

WHAT I DON'T KNOW CAN'T HURT ME?:
COGNITIVE AVOIDANCE IN ADULT AT-RISK FOR DEPRESSION

BY

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Contents

TITLE PAGES	i
CONTENTS	iv
LIST OF TABLES AND FIGURES	v
ABSTRACT	vi
INTRODUCTION	1
Defining Avoidance	2
Rumination and Avoidance	3
Avoidant Coping	9
Thought Suppression	11
Overgeneral Memory	15
Direct Evidence for Avoidance in Depression	19
Exposure Therapies for Depression	20
Remaining Questions	23
The Current Research	27
METHOD	
Participants	29
Stimuli	31
Measures	31
Procedure	37
RESULTS	
Data Cleaning	42
Preliminary Analyses	43
Tests of Predicted Hypotheses	47
Exploratory Analyses	48
DISCUSSION	
Summary of Current Results	56
Relationship to Existing Research and Theory	57
Limitations	60
Future Directions	61
REFERENCES	63
APPENDICES	
Appendix A: Depressive Symptom Checklist	77
Appendix B: Recognition Form	78
Appendix C: Visual Analog Scale	80

Tables

Descriptive characteristics of participants.	43
Means and standard deviations of negative image outcome variables.	48
Means and standard deviations of positive image outcome variables.	50
Pearson correlations among positive and negative image viewing time and memory measures for never depressed participants.	51
Pearson correlations among positive and negative image viewing times and memory measures for recovered depressed participants.	52
Pearson correlations among negative image viewing times and questionnaire measures for never depressed participants.	54
Pearson correlations among negative image viewing times and questionnaire measures for recovered depressed participants.	55

Figures

Possible relationships among processes related to avoidance in depression.	24
Experimental session procedure.	37
Pre and post mood induction ratings of never depressed and recovered depressed groups on visual analog scales.	46

Abstract

The current study examined cognitive avoidance in people at-risk for depression. Avoidance was assessed via a performance based measure and self-report questionnaires. Forty-five recovered depressed (RD) and 53 never depressed (ND) participants viewed positive, negative and neutral emotional images. Approximately half of the participants in each group underwent a negative mood induction in order to simulate life stress. Contrary to expectations, RD and ND groups did not differ in length of time that they self selected to view negative or positive images and they did not differ on subsequent recall or recognition memory tasks for negative information in either mood condition. However, ND participants recalled more positive images as “most memorable” than RD participants. There were no group differences on questionnaire measures of avoidance. Findings are inconsistent with prior research showing increased attention to negative information among those at risk for depression as well as prior research showing evidence for avoidance of negative information in depression. Possible explanations for the discrepancies are discussed.

Depression is a debilitating and all-too-common disorder. Recent estimates suggest that more than 1 in 5 people will experience at least one major depressive episode in their lives and the prevalence appears to be increasing for younger generations (Kessler, Demier, Frank, Olfson, Pincus, Walters et al., 2005). Therefore, it is not surprising that there has been extensive research into possible causes and risk factors associated with depression. Empirical evidence has been found for genetic predispositions (e.g., Kendler, Kessler, & Neale, 1993; Kendler, Neale, Kessler, & Heath, 1992), biological abnormalities (see Kennedy, Javanmard, & Vaccorino, 1997) and social skills deficits (Segrin & Abramson, 1994) associated with depression risk.

Researchers have also proposed cognitive theories of depression. In one prominent cognitive theory, Beck (1967; 1976) proposed that under conditions of stress, people who are prone to depression are more likely to view themselves and their environments negatively than are other people. There has been a large amount of empirical support for the theory that increased attention to negative information is a risk factor in depression and the findings regarding attention have been integrated into subsequent cognitive models of depression (e.g. Alloy, Abramson, Walshaw, & Neeren, 2006; Ingram, Miranda, & Segal, 1998). Researchers have found that people who are depressed are more likely to selectively attend to negative information than are nondepressed people and that people who are not currently depressed but are known to be vulnerable to depression selectively attend to negative information more than those who are less vulnerable (e.g. Ingram, et al., 1998). Because the differences

in attention are evident outside of depressive episodes, heightened attention to negative information is theorized to be a causal factor in the onset of depression.

Other research, however, suggests that current cognitive theories may not be capturing all of the attention processes associated with depression. In several research literatures, avoidance of negative information also appears to be associated with depression. These findings regarding avoidance contrast sharply with the theories of increased attention to negative information in depression. Thus, what exactly is meant by avoidance and what do research findings indicate as to how depressed individuals and people at-risk for depression utilize avoidance?

Defining Avoidance.

Avoidance can broadly be defined as a direction of mental resources away from unwanted information, experience, etc. However, within the research literature, there is variation in terminology used to describe avoidance (e.g., cognitive avoidance, emotional avoidance, experiential avoidance, distraction, blunting, thought suppression, retrieval inhibition, avoidant coping, etc.) and many of the terms seem to represent related concepts (Rassin, Merckelbach, & Muris, 2000). In addition, the distinction between cognitive avoidance and emotional avoidance is unclear. For example, Williams and Moulds (2007a) state that, “cognitive avoidance can take a range of forms, including intentional attempts at thought/memory suppression” and “efforts to dissociate or detach oneself from the affective qualities of... ..experience” (p. 1141). Elsewhere, experiential avoidance has been defined as “the phenomenon that occurs when a person is unwilling to remain in contact with

particular private experiences (e.g., bodily sensations, emotions, thoughts, memories, images, behavioural predispositions) and takes steps to alter the form or frequency of these experiences or the contexts which occasion them” (Hayes, Strosahl, Wilson, Bissett, Pistorello, Toarmino et al., p. 553). These are broad and overlapping definitions that incorporate aspects of thinking and emotion. Indeed, in much of the literature, researchers use terms that encompass aspects of cognition and emotion. Thus, it seems that a theoretical assumption of most researchers investigating forms of avoidance is that cognitive avoidance is closely related to attempts to avoid unpleasant or unwanted emotions. For example, self-report items used to measure avoidance are often phrased in such a way to suggest that avoidance is something that would be done in response to unwanted emotional material. Some examples include asking what one does to “*Feel better*” or how one “*cope with stress.*” Thus, for the purposes of this project, the term avoidance will be used to refer to cognitive and emotional avoidance. Evidence for such avoidance in the context of depression is accumulating in a number of research literatures

Rumination and Avoidance.

Rumination has been widely recognized as a common symptom of depression, and moreover, people with a tendency to ruminate are at an elevated risk for depression compared to those without such tendencies (e.g. Nolen-Hoeksema, 1991). Thus, rumination is an important phenomenon that may be related to causal mechanisms in depression. The term “rumination” refers to a perseverative focus on feelings and problems (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). As such,

ruminative processes are typically conceptualized as involving increased attention to negative information. However, researchers have recently theorized that this conceptualization may be incomplete or incorrect. It is has been suggested that although avoidance and rumination reflect very different processes, they are also highly related through a common factor of poor attentional control. Thus, people who are depressed or at-risk for depression are prone to extremes in attention either through over-directing their attention to negative information, as in rumination, or under-directing it as in avoidance (Hayes, Beevers, Feldman, Laurenceau, & Perlman, 2005; Williams, Barnhofer, Crane, Hermans, Raes, Watkins & Moulds, 2007). For example, the negative emotional experience that is often brought on by ruminative thinking may be so painful that it leads to attempts to avoid the uncomfortable thoughts that promote such feelings. This theory is consistent with findings that depressed people harbor “positive” beliefs about rumination (e.g. believing it helps them develop a coping response) but at the same time also hold negative beliefs (e.g., it is uncontrollable and painful) (Papageorgiou & Wells, 2001). This ambivalence about the utility of rumination could plausibly lead to vacillations between over-engaging and attempting to disengage from negative material. It is theorized that the alternating between over- and under-engagement interferes with effective processing of emotions and experiences, which requires integration of cognitive and emotional components of experience (Greenberg, 2002; Greenberg & Watson, 2005; Hayes, Feldman, Beevers, Laurenceau, Cardaciotto, & Lewis-Smith, 2007).

An alternate theory regarding the relationship between rumination and avoidance is that rather than involving heightened attention to negative information, rumination is actually a form of avoidance of negative material (Cribb, Moulds, & Carter, 2006; Moulds, Kandris, Starr, & Wong, 2007). This is a greater departure from prior thinking about rumination because a large amount of research also suggests that rumination intensifies negative affect (e.g., Nolen-Hoeksema & Morrow, 1993). Those investigators proposing the rumination-as-avoidance hypothesis do not suggest that rumination functions as effective avoidance of all negative material, but rather to distract from material that is even more emotionally painful. Thus, rumination may be distracting from certain negative content but at the same time continuing to yield increased levels of negative emotion due to focus on other negative material.

The current status of the literature does suggest a link between rumination and avoidance, although much of the research does not allow discernment between the validity of the poor attentional control theory versus the rumination-as-avoidance theory. In one study, participants were asked to recall negative intrusive (but not traumatic) memories after which researchers inquired about whether the intrusive memories were recalled from a field perspective (from own viewpoint) or an observer perspective (like watching a movie) (Williams & Moulds, 2007b). The tendency to recall memories from an observer perspective was used as a proxy for attempts to distance oneself from the memory. Among people high in dysphoria who also reported recalling their intrusive memories from an observer perspective, there were

significantly higher reports of ruminative tendencies when compared to low dysphoric and high-dysphoric/field perspective groups. Thus, for those high in depressive symptoms, apparent attempts at distancing the self from negative memories were significantly associated with rumination.

In a study examining coping strategies associated with rumination, two strategies that the investigator termed “disapproval and efforts to dismiss the thought” and “negative control” remained significantly correlated with rumination even after controlling for depression and anxiety (Watkins, 2004). The items endorsed for these strategies included things like “*I tell myself the thought means nothing*”, “*I replace the thought with another unpleasant thought*” and “*I reprimand myself.*” In a study by Rude, Maestes, and Neff (2007), it was found that a frequently used measure of rumination was significantly related to depression and “mental disengagement.” Thus, the unpleasant feelings prompted by a negative evaluative focus in rumination may lead people who are depressed or prone to depression to avoid thinking about the events altogether. Rude et al. (2007) note “Rumination is often conceptualized as consisting of an excessive focus on unhappiness. In this view, it might be considered the opposite of avoidance... Yet, with remarkable consistency, the core rumination items (the Brooding Scale) revealed strong correlations with indices of suppression, avoidance and disengagement” (p. 860).

In another study participants watched an emotional film clip and were then asked to write a description of the clip (Cribb et al., 2006). Raters coded the film descriptions for degree of concreteness, which they used as a gauge of attention and

processing of the clips. Participants also completed the Ruminative Response Scale of the RSQ as a measure of tendency to ruminate. Researchers found that tendency to ruminate was significantly associated with reduced concreteness in film descriptions. Overall, these studies suggest that rumination and avoidance do tend to occur in the same people. However, they are unable to address whether the co-occurrence is due to avoidant qualities of rumination or a tendency to fluctuate between over- and under-engagement with negative information.

In support of the theory that rumination is itself a form of avoidance, researchers have borrowed from the literature examining thinking processes in anxiety disorders. For example, in Post Traumatic Stress Disorder (PTSD), an intrusive focus on traumatic events centers on causes and consequences of the traumas rather than the events themselves. It is suggested that this is an attempt to avoid direct reliving and emotional experiencing of the events (Ehlers & Clark, 2000). In addition, vague and diffuse worrying is a predominant symptom of generalized anxiety disorder (GAD). Researchers have suggested that the worry functions as a distraction from experiencing emotions related to thoughts of unpleasant or unwanted material (Borcovec, Ray, & Stober, 1998). As has been suggested of PTSD and GAD, in depression, rumination may be a way to avoid the emotional experience associated with thinking about negative emotional information. Cribb et al. (2006) have noted “Rumination may be conceptualized as a cognitive style that promotes avoidance by impeding the activation of emotional and somatic responses” (p. 167).

Consistent with the idea that rumination in depression functions similarly to worry in anxiety, moderate correlations between rumination and worry have been found in unselected samples (Watkins, 2004). However, as researchers have noted (Borcovec et al., 1998), worry is future themed (e.g., thinking about how things might go wrong in the future) whereas rumination is focused on past concerns (e.g., thinking about how something could have gone better). The most direct support for the rumination-as-avoidance theory comes from a study in which depressed, formerly depressed and never depressed participants were asked a series of questions designed to induce rumination (Watkins & Moulds, 2007). After several minutes, participants were asked to provide descriptions of the problems about which they were currently ruminating. It was found that people who were currently depressed produced less concrete descriptions of their ruminative problems than did the other groups. Thus, depressive rumination resulted in the least concrete and presumably most avoidant descriptions. Researchers assert that the descriptions were captured during apparently active rumination, which would suggest that rumination itself results in decreased specificity. However, it may also be that participants had already switched from a ruminative focus to an avoidant strategy when researchers collected descriptions. Thus, the debate regarding how rumination and avoidance are actually related remains to be resolved.

It should be noted that one study has not supported an association between rumination and avoidance. In that study, Moulds et al., (2007) reported that rumination as measured by the RSQ correlated with cognitive and behavioral

avoidance. However, the correlation between cognitive avoidance and rumination did not remain significant after controlling for anxiety. In fact, some researchers (e.g., Ottenbriet & Dobson, 1995) have pointed out that any avoidance measured in the context of depression may simply be reflecting comorbid anxiety, rather than depression. The finding of Moulds et al (2007) is somewhat supportive of such a hypothesis. However, Moulds et al (2007) noted that if rumination reflects a process whereby there is increased cognitive attention to negative material in order to distract from the emotional experience of the material, the complexity of the process may be difficult to accurately measure.

Avoidant Coping.

If, as has been speculated with regard to rumination, avoidance is used in an attempt not to experience unpleasant thoughts or feelings brought on by rumination, then avoidance is being used as a coping strategy. Indeed, coping strategies have frequently been categorized as “approach” versus “avoidant” (Moos, 1997). In addition, some research suggests that people who are depressed or prone to depression are more likely to adopt avoidant coping patterns.

For example, retrospective measures of emotional invalidation as children have been found to predict adult avoidant coping, which in turn predicts level of anxious and depressive symptoms as adults (Krause, Mendelson, & Lynch, 2003). In addition, avoidant coping in children is significantly correlated with depressive symptoms (Spacarelli & Fuchs, 1997). Although these studies did not examine whether the associations between avoidant coping and depression remained after

controlling for anxiety, other studies have documented the relationship after controlling for anxiety.

For instance, Spurrell & McFarlane (1995) found that among people presenting to an outpatient clinic who endorsed high levels of stressful life events, cognitive avoidance was significantly related to levels of depression and remained so after controlling for anxiety. The researchers indicated that participant's cognitive reactions to their stressful life events appeared to act as intervening variables in their outcomes. In a prospective study, participants were measured on level of depressive symptoms and classified as high or low in cognitive avoidant coping (Blalock & Joinier, 2000). After three weeks, individuals were reassessed for depressive symptoms and measured on stressful life events during the interim. Among females who scored high in stressful life events and cognitive avoidance, depressive symptoms significantly increased during the study. This relationship was not found in males. Thus, this study provides some support for a negative effect of avoidant coping on depressive symptoms.

One published study found that avoidant coping was not related to depression (Yoshizumi, Murase, Murakami, & Takai, 2007). Researchers measured avoidant coping, depressive symptoms and retrospective reports of parental rearing practices, which have been shown to be related to risk for depression (e.g., Heider Matshinger, Bernert, Alonso, & Angermeyer, 2006). In that study, avoidant coping did not mediate the relationship between rearing practices and depression levels.

Thought Suppression.

Thought suppression seems to fall easily under the realm of avoidance. In addition, investigations into thought suppression suggest that it is a conscious process people engage when they become uncomfortable with the focus of their thoughts, which makes it closely related to, or perhaps synonymous with avoidant coping (Wegner, Schneider, Carter, & White, 1987). It has repeatedly been documented that thought suppression results in a paradoxical effect whereby the more a person tries not to think about a topic, the more frequently the topic enters awareness (e.g. Wegner, 1994). This has been termed the “rebound” effect. Wenzlaff, Rude, & West (2002) suggest that the rebound effect emerges when individuals become so cognitively overwhelmed, that they are unable to effectively suppress material. Feeling overwhelmed is a particularly likely scenario among depressed people. In addition, a higher level of thought suppression is associated with greater distress about the to-be-suppressed thoughts when they do enter awareness (Marcks & Woods, 2005).

It is widely documented that currently depressed individuals and those at-risk for depression report higher levels of thought suppression than do never depressed or low-risk groups (Beevers, Wenzlaff, Hayes, & Scott, 1999; Marcks & Woods, 2005; Rude, Wenzlaff, Gibbs, Vane, & Whiteney, 2002; Rude & McCarthy, 2005; Wenzlaff & Bates, 1998; Wenzlaff & Eisenberg, 2001; Wenzlaff et al., 2001; Wenzlaff et al., 2002). More specifically, it has also been shown that attempts to suppress thoughts about personally relevant depressing topics lead to increases in thoughts about the

depressing topics (Roemer & Borcovec, 1994) and that the rebound effect is more distressing to those high in depressive symptoms than those low in symptoms (Williams & Moulds, 2007b). In a sample of undergraduates who were given mock negative feedback about themselves, those with less complex self-concepts were more prone to the rebound effect after attempting to suppress the negative feedback (Renaud & McConnell, 2002). This is interesting with regard to depression because people at-risk for depression tend to have less complex self-concepts when compared to low risk groups (e.g., Linville, 1987). Thus, people already at-risk for depression by way of their self-concepts may also be at greatest risk of experiencing a rebound in unwanted thoughts and emotional distress associated with those thoughts. It seems that avoidant strategies may be particularly ineffective for people already at increased risk for depression.

In a longitudinal study, researchers examined the relationship between thought suppression and depressive symptoms among adults undergoing treatment for depression (Rosenthal, Cheavens, Compton, Thorp, & Lynch, 2005). After controlling for pretreatment depression level and age of initial episode onset, greater suppression tendencies predicted higher depressive symptoms at 6 months post treatment. Interestingly, thought suppression was not predictive of depressive symptoms immediately post treatment. Thus, the negative effects of thought suppression may develop over an extended period of time. In fact, thought suppression may even be helpful and somewhat effective to people in the short term. This hypothesis would parallel findings in anxiety in which avoidance of distressing

thoughts and feelings is effective in reducing anxiety in the short term. However, the persistent avoidance of anxiety-provoking material serves to maintain the anxiety in the long term (Borcovec et al., 1998).

The possible applications of the thought suppression literature to emotion regulation within depression are abundant. In particular, the rebound effect documented in the thought suppression literature offers a possible linkage between two seemingly paradoxical processes in depression: the increased attention to negative information on one hand and cognitive avoidance on the other. In several studies, time course fluctuations in attention have been examined. For example, currently, previously and never dysphoric groups were asked to listen to a series of homophones that could be interpreted in negative or neutral ways (e.g., weak/week) (Wenzlaff & Eisenberg, 2001). Immediately following homophone presentation, currently and formerly dysphoric groups showed a negative bias in interpretation compared to the never dysphoric group. However, after a 10 second delay, the bias of the formerly dysphoric group diminished. The degree of diminishing bias correlated with level of thought suppression, suggesting that the formerly depressed group was able to effectively use suppression techniques when given a 10 second period but unable to mobilize suppression immediately. In a similar study, depressed, formerly depressed and never depressed groups were asked to unscramble a series of sentences that could be unscrambled in either a negative or a neutral/positive way (Wenzlaff et al., 2002). The depressed group had a negative bias in their unscrambling compared to never and formerly depressed groups. However, when a cognitive load was

introduced (remembering a six digit number), formerly depressed participants also evidenced a negative bias and looked similar to the depressed group. Wenzlaff et al. (2002) suggest that in the no load condition, any suppression attempts made by depressed individuals were ineffective because depressed participants were cognitively overwhelmed by their depression symptoms. In contrast, formerly and never depressed participants were able to effectively ward off any unwanted negative thoughts. However, once a cognitive load was introduced, formerly depressed participants also became overwhelmed and ineffective at suppressing negative information.

An additional study measured attention using pupil dilation, an indicator of attention allocation (Steidtmann, Ingram, & Siegle, 2010). When compared to never depressed participants, formerly depressed participants showed increased dilation to negative emotional words before a sad mood induction but decreased dilation to negative words after the mood induction. It is possible the mood induction served as a cognitive challenge in the same way the cognitive load did in the Wenzlaff et al., 2002 study. However, whereas the cognitive load apparently made suppression of negative material more difficult for the formerly depressed group in Wenzlaff et al., suppression became more apparent in the Steidtmann et al study. A possible explanation for the discrepancy is the differences in time points at which outcomes were measured. In Wenzlaff et al (2002), attention outcomes were measured simultaneously with the cognitive challenge whereas in Steidtmann et al., the mood induction was administered as a precursor to the attention task. Perhaps in the latter

study, measures of attention were captured during a “recovery” phase whereby participants were attempting to regroup from the cognitive challenge and mobilize suppression/avoidance tactics.

A similar pattern of effective suppression/avoidance and cognitive overload was observed in a longitudinal study (Wenzlaff & Luxton, 2003). College students who scored low in rumination and depressive symptoms at baseline and either high or low in suppression were followed for 10 weeks. After 10 weeks, those people high in thought suppression, and who also endorsed high stress in the interim, showed significant increases in depressive symptoms and rumination. The low suppressor group and the high suppressor group that did not report high stress did not show such increases. Thus, among the high suppressor group, attempts to suppress or avoid negative thoughts may have become overwhelmed by life stressors and led to a rebound of such thoughts in the form of rumination, which in turn led to increases in depressive symptoms. The findings from this and the Steidtmann et al. study suggest that people at-risk for depression vacillate between inability to effectively suppress or avoid distressing information and apparently effective use of disengagement. This interpretation would be consistent with the conceptualization of rumination and avoidance as distinct but reciprocal processes.

Overgeneral Memory.

An apparent byproduct of avoidant coping and thought suppression is overgeneral memory. Overgeneral memory refers to the widely established finding that depressed people and people at-risk for depression tend to recall less specific

autobiographical memories in response to emotional cues (e.g., “describe your saddest lifetime memory”) when compared to low-risk groups. A recent meta-analysis suggests a large effect size for overgeneral memory in response to both positive and negative cues (Williams et al., 2007). Raes, Hermans, Phillipot, and Kremers (2006) have noted that overgeneral memory represents a likely trait or vulnerability marker for depression and depression relapse. Indeed, in several studies it has been found that overgenerality predicts depression course. Among depressed people, overgeneral memory scores at baseline significantly correlated with failure to recover from depression 7 months later (Brittlebank, Scott, Williams, & Ferrier, 1993). In that study, overgeneral memory accounted for 33% of the variance in depression status at 7 months. In another study, participants giving less emotionally descriptive responses to queries about their happiest and saddest lifetime memories were more depressed 1 year later (Rottenberg, Joorman, Brozovich, & Gotlib, 2005). Thus, overgeneral memory does appear to be related to important cognitive and/or emotional processes in depression.

Researchers have only recently begun examining the processes that may underlie the overgeneral memory effects, but many of the proposed explanations for overgeneral memory have included avoidant processes. Williams et al. (2007) state, “In the short term it [may be] less dangerous to think about more vague memories in order to avoid activating affect associated with specific memories. This avoidance leads to a less specific memory style in general. The result is cognitive avoidance... We suggest that... an avoidant coping style takes some time to develop. For some

persons it might remain a flexible and helpful strategy in warding off negative emotions, whereas for others it might develop into an inflexible and habitual response pattern” (p.134). Similarly, Kuyken, Howell, and Dalgleish, (2006) suggest, “[A] possibility is that overgeneral memory is... a function of some form of affect regulation... For instance, overgeneral memory style may develop within social milieux (e.g., families, peer groups) characterized by emotional avoidance, in which such an emotionally avoidant cognitive style then confers a risk for later depression” (p. 389). Because experimental manipulations have been shown to increase memory specificity (e.g. Watkins, Teasdale, & Williams, 2000), researchers have pointed out that overgeneral memory appears to be driven by avoidance during the time of memory retrieval, rather than encoding (Williams et al., 2007). That is, if avoidance took place at the time of encoding, the information would not be stored and thus not be available to emerge during experimental manipulations. Accordingly, overgeneral memory has also been theorized to result from frequent attempts at thought suppression (Rassin et al., 2000).

Some researchers have discounted the avoidance explanation for overgeneral memory (e.g., Brittlebank, Scott, Williams, & Ferrier, 1993) by pointing out that the lack of specificity is also manifested for positive memories, which people would be unlikely to attempt to avoid. However, proponents of avoidance explanations assert that if people are highly motivated to avoid painful emotions associated with past memories, they may learn to be nonspecific about all memories. For example, thinking vividly about a time one felt very happy could lead to thoughts about how

one no longer feels that way, feels that way so infrequently, etc. (Williams et al., 2007).

As with other accounts of avoidance in depression, researchers have drawn parallels between anxiety and overgeneral memory and depression and overgeneral memory. For instance, individuals diagnosed with generalized anxiety disorder (GAD) described their worries with significantly more detail following treatment in which they no longer met criteria for GAD (Stober & Borcovec, 1998). Other studies have more directly examined the relationships between overgeneral memory and avoidance. For instance, in an unselected sample of students, overgeneral memory for emotional life events significantly correlated with avoidance on several questionnaires (Hermans, Defranc, Raes, Williams, & Eelen, 2005). Higher thought suppression scores have also been related to poorer memory in response to specific questions about recently viewed emotional film clips (Richards & Gross, 2006). In that study, those people scoring highest on thought suppression evidenced memory deficits as large as a subset of participants asked to intentionally distract themselves from watching the clips.

Several studies have also linked overgeneral memory to depressive rumination and poor problem solving. For example, it was found that greater tendency to ruminate is associated with poorer problem solving and that overgeneral memory mediates the relationship between problem solving and rumination (Raes, Hermans, Williams, Demyttenaere, Sabbe, Pieters et al., 2005). In another study, participants were identified as high or low in trait rumination (Raes, Hermans, Williams, Geypen,

& Eelen, 2006). Subsequently, an overgeneral style of remembering was experimentally induced for half the participants by asking participants to think of a “type of event” whereas control participants were asked to recall “a specific event.” Among those high in trait rumination, inducing overgeneral memory led to increases in reported rumination. No increases were observed among those low in trait rumination. In related studies, experimentally inducing rumination among depressed people leads to increases in overgeneral memory (Park, Goodyer, & Teasdale, 2004; Watkins & Teasdale, 2004). Thus, rumination and overgeneral memory seem to be closely related and mutually reinforcing.

Direct Evidence for Avoidance in Depression.

Although the research thus far reviewed provides indirect evidence of avoidance in depression, only a small number of published studies have more directly examined avoidance and depression. During development of the cognitive-behavioral avoidance scale (CBAS), researchers found that the relationships between avoidance and depressive symptoms were as strong as those between avoidance and anxiety symptoms (Ottenbreit & Dobson, 2004). This finding was surprising given that avoidance is recognized as a core feature of anxiety but not depression. Another study also found significant correlations between avoidance on the CBAS and depressive symptoms, although anxiety was not controlled for in the study (Moulds, et al., 2007). However, two additional studies have found that avoidance remained associated with depression scores after controlling for anxiety. Ottenbreit and Dobson (2004) found that avoidance on the CBAS predicted small but unique variance in depression after

controlling for anxiety. Another study measured nonclinical undergraduates on correlations between depressive symptoms and two questionnaire measures of avoidance. Avoidance scores were significantly positively correlated with level of depressive symptoms and remained so after controlling for anxiety scores (Cribb, et al., 2006).

Notably, in one study depression scores were longitudinally predicted by a measure of avoidance (Brewin, Reynolds, & Tata, 1999). Among people who were currently depressed at baseline, avoidance scores significantly predicted depression symptoms 6 months later. In another study, a performance-based measure of attention that was suggestive of cognitive avoidance was found to be increased among those at-risk for depression (Ingram, Bailey, & Siegle, 2004). Participants engaged in an emotional stroop task in which they were asked to name the color of depressive words. The at-risk group was significantly faster at naming word color, and thus, able to direct attention away from depressive word meaning faster than a low risk group.

Exposure Therapies for Depression.

Exposure based therapies have proven effective for anxiety disorders (see Norton & Price, 2007 for a meta-analysis). Given the preliminary evidence for avoidance in depression, researchers have begun designing and pilot-testing treatments for depression that include exposure components. In fact, some researchers assert that cognitive therapy for depression does not change the content of negative thoughts inasmuch as it changes the way in which people interpret and evaluate those negative thoughts and thus changes ability to tolerate and expose

oneself to the thoughts (Teasdale, 1997; Teasdale, Pope, Moore, Hayhurst, Williams, & Segal, 2002; Teasdale, Segal, & Williams, 1995). Acceptance and Commitment Therapy (ACT) is one such intervention that is aimed at decreasing emotional avoidance by increasing ability to tolerate and re-evaluate negative thoughts. ACT has been effective in treatment of a variety of disorders (Hayes, Luoma, Bond, Masuda, & Lillis, 2006) including depression (Forman, Herbert, Moitra, Yeomans, & Geller, 2007; Zeller & Rains, 1989). Although ACT also includes behavioral interventions, it includes a cognitive component in which people are taught to “defuse” upsetting thoughts and feelings by accepting the experiences in a non-judgmental way (Forman et al., 2007). Similarly, in Mindfulness-Based Cognitive Therapy (MBCT) people are asked to practice “de-centering” or acknowledging their thoughts while also interpreting the meaning of the thoughts in different ways. In essence, people are asked to recognize that “a thought is just a thought” and to avoid assigning a large amount of meaning to negative thoughts (Teasdale et al., 2002). This may be likened to asking people to expose themselves to negative thought content in order to help them learn how to more effectively manage the negative content when it does occur. Although decentering may be extremely difficult or impossible for people to master while people are depressed, it has been hypothesized that it would be especially useful among at-risk groups during times of stress that might otherwise spiral into a depressive episode. Indeed, MBCT has shown promise as a relapse prevention strategy. An intervention designed to increase people’s abilities to assign different meanings to their thoughts decreased depressive relapse

when compared to treatment-as-usual (Teasdale et al., 2002). Those people who were most able to tolerate and subsequently evaluate their thoughts in new ways were the least likely to relapse.

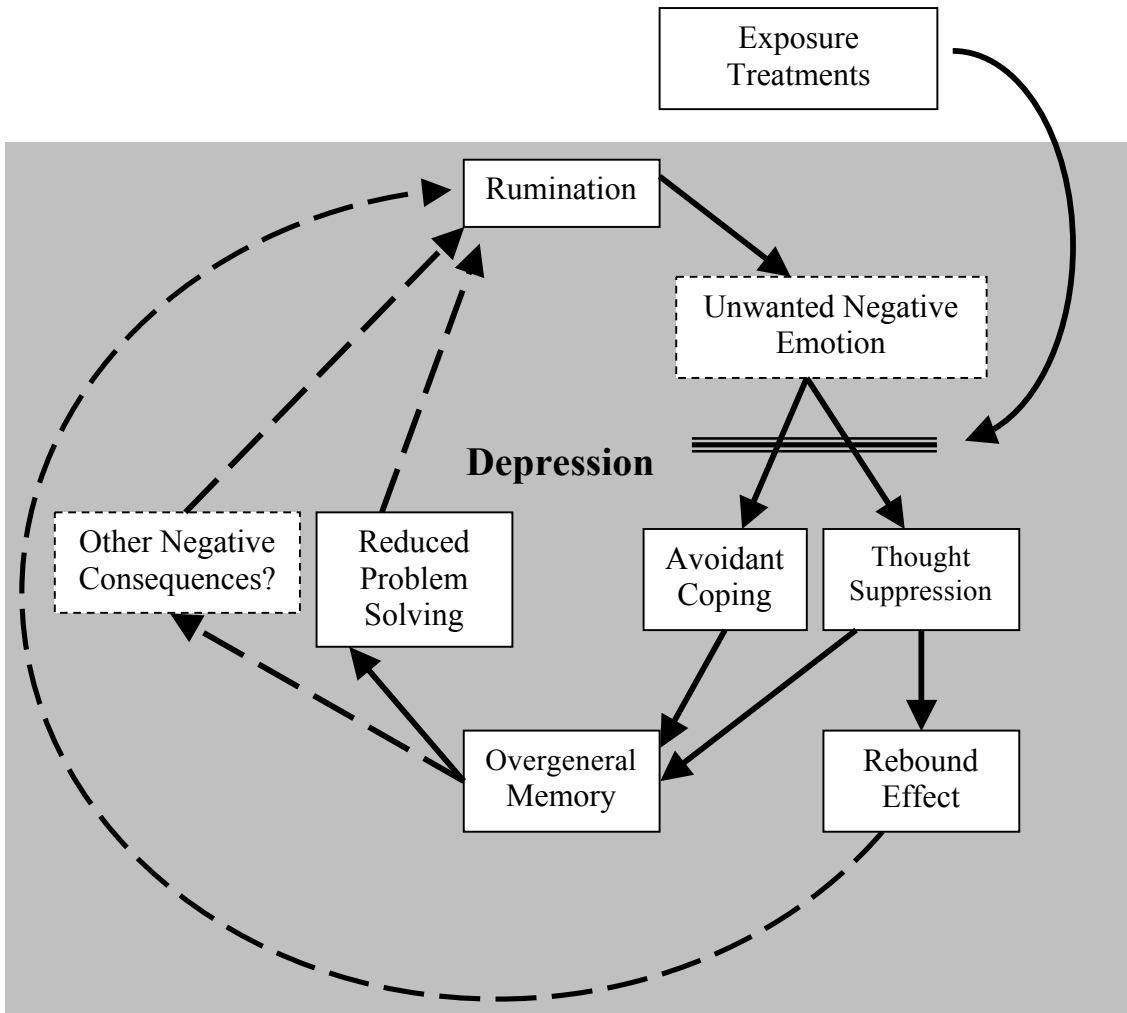
In another application of exposure principles to depression treatment, Hayes et al. (2005) conducted a pilot study examining the effect of Exposure Based Cognitive Therapy (EBCT) for participants diagnosed with depression. The identified aim of EBCT is “guided exploration,” in which therapists assist participants with gradual cognitive and emotional processing of depressive information without making attempts at stopping or decreasing negative affect associated with the material. Before participants were asked to engage in guided exploration, they were taught mindfulness skills to help them recognize and acknowledge negative thoughts without making negative judgments about the thoughts. Participants were also taught distress tolerance skills to increase their ability to endure emotions experienced during the guided exploration. Participants wrote weekly narratives describing their depression. The narratives were coded by raters for level of peak processing (the degree to which participants described emotions and thoughts in writing without avoidance or rumination). The degree of peak processing for participants was significantly related to reductions in depressive symptoms. At the conclusion of the study, 24 of 29 participants no longer met criteria for major depression and had experienced at least a 50% reduction in symptoms (Hayes, Beevers, Laurenceau & Perlman, 2005). It is difficult to assess whether the symptom reduction was primarily due to mindfulness skills, distress tolerance skills, exposure, or some combination of the three. However,

time course analyses revealed that exposure initially worsened depressive symptoms for many participants, but that higher levels of guided exploration during symptom spikes were related to greater subsequent symptom reduction (Hayes, Feldman, Beevers, Laurenceau, Cardaciotto & Lewis-Smith, 2007). Thus, exposure does seem to be one active component of the treatment. It should be noted that EBCT is still in preliminary stages and further research into the mechanisms through which exposure may decrease depressive symptoms will be particularly important. However, research showing efficacy of a number of depression treatments aimed at decreasing avoidance is encouraging and suggests that further examination of avoidant processes associated with depression is a useful venture.

Remaining Questions.

The reviewed literatures provide empirical support that avoidance plays an important role in maintaining depression, and possibly, in risk for depression. A proposed model of relationships among various processes related to avoidance in depression appears in Figure 1.

Figure 1. Possible relationships among processes related to avoidance in depression. Solid boxes and lines indicate empirically documented constructs and relationships, although directionality has been theorized in some cases. Dashed boxes and lines indicate areas in need of empirical study.



Taking into account the bulk of the current findings, it seems that the tendency to ruminate, a known risk factor for depression, leads to unwanted or unpleasant negative emotion that eventually leads to attempts at avoidant coping and thought suppression. The rebound effect documented in thought suppression may lead directly back to increased rumination. In addition, avoidant coping and thought suppression may result in overgeneral memory, which, in turn leads to reduced problem solving ability and increased rumination. Over time, the repetition of the process is likely to strengthen the relationships among rumination and avoidance and result in more habitual, problematic patterns. Furthermore, in addition to having the paradoxical effect of increasing ruminative thinking, frequent avoidance is likely to render individuals particularly ineffective and unpracticed in managing strong negative thoughts and emotions when they do overwhelm attempts at avoidance. Although still in preliminary stages, exposure based treatments for depression aim to target the avoidant coping/thought suppression responses that may be present among those who are depressed and at-risk for depression. Thus, they are a possible approach for stopping the theorized cycle of avoidance and rumination in depression.

The existing research suggests that rumination and avoidance may alternate cyclically within the same individuals and that this accounts for the seemingly contradictory findings of increased versus decreased attention to negative information in depression. However, empirical evidence that could document this process is still needed. If rumination and avoidance are dynamic processes alternating within

individuals, the time points at which attention is measured could greatly impact empirical findings regarding attention.

In part, the fluctuations may depend on whether the person is currently in a depressed episode or depression has remitted. It is highly likely that attempts at avoidance are more effective for people who are not currently experiencing depression. However, even for those not currently experiencing depression, avoidance effectiveness may be disrupted during times of increased stress or cognitive strain. For example, Wenzlaff and colleagues (2001; 2002) found that increased cognitive load immediately diminished the ability for an at-risk group to suppress negative attention biases. However, Steidtmann et al. (2010) found evidence that an at-risk group was able to disengage from negative stimuli several minutes after a cognitive challenge. Thus, remobilization of avoidant strategies may occur rather quickly for those who are not currently experiencing a depressive episode. In addition, further investigation of when avoidance is occurring will be useful. As is suggested by overgeneral memory research, is avoidance primarily occurring during retrieval processes associated with unpleasant information, or does avoidance also occur during initial presentation of uncomfortable material?

Differences in time course of measurement may be one way in which the paradox of heightened attention to negative information versus avoidance of negative information can be resolved. Although most studies to date have used trait measures of avoidance and rumination, research that assesses the variables in relation to time course will be extremely informative. In particular, determining how cognitive

avoidant strategies may change over time and in response to stress would further understanding about cognitive risk for depression, and potentially clear up prior discrepancies in the literature.

Another important avenue for future knowledge will be conducting research using measures of avoidance that do not rely on self-report. Self-report methods have been extensively criticized elsewhere; one of the main criticisms has been the possibility that people are not very accurate in reporting on their own cognitive and emotional processes (see Jobe & Mingay, 1991 for a review). This criticism seems particularly relevant with regard to measuring avoidance. When assessing people who may habitually attempt to push their own emotional and cognitive processes out of awareness, the expectation that those people will always be able to accurately report on doing so seems tenuous. Ideally, using self-report and other performance based measures in combination would allow researchers to most fully capture the nature of avoidant processes as it will allow for external validation in combination with information about internal psychological experience.

The Current Research.

The aim of the current research was to further examine avoidance in a group at-risk for depression. The time course of cognitive avoidant processes, the effects of an external stressor on avoidance and the effects of avoidance on memory were compared between groups at relatively higher and lower risk for depression. In addition to questionnaire measures of avoidance, a novel performance based measure was used to assess avoidance. Fifty-three never depressed (ND) and 45 recovered

depressed (RD) individuals were asked to view positive, negative and neutral emotional images. As the performance-based avoidance measure, participants self-selected the length of time that they viewed the images. Subsequent recall for the images was assessed after a short delay. In order to evaluate the effect of stress on cognitive avoidance, approximately half of the participants in each group (27 of the ND and 22 of the RD participants) underwent a negative mood induction before the image viewing task. Thus, the study consisted of a 3 X 2 X 2 mixed design with a within subjects variable of image valence (positive, negative and neutral) and between subjects variables of negative versus control mood induction and recovered depressed versus never depressed status. Self-report questionnaires were used to measure trait cognitive strategies of participants as well as cognitive processes utilized during the image-viewing task.

Based on prior research indicating attempts at cognitive avoidance of negative information in depression, especially during times of stress, it was expected that RD participants who received a negative mood induction would elect to view negative emotional images for a shorter amount of time than would other participants. No specific predictions regarding the relationship between viewing time and subsequent recall were made. For example, it was plausible that if participants avoided the negative stimuli during presentation, and subsequently during retrieval processes, shorter average viewing time of images would be associated with poorer subsequent memory recall for those images. However, if avoidance took place primarily after stimulus presentation, as suggested by the overgeneral memory literature, it was also

possible that viewing time of images would not correlate with memory recall. Additionally, although the status of the research literature did not lend itself to any specific predictions about the relationships between questionnaire measures of avoidance and the performance-based task, exploratory analyses were conducted in order to examine if self-report measures of trait and task-specific avoidance correlated with viewing time for the negative images.

Method

Participants

Participants were college undergraduates. The majority participated as part of a course requirement (n = 92). Due to difficulty in recruiting eligible participants, a subset of participants were recruited with an alternative method in which they received course extra credit and \$20 for their participation (n = 5). In total, 45 of the participants met criteria for the recovered depressed (RD) group and 53 of the participants met criteria for the never depressed group (ND).

Eligibility for ND and RD groups. During an online prescreening session, potential participants completed an abbreviated (5-item or 7-item) version of the Beck Depression Inventory-II (BDI-II; Beck, Steer & Garbin, 1996; abbreviated versions included items 1, 2, 3, 4, 7 plus 8 and 13 in the 7-item version), an abbreviated 5-item version of the Beck Anxiety Inventory (BAI; Beck, Epstein, Brown & Steer, 1988; Appendix A; abbreviated version included items 4, 5, 7, 8 and 13) and a self-report checklist of symptoms of a major depressive episode (Appendix A). These measures were used to identify likely qualifying participants. Total BDI-II score was estimated

from the abbreviated prescreen version and was used to assess current level of depressive symptoms. On the full measure, scores above 12 are generally considered to represent significant levels of depressive symptoms and indicative of at least mild depression (Beck, Steer & Garbin, 1988). On the symptom checklist participants were specifically requested to report on past time periods lasting two weeks or more and the responses were used to assess for presence of prior depressive episodes. Total scores on the BAI were estimated from the abbreviated BAI prescreen version and used as a gauge of current anxiety level. In order to rule out the possibility that anxiety was driving avoidance effects, only individuals with estimated BAI scores less than 13 were recruited for either group. Therefore, participants with estimated scores of less than 13 on the BDI-II, less than 13 on the BAI and who endorsed at least 1 of the cardinal symptoms and 4 or more total symptoms of depression on the symptom checklist met initial eligibility for the RD group and were recruited via telephone and email for the experimental session. Participants with estimated scores of less than 13 on the BDI-II, less than 13 on the BAI, and who endorsed two or fewer symptoms on the symptom checklist met initial eligibility for the ND group and were also recruited via telephone and email for the experimental session.

At the experimental session, the mood module of the Structured Clinical Interview for DSM-IV (SCID-I/NP; First, Spitzer, Gibbon, & Williams, 2002) was used to verify that participants met eligibility for the ND or RD groups. Only participants who reported that they did not currently meet, and had never met criteria for major depressive disorder or bipolar disorder were classified as ND. Only

participants who reported having one or more depressive episodes more than six months prior to the experimental session and no depressive episodes in the prior six months, and who did not meet criteria for bipolar disorder were classified as RD. Because bereavement is not theorized to represent a distinct process from other major depressive episodes, participants whose depressive episode was due to bereavement were included in the RD sample. Nineteen participants endorsed subsyndromal levels of major depression and were not included in either group.

Stimuli

Cognitive processing stimuli were 45 images (15 positive, 15 neutral and 15 negative) taken from the International Affective Picture System (Lang, Bradley, & Cuthbert, 2005; IAPS). All images selected for this study were pictures of people. Images were selected so that average normed emotional valence was of approximately equal strength in positive and negative images and so that normed arousal and complexity was equivalent across positive and negative images. It was not possible to equate neutrally valenced images with positive and negative images on complexity and arousal. However, neutrally valenced images were selected to be as comparable as possible.

Measures

The Beck Anxiety Inventory (Beck, Epstein, Brown, & Steer, 1988; BAI). The BAI is a 21-item self-report measure of severity of anxiety symptoms. It has been used in both clinical (Beck et al., 1988) and non-clinical populations (Creamer, Foran, & Bell, 1995) and has strong internal consistency and test-retest reliability (Beck et

al., 1988). Scores range from 0-63 with scores over 7 indicating at least mild anxiety. Although BAI scores do correlate moderately with BDI-II scores, scores on the BAI have been shown to differentiate between anxiety disorders and major depression better than other commonly used anxiety measures (Creamer et al., 1995).

The Beck Depression Inventory-II. (Beck et al., 1996; BDI-II). The BDI-II is a widely used 21-item self-report measure of depressive symptoms. It has been used in both clinical and non-clinical student populations and prior versions have been shown to be reliable and valid (Beck et al., 1988). Scores can range from 0-63 with higher scores indicating higher levels of depressive symptoms. Scores over 13 are typically indicative of at least mild depression.

The Cognitive-Behavioral Avoidance Scale (Ottenbreit & Dobson, 2004; CBAS). The CBAS is a 31-item self report measure on which participants are asked to rate the degree to which they use various avoidant strategies to deal with problems. The scale has been shown to have good internal consistency and test-retest reliability as well as convergent and divergent validity (Ottenbreit & Dobson, 2004). The CBAS yields an overall composite avoidance score, which can range from 31-155 with higher scores representing higher avoidance. Subscale scores for cognitive-social, cognitive-nonsocial, behavioral social and behavioral non-social avoidance can also be derived. Higher subscale scores represent higher endorsement of a specific type of avoidance.

Subscales from the Dundee Stress States Questionnaire (Matthews, Joyner, Gilliland, Campbell, Falconer, & Huggins, 1999; DSSQ). The task-relevant cognitive interference and task-irrelevant cognitive interference subscales of the DSSQ were used to assess cognitive activity during the image viewing task. The subscales are 8 items each and are designed to measure stress during a specific task in response to thoughts about the task or unrelated thoughts. Higher scores indicate higher levels of task-relevant or task-irrelevant interference. The sub-scales have been shown to have internal reliability and to correlate with other measures of task related and task unrelated thinking (Matthews, Campbell, Falconer, Joyner, Huggins, Gilliland et al., 2002).

The Structured Clinical Interview for DSM-IV-I, Non-patient Edition (First et al., 2002; SCID-I/NP). The SCID-I/NP is the standard structured interview used for making DSM-IV-TR diagnoses (Diagnostic and statistical manual of mental disorders, 4th Ed. Text Revision, American Psychiatric Association, 1994). For this study, only the mood module of the SCID was used. The mood module has been shown to have reliability (Zanarini, Skodol, Bender, Dolan, Sanislow, Schaefer et al., 2000) and earlier but very similar versions of the SCID have been shown to be valid (Fennig, Craig, Lavelle, Kovasznay, & Bromet, 1995).

The State Version of the Multiple Affective Adjective Check List-Revised Edition (Zuckerman & Lubin, 1965; MAACL-R). The sadness subscale of the MAACL-R was used to measure the effect of the mood manipulations. The MAACL-R is a 132-item self-report mood checklist in which participants are asked to check

adjectives that describe how they feel at the particular moment they are filling out the questionnaire (Zuckerman & Lubin, 1965). The full MAACL-R has been shown to have construct validity and to correlate with other measures of momentary mood assessment (Lubin, Zuckerman, Hanson, Armstrong, Rinck & Seever, 1986).

The Recall Forms (unpublished). The Recall Forms were several queries to which participants could provide open-ended written responses. The task was intended to serve as a test of memory for emotional detail that might be somewhat more ecologically valid than more traditional memory tests. In written free-response, participants were asked to “*Describe the six most memorable pictures you saw*”. Subsequently, participants were asked to “*Describe the three most positive images you saw*” and “*Describe the three most negative images you saw.*” The order in which the positive versus negative queries were presented was counterbalanced. Participants were given no direction as to whether descriptions of positive and negative images could overlap with most memorable images. Written responses were transcribed and analyzed with Language Inquiry and Word Count (LIWC) software (Pennebaker, Booth & Francis, 2007).

The Recognition Form (unpublished, see Appendix B). The Recognition Form is a 45-item questionnaire created for use in the study. Items were statements that corresponded to each of the 45 images selected for the image viewing task. Approximately half of the items in each valence were true statements and approximately half of the items were false statements. Based on piloting of the measure, effort was made to create statements about relatively less salient image

characteristics (e.g., hair color, clothing) rather than emotional characteristics (e.g., a starving person) in order to avoid ceiling effects. The questionnaire asks participants to select whether each statement does or does not describe an image that was presented during the image viewing task. If the participants endorsed that a statement did describe an image, they were asked to specify whether the image was positive, negative or neutral in tone. Scores were computed by summing the total number of omissions and intrusions for each valence. The recognition measure was selected for use in this study over other possibilities (e.g., asking participants to identify which images had been previously viewed from a larger pool of images) based on pilot testing in which other recognition assessments yielded ceiling effects.

Response Styles Questionnaire –Ruminative Response Subscale-Short Form (Nolen-Hoeksema & Morrow, 1991). The Ruminative Response Scale (RRS) is a subscale of the commonly used Response Styles Questionnaire. It is designed to assess ruminative responses to sad moods. The short form (RRS-S) consists of 8 items that emerged from a factor analysis after removing items overtly referring to depressed mood (see Roberts, Gilboa, & Gotlib, 1998). The factors measured by the short form are called “introspection/self isolation” and “self-blame.” Total scores range from 8-32 with higher scores representing higher ruminative tendencies. The full 21-item RRS has good internal reliability (Nolen-Hoeksema & Morrow, 1991).

Thought Control Questionnaire-Distraction Subscale (Wells & Davies, 1994; TCQ). The TCQ is a 30-item questionnaire that measures specific strategies used to suppress unwanted thoughts. The Distraction subscale measures tendency to use

distraction as a suppression strategy. The scale was designed as a measure of general tendencies and was administered in that form. In addition, participants completed an adapted version of the subscale in which wording was changed from “generally” to “during the computer task” to orient participants toward completing it with respect to the image viewing task. The subscale scores range from 6-24 with higher scores representing higher reported use of distraction. The full scale has been shown to have moderate internal reliability, and convergent and discriminate validity as a measure of general tendencies (Wells & Davies, 1994).

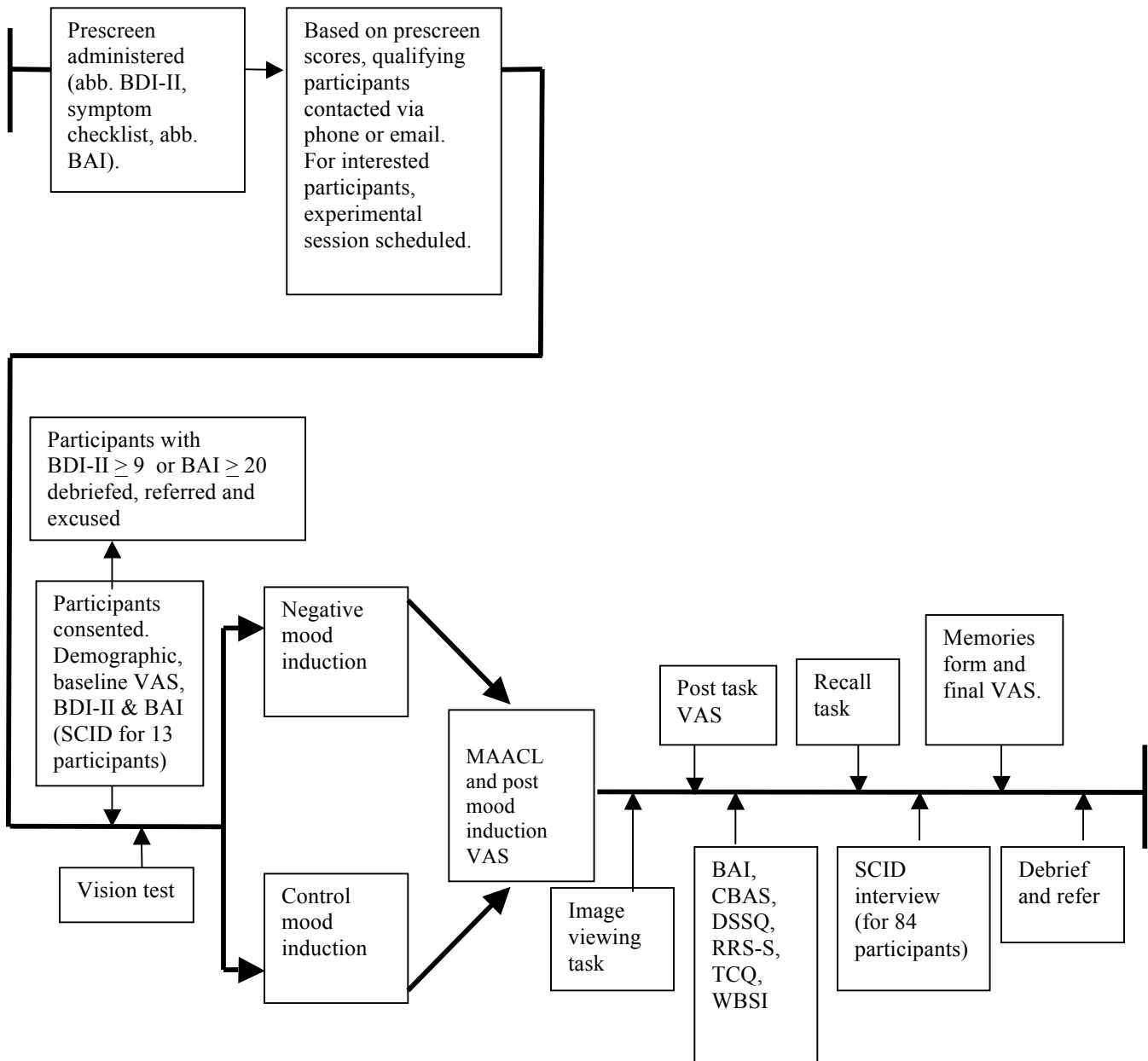
Visual Analog Scale (Oleson, unpublished; VAS). The VAS is a 10-centimeter line with an anchor on the left indicating “*not sad at all*” and an anchor on the right indicating “*very sad.*” Participants are instructed to make an *X* along the line to indicate how sad they are feeling in that moment (see Appendix C). Scores are calculated by measuring the distance, in centimeters, from the left anchor point to the center of the *X* made by the participant with higher scores representing higher sadness ratings.

The White Bear Suppression Inventory (Wegner & Zanakos, 1994; WBSI). The WBSI is a 15-item measure designed to assess chronic tendencies to suppress unwanted thoughts. Scores range from 15-75 with higher scores representing higher rates of thought suppression. The WBSI is widely used and has shown strong internal reliability, test-retest reliability and correlations with measures of distress regarding unwanted thoughts (Wegner & Zanakos, 1994).

Procedure.

The procedure is outlined in Figure 2.

Figure 2. Experimental session procedure.



After potential participants were identified via prescreen responses described previously, they were scheduled for an experimental session that was conducted on an individual basis. At the experimental session, those participants consenting to participation completed a demographic form, a visual analog scale, and the full BAI and BDI-II. For the majority of participants ($n = 84$), the BAI and BDI-II scores were used in order to verify that they had not become ineligible for RD or ND groups since the prescreen session. If BDI-II scores were greater than 9 or BAI scores were greater than 20, participants were debriefed, thanked for participation, and excused from the remainder of the study. However, due to practical constraints, the study procedure was modified midway through data collection such that a small number of participants ($n = 13$) also completed the SCID diagnostic interview following questionnaire completion. Those participants who did not qualify for ND or RD groups on the SCID were also debriefed, thanked and excused. Participants whose scores on the BAI, the BDI-II or SCID interviews disqualified them from the study were given a list of mental health resources before excusal. Remaining participants were given a brief vision test using a hand held eye chart. All participants had normal or normal-corrected vision.

Subsequently, participants underwent either a negative mood induction procedure or a control mood induction procedure. For both procedures participants were asked to wear headphones through which they heard a recorded set of instructions for the task. The instructions for the negative mood induction procedure asked that participants listen to music from the musical soundtrack of the movie *Field*

of Dreams while thinking about a sad event in their lives. The instructions also indicated that participants would be asked to write about the sad event later. This mood induction has been used in prior research and was found to be effective at inducing a mildly sad and transient mood (Ingram & Ritter, 2000; Ingram, Bernet, & McLaughlin, 1994; Steidtmann et al., 2010). For the control mood induction, recorded instructions directed participants to listen to a series of three-note sequences and to count the number of times they heard a target three-note sequence. Participants were asked to write down the number of times they heard the target sequence at the end of the study. Both mood induction procedures lasted approximately 7 1/2 minutes. Following the mood induction tasks, participants completed the MAACL-R and a visual analog scale.

Immediately following the MAACL-R, participants were seated in a dimly lit room in front of a computer screen. The image-viewing task included 45 emotional images (15 positive, 15 negative and 15 neutral images) that were presented one by one on a computer screen approximately 48 inches from the participant's faces. A black screen with a character mask in the middle appeared for 5 seconds between image presentations. Three specified orders of image presentation were used and counterbalanced across participants. In each of the orders, the presentation of negative, positive, and neutral images was mixed together. However, there were 5 images of each valence presented during each 1/3 of the task. In order to allow participants to self-select the length of time that they viewed each image, they were asked to do the following through both verbal and written instructions before

beginning the task: *“You are about to view a variety of pictures. After viewing them, you will be asked some general questions about the pictures. You are free to select how long you view each image. When you are finished viewing an image, press the ‘k’ key to advance to the next image. When you do, a black screen will appear for 5 seconds before the next image appears.”* Participants were instructed to use the keyboard to advance the images. In order to verify that participants understood the procedure, they completed a practice block of 10 neutral images prior to beginning the regular task. The practice responses were not included in analyses. The image viewing task was presented using E Studio Software and viewing time data was collected and stored via E Studio.

After finishing the image-viewing task, participants completed a visual analog scale and a questionnaire packet that included the CBAS, DDSQ, RRS-S, TCQ and WBSI. The order in which the questionnaires appeared in the packet was counterbalanced between five randomly selected orders (order 1 = RRS-S, CBAS, DSSQ, BAI, WBSI, TCQ; order 2 = CBAS, DSSQ, BAI, TCQ, RRS-S, WBSI; order 3 = CBAS, RRS-S, DSSQ, TCQ, WBSI, BAI; order 4 = TCQ, WBSI, BAI, CBAS, DSSQ, RRS-S; order 5 = DSSQ, BAI, RRS-S, TCQ, CBAS, WBSI). Following the questionnaire packet, participants completed the written recall tasks for the images. In the last part of the recall task participants completed the recognition form. At the end of all recall tasks, participants were presented with a notebook containing all the images presented during the viewing task. They were asked to identify which images

their written descriptions referred to and their responses were recorded for each of the 12 written descriptions.

Following the recall task, the mood module of the SCID was administered for those participants who had not already completed a SCID interview. Data collected from participants who were subsequently found not to meet SCID criteria for the RD or ND groups was not included in analyses. After SCID administration, participants who received the negative mood induction were asked to write a few sentences about the sad memory they thought about during the induction. They were also asked to write a few sentences about a happy memory in order to counteract any residual negative mood induction effects. Control mood induction participants were asked to indicate the number of target tones they had counted during the mood task. A final visual analog scale was administered to all participants. Lastly, participants were debriefed, thanked for their participation and given a list of local mental health resources.

Results

Data Cleaning

The dependent variables of primary interest were average viewing times for positive and negative images, percentage of words in recall descriptions that were of a negative tone, number of negative images recalled on the free recall image descriptions, and total number of negative recognition form items that were incorrectly not recalled. When the RD and ND group distributions of these variables were examined for normality, positive and negative viewing times and percentage of negative words were not normally distributed. Those variables were transformed using a natural log transformation. The transformed distributions yielded acceptable ratios of skewness and kurtosis to standard errors (ratios between ± 2). Further examination of the transformed distributions revealed a univariate outlier on negative viewing (score was more than 3 standard deviations below the mean). The outlier was excluded from all subsequent analyses. Thus, the final sample consisted of 97 participants with 44 in the RD group (22 control mood induction; 22 negative mood induction) and 53 in the ND group (26 control mood induction; 27 negative mood induction).

Additionally, several of the questionnaires measure outcomes were not normally distributed. In order to increase the normality of the DSSQ-task unrelated distribution, it was transformed using a natural log transformation. CBAS-cognitive nonsocial subscale, CBAS total and DSSQ-task related distributions were reflected

and transformed using inverse transformations. Transformations yielded acceptable levels of normality as evidenced by non-significant Shapiro-Wilks tests.

Preliminary Analyses

Demographic and descriptive statistics for the sample appear in Table 1.

Table 1. Descriptive statistics of the sample.

	Never Depressed		Recovered Depressed		Overall Sample	
	Control MI	Negative MI	Control MI	Negative MI	Control MI	Negative MI
N	26	27	22	22	48	49
Percent female out of total in cell	53.8	51.9	45.5	40.9	50.0	46.9
Percent Caucasian out of total in cell	92.3	92.6	90.9	77.4	91.7	85.7
Percent Hispanic-American or American Indian	0	7.4	0	9.0	0	8.2
Percent other than Caucasian, Hispanic-American or American Indian	7.7	0	9.1	13.6	8.3	6.1
Age <i>M(SD)</i>	18.9 (0.9)	19.2 (1.6)	19.6 (2.7)	19.3 (1.2)	19.2 (2.0)	19.3 (1.4)
Total experimental session BDI score <i>M(SD)</i>	3.2 (2.3)	3.5 (1.7)	4.1 (2.7)	3.6 (2.4)	3.6 (2.5)	3.5 (2.0)
Total experimental session BAI score <i>M(SD)</i>	4.0 (4.4)	3.7 (3.5)	5.2 (3.9)	4.0 (2.5)	4.6 (4.2)	3.8 (3.1)
Percent paid	0	0	9.0	13.6	4.2	6.1

RD and ND groups did not differ significantly on gender, ethnicity, age, experimental session BDI score or experimental session BAI score. However, all

participants recruited using the alternative paid recruitment procedure were recruited and qualified for the RD group. Thus, a preliminary ANOVA analysis was conducted to compare paid and unpaid participants. They differed significantly in a small but reliable amount from unpaid participants on age, $F(1,95) = 5.92, p < 0.05, \underline{M}_{\text{unpaid}} = 19.2$ yrs., $SD_{\text{unpaid}} = 1.67$ yrs. and $\underline{M}_{\text{paid}} = 21.0$ yrs., $SD_{\text{paid}} = 1.23$ yrs. With respect to dependent variables of interest, they also differed on average percentage of negative words out of total words recalled, $F(1,95) = 6.05, p < 0.05, \underline{M}_{\text{unpaid}} = 0.79, SD_{\text{unpaid}} = 0.57$ and $\underline{M}_{\text{paid}} = 1.44, SD_{\text{unpaid}} = 0.60$ and on average viewing time for negative images, $F(1,95) = 5.83, p < 0.05, \underline{M}_{\text{unpaid}} = 8.67, SD_{\text{unpaid}} = 0.58$ and $\underline{M}_{\text{paid}} = 8.03, SD_{\text{unpaid}} = 0.32$. Thus, a variable indicating payment status was included as a covariate in the primary analyses.

Mood Induction Manipulation

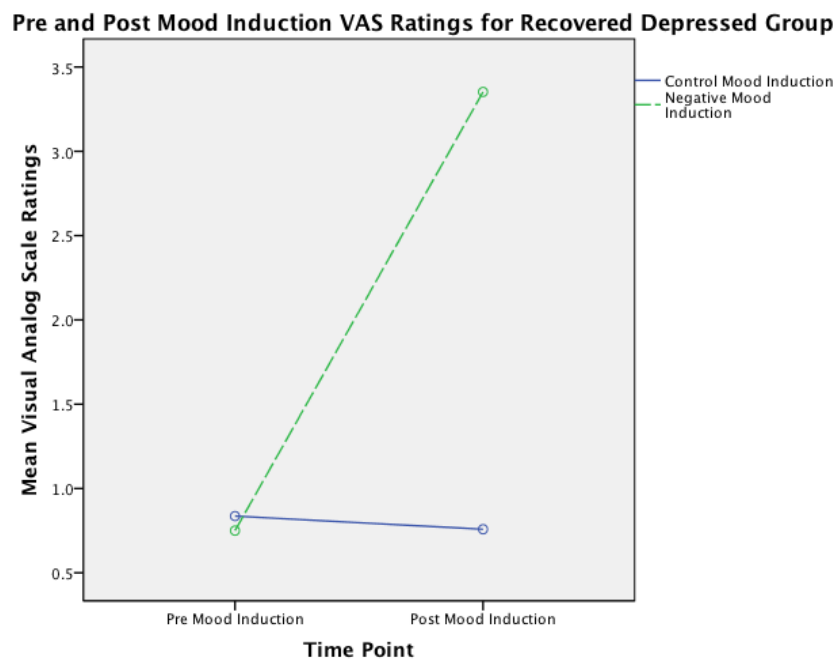
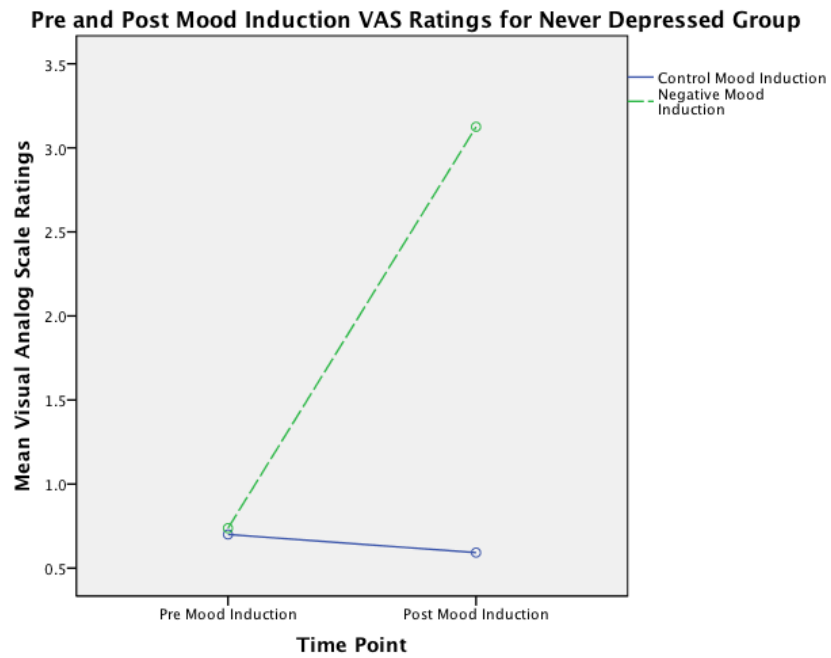
Levels of sad mood following the mood induction procedures were assessed by comparing sadness scores on the MAACL-R responses. For each of the items on the sadness sub-scale, participants were awarded 1 point for each negative item endorsed and 1 point for each positive item not endorsed. Thus, higher MAACL-R depression scores reflect higher levels of sad mood. Checks on the mood manipulations were performed using an ANOVA procedure to compare mean MAACL-R scores following the negative mood induction with mean MAACL-R scores following the control mood induction. MAACL-R scores were entered as a dependent variable with depression status (RD vs. ND) and type of mood induction (negative vs. control) entered as independent variables. As expected, there was a

significant main effect for type of mood induction such that mood was rated significantly more sad by those in the negative mood induction condition than by those in the control mood induction condition, $F(1,93) = 47.32$, $p < 0.001$, partial $\eta^2 = 0.34$, $M_{\text{negative}} = 19.37$, $SD_{\text{negative}} = 5.12$, $M_{\text{control}} = 12.48$, $SD_{\text{control}} = 4.70$. There was not a significant main effect for group, $F(1,93) = 2.57$, $p > 0.05$, partial $\eta^2 = 0.03$, suggesting that RD and ND groups did not differ significantly on mood following the mood inductions. In addition, the interaction between group and type of mood induction was not significant, $F(1,93) = 0.14$, $p > 0.05$, partial $\eta^2 = .00$, suggesting that the mood induction procedures affected RD and ND groups equivalently.

As a secondary evaluation of mood induction effects, the pre and post VAS scores among the control and negative mood induction conditions were compared using repeated measures ANOVA. Ten outliers on pre mood induction VAS ratings were excluded from the analysis (6 in RD group and 4 in ND group)¹. VAS time point was entered as a repeated measures dependent variable with depression status (RD vs. ND) and type of mood induction (negative vs. control) entered as independent variables. There was a significant mood induction type by time point interaction, $F(1,82) = 69.65$, $p < 0.001$, partial $\eta^2 = 0.46$. As can be seen in Figure 3, for both groups, sadness scores increased significantly from pre- to post in the sad mood induction condition but did not change significantly in the control mood induction condition. No other effects or interactions in the analysis were significant.

¹ The relatively high number of outliers was likely due to a subset of participants who reported that they interpreted the VAS directions differently than intended such that they marked near the middle of the line to indicate feeling no sadness rather than near the left most anchor to indicate feeling no sadness.

Figure 3. Pre and post mood induction ratings of never depressed and recovered depressed groups on visual analog scales.



Tests of Predicted Hypotheses

In order to evaluate the prediction that RD participants would spend significantly less time viewing negative images than ND participants, particularly following a negative mood induction, RD and ND responses were compared using an ANCOVA procedure. Depression status (RD versus ND) and type of mood induction (control versus negative) were entered as fixed factors and payment status (paid versus unpaid) was entered as a covariate. Mean viewing times for negative images was entered as a dependent variable. Contrary to predictions, after accounting for the effect of payment status, $F(1,92) = 8.07$, partial $\eta^2 = 0.08$, there were not significant effects of group, $F(1,92) = 2.53$, $p > 0.05$, partial $\eta^2 = 0.03$, or mood induction, $F(1,92) = 2.20$, $p > 0.05$, partial $\eta^2 = 0.02$, on viewing time of negative images. The group by mood induction interaction was also not significant, $F(1,92) = .229$, $p > 0.05$, partial $\eta^2 = 0.00$.

A MANCOVA was conducted to evaluate the prediction that RD participants would recall significantly less information about negative images than ND participants, particularly after a negative mood induction. Group and type of mood induction were entered as fixed factors and payment status was entered as a covariate. Dependent variables were mean number of words recalled when prompted to provide written descriptions of “the 3 most negative” images, the number of negative images selected in response to prompts for written descriptions of the “6 most memorable” images, and total number of true negative image descriptive statements not recalled on the recognition checklist. Contrary to predictions, after accounting for the effect of

payment, $F(3,90) = 3.79$, $p < 0.05$, partial $\eta^2 = 0.13$, MANCOVA analyses yielded non-significant effects of group, $F(3,90) = 1.63$, $p > 0.05$, partial $\eta^2 = 0.05$, and mood induction, $F(3,90) = 2.32$, $p > 0.05$, partial $\eta^2 = 0.07$, on recall for negative images. The group by mood induction interaction was not significant, $F(3,90) = 0.32$, $p > 0.05$, partial $\eta^2 = 0.00$. Means and standard deviations of dependent variables from primary analyses are listed in Table 2.

Table 2. Means and standard deviations of negative image outcome variables.

	Never Depressed		Recovered Depressed		Overall Sample	
	Control MI	Negative MI	Control MI	Negative MI	Control MI	Negative MI
Mean viewing time of negative images ^a <i>M(SD)</i>	8.53 (0.55)	8.65 (0.69)	8.60 (0.52)	8.79 (0.58)	8.56 (0.53)	8.72 (0.64)
Mean number of negative images recalled out of "6 most memorable" <i>M(SD)</i>	2.31 (1.38)	2.93 (1.44)	2.73 (1.32)	3.38 (1.12)	2.50 (1.35)	3.13 (1.32)
Mean word count for written descriptions of "most negative" images ^a <i>M(SD)</i>	2.42 (0.46)	2.58 (0.48)	2.34 (0.44)	2.32 (0.53)	2.38 (0.45)	2.47 (0.51)
Total number of descriptions of negative images not recognized <i>M(SD)</i>	3.00 (1.17)	2.96 (1.32)	3.09 (1.57)	3.27 (1.45)	3.04 (1.35)	3.10 (1.37)

^aValues reflect natural log transformations.

Exploratory Analyses

In order to evaluate the possibility that RD participants were distracting or repairing mood effects of negative images by viewing positive images for a longer time or by focusing recall on positive images, an ANCOVA comparing RD and ND

groups on positive viewing time was conducted. Group and mood induction procedure were entered as fixed factors and payment status was entered as a covariate. Mean viewing times for positive images was entered as a dependent variable. After controlling for the effect of payment status, $F(1,92) = 3.05$, $p > 0.05$, partial $\eta^2 = 0.03$, there was not a significant main effect of group, $F(1,92) = 0.83$, $p > 0.05$, partial $\eta^2 = 0.01$, or a significant main effect of mood induction type, $F(1,92) = 0.07$, $p > 0.05$, partial $\eta^2 = 0.00$. The interaction between group and mood induction type was also not significant, $F(1,92) = 0.78$, $p = 0.03$, partial $\eta^2 = 0.00$.

In addition, a MANCOVA comparing RD and ND groups on positive recall was conducted. Group and mood induction procedure were entered as fixed factors and payment status was entered as a covariate. Mean number of words provided when prompted to provide written descriptions of “the 3 most positive” images and the number of positive images selected in response to prompts for written descriptions of the “6 most memorable” images were entered as dependent variables. After controlling for the effect of payment status, $F(2,91) = 0.58$, $p > 0.05$, partial $\eta^2 = 0.01$, there was a significant main effect of group, $F(2,91) = 4.34$, $p = 0.02$, partial $\eta^2 = 0.09$. Post-hoc follow up tests revealed that the effect was due to a significant effect of group on number of positive images recalled among the 6 most memorable images, $F(1,92) = 4.12$, $p = 0.04$, partial $\eta^2 = 0.04$. Means and standard deviations of positive image outcomes variables are listed in Table 3.

Table 3. Means and standard deviations of positive image outcome variables.

	Never Depressed		Recovered Depressed		Overall Sample	
	Control MI	Negative MI	Control MI	Negative MI	Control MI	Negative MI
Mean viewing time of positive images ^a <i>M(SD)</i>	8.45 (0.40)	8.38 (0.69)	8.42 (0.46)	8.52 (0.50)	8.43 (0.42)	8.44 (0.61)
Mean number of positive images recalled out of "6 most memorable" <i>M(SD)</i>	2.54 (1.36)	1.70 (1.20)	1.59 (0.85)	1.59 (0.85)	2.10 (1.24)	1.65 (1.05)
Mean word count for written descriptions of "most positive" images ^a <i>M(SD)</i>	2.32 (0.49)	2.50 (0.50)	2.18 (0.40)	2.25 (0.57)	2.26 (0.45)	2.39 (0.54)

^aValues reflect natural log transformations.

As can be seen in Table 3, ND participants recalled significantly more positive images as the most memorable when compared to RD participants. There was also a trend for ND participants to provide longer written descriptions than RD participants in response to prompts for describing the most positive images, $F(1,92) = 3.07$, $p = 0.08$, partial $\eta^2 = 0.03$. There was no significant effect of mood induction on recall for positive images, $F(2,91) = 2.05$, $p > 0.05$, partial $\eta^2 = 0.04$, and the group by mood induction interaction was not significant, $F(2,91) = 1.79$, $p > 0.05$, partial $\eta^2 = 0.04$.

In order to assess whether length of viewing times were correlated with memory for image information, bivariate Pearson correlations between viewing time and several memory measures were calculated and appear in Tables 4 and 5.

Table 4. Pearson correlations among positive and negative image viewing times and memory measures for never depressed participants. Correlations within the control mood induction are listed first followed by correlations within the negative mood induction condition.

	1.	2.	3.	4.	5.	6.	7.	8.
1. Average negative image viewing times	1.0/ 1.0	.65**/ .93**	-.03/ -.37	-.04/ -.21	.38/ .16	-.29/ -.27	.20/ .09	.05/ .32
2. Average positive image viewing time		1.0/ 1.0	.05/ -.32	.00/ -.18	.12/ .20	-.25/ -.32	.24/ .18	-.06/ .41*
3. Negative image descriptions not recognized			1.0/ 1.0	.61**/ .35	-.35/ .04	.23/ .04	-.02/ -.17	-.05/ -.17
4. Positive image descriptions not recognized				1.0/ 1.0	.34/ .11	.15/ .19	-.27/ -.26	-.09/ -.27
5. Negative images recalled as most memorable					1.0/ 1.0	-.71**/ -.71**	.37/ -.17	.00/ -.21
6. Positive images recalled as most memorable						1.0/ 1.0	-.27/ -.03	.17/ .01
7. Word count for descriptions of most positive images							1.0/ 1.0	.75**/ .80**
8. Word count for descriptions of most negative images								1.0/ 1.0

*p < 0.05 **p < 0.01

Table 5. Pearson correlations among positive and negative image viewing times and memory measures for recovered depressed participants. Correlations within the control mood induction are listed first followed by correlations within the negative mood induction condition.

	1.	2.	3.	4.	5.	6.	7.	8.
1. Average negative image viewing times	1.0/ 1.0	.79**/ .91**	-.24/ -.29	.41/ -.08	.33/ -.23	-.18/ .20	.33/ .19	.32/ .41
2. Average positive image viewing time		1.0/ 1.0	-.18/ -.34	.45*/ -.15	.01/ -.41	.12/ .27	.07/ .22	.08/ .34
3. Negative image descriptions not recognized			1.0/ 1.0	-.23/ .18	-.45*/ .00	.21*/ .08	-.41/ -.31	-.20/ -.04
4. Positive image descriptions not recognized				1.0/ 1.0	-.17/ .17	.12/ .39	.06/ -.03	.24/ -.27
5. Negative images recalled as most memorable					1.0/ 1.0	-.53*/ -.39	.10/ -.07	.16/ -.23
6. Positive images recalled as most memorable						1.0/ 1.0	-.20/ -.22	.15/ .00
7. Word count for descriptions of most positive images							1.0/ 1.0	.75**/ .70**
8. Word count for descriptions of most negative images								1.0/ 1.0

*p < 0.05 **p < 0.01

Due to the high number of correlation coefficients calculated, correlations are interpreted with caution. However, there was a robust positive relationship between positive and negative viewing times for RD and ND groups in both types of mood induction conditions (Pearson's r ranging from .65 to .91). Other variables that were generally consistently related across groups and type of mood induction were word counts of positive and negative descriptions (Pearson's r ranging from .70 to .80), and negative and positive images recalled as most memorable (Pearson's r ranging from -.39 which was not significant to -.71). In addition, within the control mood induction condition, negative image descriptions not recognized were positively related to positive image descriptions not recognized for ND participants. They were also positively related to positive images recalled as most memorable for RD participants and negatively related to negative images recalled as most memorable for RD participants.

Correlations were also calculated between average viewing times of negative images, recall measures for negative images, and scores on questionnaire measures. Bivariate Pearson correlations appear in Tables 6 and 7.

Table 6. Pearson correlations among negative image viewing times and questionnaire measures for never depressed participants. Correlations within the control mood condition are listed first followed by correlations within the negative mood condition.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Mean negative image viewing time	1.0/ 1.0	.05/ .32	.38/ .16	-.25/ .08	-.09/ .04	.01/ -.18	-.15/ .03	.04/ .24	-.15/ -.11	.21/ .18
2. Word count of descriptions of most negative images		1.0/ 1.0	.00/ -.21	.24/ -.13	.32/ -.25	.00/ -.08	-.08/ .23	.08/ .16	.09/ -.06	-.13/ .06
3. Number of negative images recalled as most memorable images			1.0/ 1.0	-.07/ .00	-.09/ .02	-.20/ .18	-.05/ .29	.08/ .08	.02/ -.11	.11/ .00
4. CBAS total				1.0/ 1.0	.70**/ .82**	-.10/ -.19	.16/ -.19	.29/ -.11	.29/ .04	.35/ -.10
5. CBAS-cognitive nonsocial total					1.0/ 1.0	-.03/ .01	.28/ -.02	.25/ -.06	.14/ -.06	.08/ -.04
6. DSSQ-task related total						1.0/ 1.0	.39/ .37	.17/ .19	.39/ .05	.21/ .02
7. DSSQ-task unrelated total							1.0/ 1.0	.27/ .14	.15/ .09	.09/ .15
8. WBSI total								1.0/ 1.0	.35/ -.19	.34/ .61**
9. TCQ general total									1.0/ 1.0	.45*/ .04
10. RRS total										1.0/ 1.0

*p < 0.05 **p < 0.01

Table 7. Pearson correlations among negative image viewing times and questionnaire measures for recovered depressed participants. Correlations within the control mood condition are listed first followed by correlations within the negative mood condition.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Mean negative image viewing time	1.0/ 1.0	.32/ .30	.33/ -.01	.03/ -.30	.28/ .30	.09/ -.14	.11/ .32	.19/ -.07	.06/ -.13	-.16/ .32
2. Word count of descriptions of most negative images		1.0/ 1.0	.16/ -.23	-.16/ -.04	.43*/ .49*	-.25/ -.07	.38/ .16	-.02/ -.01	.05/ -.21	.30/ .20
3. Number of negative images recalled as most memorable images			1.0/ 1.0	-.16/ -.17	-.03/ -.07	.30/ .14	.32/ -.06	.28/ -.20	.41/ -.25	-.35/ -.28
4. CBAS total				1.0/ 1.0	.58**/ .83**	.16/ .51*	.11/ .27	.00/ .55*	.01/ -.09	.09/ .02
5. CBAS-cognitive nonsocial total					1.0/ 1.0	.03/ .04	.32/ .24	.09/ .26	-.15/ -.19	-.01/ .20
6. DSSQ-task related total						1.0/ 1.0	.12/ .32	.28/ .04	.27/ -.18	-.12/ -.19
7. DSSQ-task unrelated total							1.0/ 1.0	.58**/ .36	.30/ -.17	.24/ .11
8. WBSI total								1.0/ 1.0	.41/ .10	.21/ .46*
9. TCQ general total									1.0/ 1.0	.26/ .11
10. RRS total										1.0/ 1.0

*p < 0.05 **p < 0.01

Again, due to the high number of correlations, coefficients are interpreted with caution. Even so, negative image viewing time was not significantly related to any questionnaire measure in either mood induction condition for either group. Across groups and conditions, there were positive relationships between CBAS total scores and CBAS cognitive-nonsocial subscale scores. For the RD group, the DSSQ task unrelated scores and WBSI scores were also positively related in the control mood induction condition. However, that relationship was not present in the negative mood condition or in either condition for ND participants. For the ND group, WBSI scores were positively related to RRS scores but only within the negative mood induction condition.

Discussion

Summary of Current Results

The purpose of the current research was to assess whether people at risk for depression avoid paying attention to negative emotional information at a higher rate than those who have never been depressed. In addition, avoidance was assessed in the presence and absence of a negative mood induction, which was used as a lab analog for life stress. The results of the study do not provide support for cognitive avoidance in individuals at-risk for depression. Contrary to expectations, the at-risk group did not spend less time viewing negative images when compared to a never depressed group nor did they subsequently recall less information about negative images when compared to a never depressed group. There were no differences found between groups and this was true under a relatively higher stress negative mood induction

condition as well as a lower stress control mood induction condition. In exploratory analyses, at-risk and never depressed groups also showed no differences in viewing time of positive emotional images. However, following the picture viewing task, those in the never depressed group did recall more positive images as among the “6 most memorable” images than did members of the at-risk group. Thus, the current research suggests that the tendency to automatically recall positive information, which may possibly be used as a mood repair strategy, more often happens among a never depressed group than a group at-risk for depression.

Also contrary to expectations, correlational analyses showed no significant relationships between negative image viewing times and a variety of questionnaire measures including measures of distraction, thought suppression, cognitive and behavioral avoidance and rumination. Of note, in large part, the only robust correlations found were between different subtests involving the same methodological task (e.g., negative image viewing time correlating positively with positive image viewing time and negative word count correlating positively with positive word count).

Relationship to Existing Research and Theory

The current findings are inconsistent with prior research showing evidence for elevated rates of avoidance and related constructs among depressed people and those at risk for depression. Because no significant differences were found in length of negative viewing time or recall for negative images, results of the current study are also inconsistent with a large body of research showing increased attention to

negative information among those at-risk for depression (e.g., Ingram et al., 1998). It is possible that differences in how attention was measured account for the discrepant findings. Because the image-viewing and recall tasks used in the current study were novel, they may not have been sensitive measures of attention processes. For example, prior research has yielded conflicting results regarding whether depressed and at-risk groups have increased or decreased attention to negative information depending on time point at which attention is assessed (e.g. Steidtmann et al., 2010; Wenzlaff et al., 2001; Wenzlaff, Meier & Salas, 2002). In addition, it has been argued elsewhere that self-relevant stimuli are often necessary to reveal subtle biases, especially on tasks that do not require a deep level of processing (see Wisco, 2009 for a review). Because the tasks used in this study did not require a decisional response, the stimuli were presumably less deeply processed and thus, the use of stimuli that were not self-relevant may have failed to elicit tendencies either toward avoidance or increased attention to negative information.

Of note, the finding that the ND group recalled more positive images as “most memorable” than did the RD group is consistent with prior research examining the effect of dysphoria on recall processes. For example, it has previously been found that when compared to a nondysphoric group, dysphoric individuals are less likely to call to mind positive memories to recover from a sad mood. In addition they are less able than nondysphorics to recall positive memories even when directed to do so following a negative mood induction (Joorman & Siemer, 2004). Interestingly, in the current

study, levels of dysphoria were low in both groups. However, a difference still emerged based on depression history.

Current findings regarding questionnaire responses are also inconsistent with prior research. For example, previous findings of increased thought suppression on the WBSI (e.g., Rude & McCarthy, 2003) and elevated rumination on the RRS (e.g., Wisco & Nolen-Hoeksema, 2009) among those at-risk for depression were not replicated in this study. In addition, although correlations between avoidance on the CBAS and depressive symptoms have previously been found (e.g., Ottenbriet & Dobson, 2004), the RD group in this study did not have higher CBAS scores than the ND group. It is possible that the avoidance measured on the CBAS is primarily a state-specific construct that fluctuates with remittance of depressive symptoms. Alternatively, the current study recruitment procedures targeted a recovered depressed group that was also low in current anxiety symptoms. Because of the high co-occurrence of anxiety and depressive symptoms (see Brown & Barlow, 2009), it is possible that the recruitment of RD participants with low levels of anxiety symptoms yielded an unusual subset of at-risk people that differed in ways other than anxiety from depressed and at-risk groups used in other research.

Due to the lack of group differences revealed in the current study, placing the findings into a theoretical context is difficult. Even so, the finding that the ND group called to mind a greater number of positive images as most memorable does fit into a traditional cognitive theoretical framework of depression in which it is proposed that those who are depressed and at-risk for depression selectively filter out positive

information (e.g, Beck, 1967; 1976). Additionally, Brown and Barlow (2009) have recently called for a reconceptualization of mood and anxiety disorders due to high degrees of overlap among diagnostic criteria and presentation. They propose a transdiagnostic model for assessment along broad dimensions including neuroticism/inhibition, and positive affectivity. Indeed, the inclusion of inhibition in such a model seems to suggest that avoidance may well be present in affective disorders including depression. However, whereas an aim of the current study was to see if avoidance was present in a group at-risk for depression above and beyond avoidance that could be attributed to anxiety, the transdiagnostic model seems to suggest that discriminating “depressive avoidance” from “anxious avoidance” may not make conceptual sense.

Limitations

There are a number of limitations to the study. Due to difficulty in recruiting participants as well as institutional policy changes, several changes were made to the procedure midway through the study; Changes included providing payment for participation to a subset of participants as well as moving the diagnostic interview to an earlier time point during the experimental session. Although the effect of paying participants was accounted for statistically, the variation in methodological procedures was not ideal and likely contributed to increased error variance on outcome measures. In addition, as previously mentioned, the primary outcome measures were newly designed for the current study. Thus, the measures may not have been sensitive to variations in attentional and avoidant processes. Consistent

with that explanation, within group variability on the image-viewing task was large suggesting that other factors were influencing viewing time in the sample. In addition, although some of the recall measures were modeled after memory measures used in other studies (e.g., Williams & Scott, 1988) they were modified to be used in reference to the viewed images, which may have altered how sensitive they were to variations in attention and avoidance. Furthermore, because the at-risk group was also recruited to also be low in current anxiety symptoms, the ability to compare findings to other samples of recovered depressed individuals is limited.

Future Directions

Despite the limitations of the current study and the paucity of group differences, the question of if and how avoidance functions in the context of depression remains a timely and useful question, especially in light of the recent surge in depression interventions theorized to target aspects of avoidance (e.g., Hayes et al., 2005; Hayes et al., 2006; Forman et al., 2007; Teasdale et al., 2002). Given the apparently complex nature of attention within affective disorders, qualitative studies assessing thinking content over the course of varying degrees of stress as well as in response to varied instructions (e.g. to distract or to avoid) may provide further insights into the time course of attentional shifts among depressed and at-risk groups. In addition, such studies may suggest useful ways of objectively measuring avoidance. In turn, devising sensitive measures of avoidance would allow better understanding of if and when avoidance takes place in the context of depression, as well as the extent to which avoidance is modifiable among currently depressed or at-

risk people. Eventually, such studies may provide information about whether decreasing cognitive and emotional avoidance is indeed an active ingredient in various treatments designed to decrease depressive symptoms. Although the image-viewing task in the current study was not a sensitive measure of avoidance or attention, many performance based computer tasks have proven useful as attention measures in other contexts (e.g., Ingram et al, 1998, Wisco, 2009). In addition, if models such as Brown and Barlow's (2009) transdiagnostic model become more widely adopted, it may become less important to determine whether avoidance plays a role in depression apart from anxiety and more important to determine effective ways to measure avoidance within the context of complex emotional disorder. Ultimately, increased understanding of the degree to which various types of avoidance are present in emotional disorders that include depression may allow for more effective and efficient treatment.

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Appendix A.

1. Have you ever experienced a period of time during which you felt depressed or very sad for a period of at least two weeks (including the last two weeks)?
2. Did you receive any treatment for this depression, either with drugs or therapy?
3. If you answered yes to question number 1, please indicate which of the following you also experienced...

You were less interested or found less pleasure in most of your activities.

You experienced a significant change in your weight or appetite.

You had difficulty sleeping or were sleeping much more than normal.

You were so fidgety or restless that you were unable to sit still.

You were talking or moving more slowly than normal for you.

Your energy level was lower than normal for you.

You felt worthless or extremely guilty.

You had trouble concentrating, thinking, or making decisions.

You were thinking about death or that you would be better off dead.

Appendix B.

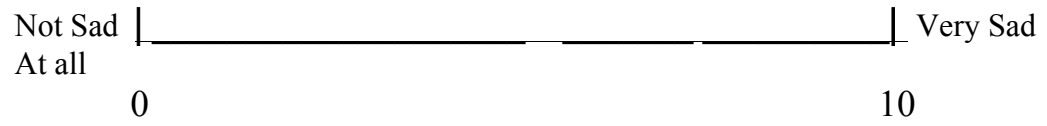
As you read the following set of statements, please indicate whether you saw a picture during the computer task that is described by that statement. If you believe you did not see a picture described by that statement circle "NO." If you believe you did see a picture described by that statement circle "YES." If you circle YES please indicate whether the picture you are thinking of was negative, positive or neutral in tone. Please only indicate YES if you directly observed the described statement in a picture (i.e. do not assume something that was out of view of the image).

I saw a picture that included:		If yes, what was the tone? (Circle one)				
1	A man in overalls	NO	YES	Negative	Positive	Neutral
2	A man in a blue tank top	NO	YES	Negative	Positive	Neutral
3	A woman in a pink sweater	NO	YES	Negative	Positive	Neutral
4	Two people wearing skirts	NO	YES	Negative	Positive	Neutral
5	A man in a green jacket	NO	YES	Negative	Positive	Neutral
6	Two people in orange visors	NO	YES	Negative	Positive	Neutral
7	A child with sunglasses on	NO	YES	Negative	Positive	Neutral
8	A man in a yellow button-down shirt	NO	YES	Negative	Positive	Neutral
9	A baby lying on a blanket	NO	YES	Negative	Positive	Neutral
10	A young child wearing a helmet	NO	YES	Negative	Positive	Neutral
11	A young girl with braces on her teeth	NO	YES	Negative	Positive	Neutral
12	A blue eyed man with a mustache	NO	YES	Negative	Positive	Neutral
13	Three people on bikes	NO	YES	Negative	Positive	Neutral
14	A person on a blue blanket	NO	YES	Negative	Positive	Neutral
15	A woman wearing a cowboy hat	NO	YES	Negative	Positive	Neutral
16	A person standing outside in the rain	NO	YES	Negative	Positive	Neutral
17	A girl in a white tee shirt	NO	YES	Negative	Positive	Neutral
18	A baby wearing overalls	NO	YES	Negative	Positive	Neutral
19	A stuffed animal	NO	YES	Negative	Positive	Neutral
20	A man working on a computer	NO	YES	Negative	Positive	Neutral
21	A man in a green vest	NO	YES	Negative	Positive	Neutral
22	Two men in red tank tops	NO	YES	Negative	Positive	Neutral
23	A man who was not wearing shoes or a shirt	NO	YES	Negative	Positive	Neutral
24	A woman in a white top and a man in a black top	NO	YES	Negative	Positive	Neutral
25	A woman in a yellow kerchief	NO	YES	Negative	Positive	Neutral
26	A man with sunglasses and no shirt	NO	YES	Negative	Positive	Neutral
27	A person with part of the face in shadow	NO	YES	Negative	Positive	Neutral
28	A baby's head supported by an adult hand	NO	YES	Negative	Positive	Neutral
29	A woman in a black suit and glasses	NO	YES	Negative	Positive	Neutral
30	Two people with gray hair	NO	YES	Negative	Positive	Neutral
31	A woman with a facemask on	NO	YES	Negative	Positive	Neutral
32	A child with curly hair	NO	YES	Negative	Positive	Neutral
33	A woman with straight black hair and bangs	NO	YES	Negative	Positive	Neutral
34	A woman sitting in front of a file cabinet	NO	YES	Negative	Positive	Neutral
35	A red haired man who was not wearing a shirt	NO	YES	Negative	Positive	Neutral
36	Three people in denim jackets	NO	YES	Negative	Positive	Neutral
37	A person wearing a tan shirt and hat	NO	YES	Negative	Positive	Neutral
38	A person wearing a glove and a red tank top	NO	YES	Negative	Positive	Neutral

39	A grey haired man with a mustache wearing sunglasses	NO	YES	Negative	Positive	Neutral
40	Two people wrapped in a blanket	NO	YES	Negative	Positive	Neutral
41	A woman in an orange skirt	NO	YES	Negative	Positive	Neutral
42	A man in a black cowboy hat	NO	YES	Negative	Positive	Neutral
43	A woman with curly hair and a red shirt	NO	YES	Negative	Positive	Neutral
44	A woman wearing a denim shirt	NO	YES	Negative	Positive	Neutral
45	A girl wearing a blue backpack	NO	YES	Negative	Positive	Neutral

Appendix C.

Instructions: Mark an χ on the line which indicates a range of feelings. For instance, if you were feeling “moderate sadness” you would indicate on the line below as such:



Please make your mark here:

