of these findings. Specifically, exposure to past failures to attain goals associated with nurturance, advancement, and growth resulted in sadness, which in combination with higher levels of trait pessimism predicted an increased tendency to engage in maladaptive rumination. Alternatively, exposure to past failures to attain goals associated with safety and security resulted in less quiescence, which in association with a trait tendency to ruminate predicted increased tendency to engage in maladaptive rumination.

These discriminant findings are consistent other studies which indicate that failure to attain self-definitional goals results in maladaptive rumination (Brunstein & Gollwitzer, 1996; Emmons & King, 1988; Lavalle & Campbell, 1995). These findings are also consistent with response styles theory (Nolen-Hoeksema, 1991); experiencing sadness and lower levels of quiescence may have prompted students to focus their attention on the possible causes and consequences of this change in emotion (Nolen-Hoeksema et al., 1993). In addition, the specificity of the results provides evidence to support self-regulatory explanations (Pyszczynski & Greenberg, 1987; Woody & Rachman, 1994) of why rumination relates to both depression and anxiety (Blagden & Craske, 1996; Segerstrom et al., 2000; Thomsen, 2006). From the combined theoretical perspective on which this research was based, it can be asserted that it is not rumination that determines affective responses to failure, but rather, the type of goal failure

experienced by the individual that determines both the type of affect experienced and the likelihood of maladaptive rumination post-failure.

Affective Consequences of Engaging in Maladaptive Rumination

As a number of theorists have suggested, rumination does not directly cause negative affect. Rather, it causes continued activation of a perceived discrepancy between the current state of being and the chosen goal, thus causing the goal to remain salient and the perceived discrepancy to remain emotionally distressing (Martin & Tesser, 1996). This begins a cyclic process wherein continued indirect and direct cueing of the discrepancy generates more intense negative affect and increasing levels of maladaptive rumination. In such a state of rumination, the individual is no longer actively producing solution strategies but is likely to be thinking about the goal object and his/her feelings regarding the object. This process can cause the polarization of existing negative affect, such that feelings that are initially negative become more negative (Tesser, 1976; Millar & Tesser, 1986).

Consistent with theory and predictions, maladaptive rumination had a clear polarizing effect on dejection in the promotion condition. Specifically, only individuals who experienced high levels of dejection in the promotion failure condition experienced an intensification in dejection the more they engaged in maladaptive rumination (Hypothesis 4). These results are consistent with prior studies of the impact of rumination on sadness, which indicate that rumination intensifies sadness but only for

individuals who are dysphoric (Thomsen, 2006). These findings are also consistent with the outcome of a quantitative review of the private self-awareness literature, which indicated that increasing self-awareness resulted in a heightening of pretest emotion (Fejfar & Hoyle, 2000).

Interestingly, in the promotion condition, engaging in state rumination predicted lower levels of quiescence after controlling for baseline quiescence, irrespective of the level of quiescence experienced after exposure to failure. This is consistent with previous research indicating that ruminators reported experiencing greater intensifications in anxiety and worry than individuals who engaged in distraction (Vickers & Vogeltanz-Holm 2003). Our results suggest that the process of engaging in rumination also intensifies anxiety and perhaps causes individuals to worry. This may be a function of metacognitions associated with engaging in rumination. Research has demonstrated that individuals may experience rumination as uncontrollable and harmful, and may believe that it is likely to produce detrimental personal as well as social consequences (Martin & Tesser, 1989; Papageorgiou & Wells, 2003, 2004; Segerstrom et al., 2000; Wells, 2000; Wells & Matthews, 1994). These types of metacognitions have been more closely associated with an increased tendency to worry rather than engaging in rumination (Watkins, 2004).

The intensification hypothesis for maladaptive rumination in the prevention condition was not supported. That is, maladaptive rumination did not interact with

post-exposure emotion to predict intensifications in negative or reductions in positive emotions. Neither did maladaptive rumination uniquely intensify negative or reduced positive emotions after controlling for post-exposure emotion. As expected, in the control condition, maladaptive rumination did not interact with post-exposure emotion to predict intensifications in negative or reductions in positive emotions, and neither did maladaptive rumination predict intensifications in negative or reductions in positive emotions after controlling for post-exposure emotion. However, we have only limited ability to interpret such negative findings in the control condition.

Given that exposure to past failures to live up to prevention goals did lead to an increase in agitation-related emotions associated with anger, it is possible that the failure to find intensifications in agitation or decreases in quiescence resulted from not specifically measuring the degree to which participants engaged in rumination on anger. In adolescent populations, rumination on anger (but not rumination on sadness) was a significant predictor of anger, overt aggression, and relational aggression (Peled & Moretti, 2007). In adults, experimental studies have demonstrated that rumination in response to anger intensifies anger, whereas engaging in distraction resulted in no change or a decrease in anger (Rusting & Nolen-Hoeksema, 1998). Of note, Nolen-Hoeksema and colleagues also demonstrated that, when given the option, women chose to avoid the experience of anger by engaging in distracting tasks rather than ruminating on anger, whereas men showed no preference (Rusting & Nolen-Hoeksema, 1998). In the

current investigation, participants were not constrained to engage in a particular cognitive task. However, given that 79% of the sample was female, it is probable that our null findings could be due in part to an increased use of distraction during this condition.

It is important to note that while intensifications in dejection were detected for participants who engage in maladaptive rumination in the presence of high levels of dejection during the quiet meditation period, this was not universally the case. Across all conditions, engaging in a 5-minute meditation period after writing about past failures resulted on average in a reversal of changes in quiescence and dejection. Interestingly, engaging in meditation did not increase participants' levels of elation, so there was little evidence to suggest that over the course of the study participants were simply regressing to the mean or reporting uniformly lower levels of all emotions.

Strengths and Limitations

Several strengths of the current investigation warrant mentioning. First, this study was unique in that we directly exposed participants to personal failures to attain self-definitional goals to examine the role of self-regulation-related failure feedback in generating maladaptive rumination. While several theorists (Carver & Scheier, 1999; Martin & Tesser, 1989; 1996) have posited that frustrated goal pursuit leads to rumination, very few investigations have directly tested this assertion (for exceptions see Brunstein & Gollwitzer, 1996; Emmons & King, 1988; and Lavalley & Campbell, 1995).

Second, to our knowledge this was the first experimental study seeking to induce specific emotional experiences of dejection and agitation through writing about past failures to attain goals associated with growth and nurturance as well as goals associated with safety and security, in order to examine their relationship to maladaptive rumination. As suggested by Segerstrom et al. (2000), clarifying the associations among types of goal failure, the kinds of negative affect produced, and repetitive thought can also provide useful information regarding the observed overlap between repetitive thought and anxiety and depression. Specifically, Segerstrom et al. (2000) proposed that depressive rumination may result from a failure to attain goals of emotional security or self-identity (Davey, 1994; Martin & Tesser, 1989, 1996; Pyszczynski & Greenberg, 1987). Conversely, worry may result from failure to attain goals of safety and security (Dugas, Freeston, & Ladouceur, 1997; Woody & Rachman, 1994).

Third, unlike many previous investigations which attempt to directly induce rumination by having individuals focus on their thoughts and feelings (e.g., Lavender & Watkins, 2004; Lyubomirsky et al., 1999; Rusting & Nolen-Hoeksema, 1998), we let this process naturally unfold while measuring its occurrence. This was intended to provide a more ecologically valid experimental analog of the rumination process, which has been conceptualized as being both uncontrollable and intrusive (Martin & Tesser, 1996;

Trapnell & Campbell, 1999) and as an intentional form of coping with negative affect (Nolen-Hoeksema, 1991).

Several limitations of the current study should also be noted. Those limitations fall within the following areas: sample composition, experimental manipulation, and assessment. Our sample was comprised of graduate/professional students seeking masters and doctoral degrees from a prominent private university. This sample was therefore inherently more highly educated and more intelligent than the population to whom we would like to generalize these findings. Enrollment statistics indicated that these students typically score above the 85th percentile on the verbal and the 80th percentile on the quantitative portion of the Graduate Record Examination Test. The possession of greater verbal ability would have actually facilitated participants' ability to complete the verbal comprehension and writing demands of the study, thereby reducing error variance associated with lack of comprehension. However, in several important respects a graduate/professional student sample is likely to be more similar to the general population than an undergraduate sample. Specifically, graduate students face many of the same stressors, including navigating marital responsibilities and poor finances (Hyun, Quinn, Madon, & Lustig, 2006), as adults in general. In addition, graduate/professional students are also faced with unique stressors, such as frequent exposure to evaluative situations that can determine successful degree completion and

career trajectories. Thus, we believe that the present sample was an appropriate one in which to study the negative consequences of perceived goal failure and rumination.

In this investigation, the yoked-control condition proved to be motivationally active in ways we had not anticipated. In retrospect, however, this should not have been surprising given that participants were asked to write about personal past failures. In addition, it is also possible that generating situations in response to trait attributes that were not personally relevant was in itself a frustrating task that would have caused decreases in positive mood and increases in negative mood. However, we would have needed a different kind of control condition in order to test this alternative hypothesis about the yoked-control condition.

Another limitation of the current study resulted from the fact that mood and maladaptive rumination were not assessed continuously over the course of the experiment. It is probable that peak changes in emotions could have occurred much earlier during the writing period and were subsequently not captured by the assessment that was conducted at the end of the 15-minute writing-task. If this were in fact the case, then the study's ability to determine the magnitude and type of effect on experienced emotion would have been attenuated. Similarly, we may have missed the peak window to assess rumination. It is probable that participants began to ruminate after writing about the first of three failure scenarios. In a recent investigation of rumination on anger, the results indicated peak differences in ruminative thoughts were detected at 30

seconds and 90 seconds post-induction. No significant differences in ruminative thoughts were identified at 4, 8, and 11 minutes (Gerin, Davidson, Christenfeld, Goyal, & Schwartz, 2006). Future investigations of ruminative thought should employ both continuous measurement of mood and rumination across the entire study, using both biological and behavioral measures of mood (Siegle, Steinhauer, Carter, Ramel, & Thase, 2003).

Conclusions

Overall, results from cross-sectional data indicated that individual differences in perceived promotion and prevention failure were associated with increased endorsement of engaging in trait rumination. In addition, trait rumination was associated with increased symptoms of depression and anxiety. In the experimental phase of the study, the results clearly indicated that exposure to past failures to meet promotion goals increased feelings of dejection for individuals who reported chronic moderate to high levels of promotion failure. In turn, greater magnitude of dejection experienced post-exposure and being pessimistic uniquely predicted engaging in maladaptive rumination even after controlling for elation, agitation, quiescence, and trait rumination. Subsequently, engaging in maladaptive rumination interacted with the presence of high levels of dejection post-exposure to predict intensifications in dejection. Overall, the results suggest that self-regulatory cognition (and in particular, self-perceived promotion failure), the level of affect that results, and variability in the

tendency to engage in maladaptive rumination all play a significant role in determining a person's cognitive and emotional experiences in the ongoing process of self-regulation (Fejfar & Hoyle, 2000; Kross, Ayduk, & Mischel, 2005; Mor & Winquist, 2002).

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BIOGRAPHY

Neil Patrick Jones was born on December 11th, 1977 on the island of Barbados in the West Indies. He prepared in the College of Arts & Sciences and received an A.B. from Cornell University in 1999. He began his graduate studies in the Clinical Psychology Ph.D. Program in the Department of Psychology: Social and Health Sciences at Duke University in the fall of 2001 and received his M.A. in 2005.

During his graduate studies, he has received the following honors and awards: Honorable Mention from the National Science Foundation Graduate Research Fellowship Award (2003), Honorable Mention from the Ford Foundation Predoctoral Fellowship Program for Minorities (2003), Vertical Integration Fellowship from the Duke University Graduate School (2004), Summer Research Fellowship from the Duke University Graduate School (2005), and Duke Interdisciplinary Initiative in Social Psychology (DIISP) Research Award (2005). He has published the following paper and book chapter: "Self-regulation, rumination, and vulnerability to depression in adolescent girls" in *Development and Psychopathology* and "Contributions of social psychology to clinical psychology: Three views of a research frontier" in E. Tory Higgins and Arie W. Kruglanski (Eds.), *Social Psychology: Handbook of Basic Principles (2nd Edition)*. He has presented his research at the Society for Research on Child Development Biennial Meeting, the Society for Research on Adolescence Biennial Meeting, the Annual

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Neil Patrick Jones will complete his Predoctoral Clinical Internship at Western Psychiatric Institute and Clinic at the University of Pittsburgh Medical Center in August 2007, where he will continue on as a Postdoctoral fellow in September 2007.