International Journal of Cognitive Therapy, 3(4), 389–401, 2010

The Effects of Experiential Avoidance and Rumination on Depression among College Students

Andri Bjornsson, Gregory Carey, Monika Hauser, Alexis Karris, Vyga Kaufmann, and Erin Sheets
University of Colorado at Boulder

W. Edward Craighead
Emory University

The article reports the results of three studies that compare the effects of experiential avoidance and rumination on depression among college students. Study 1 (N = 748) evaluated the cross-sectional association among rumination, experiential avoidance, and depression. Study 2 (N = 887) was a replication of Study 1. In Study 3, a subsample of 72 females was drawn from the larger sample of Study 1. In this prospective, longitudinal study, it was estimated whether rumination and experiential avoidance at Time 1 (the beginning of the semester) predicted depression symptoms 8 to 12 weeks later. When these constructs were measured cross-sectionally in Studies 1 and 2, an interaction effect was found between avoidance and rumination; avoidance was only associated with depression symptoms when rumination was high.

No interaction was found in the longitudinal study. Neither rumination nor experiential avoidance predicted depression symptoms at Time 2 when depression symptoms at Time 1 were entered as a covariate. These results are discussed with reference to future directions in comparing different dimensions of coping as they relate to depression.

During the last few decades, substantial research has been conducted in an effort to identify predictors of Major Depressive Disorder (MDD) and to understand the etiology of the disorder. At least one goal of this research was to design preventative interventions and effective treatments for the disorder. The growing literature on coping mechanisms has been an important resource for this research. The construct of "coping" can be defined as the ways in which a person responds to stressors (Skinner, Edge, Altman, & Sherwood, 2003). There is widespread consensus that certain cop-

The authors thank Linda Craighead, Victoria Cosgrove, Rebecca Gaffney-Brown, Christopher Jenkins, Charles Judd, Gary McClelland, Jon Roberts, Melody Sadler, Lucy Smith, Natalie WhiteFord, Kerry Trachsel, Laura Vanderdrift, and Mark Whisman for their help on this project. Andri Bjornsson is now at Warren Alpert Medical School of Brown University and Rhode Island Hospital.

Correspondence concerning this article should be addressed to Andri Bjornsson at Rhode Island Hospital, 1 Hoppin Street, Providence RI 02903. E-mail: Andri_Bjornsson@brown.edu.

ing strategies mediate the relationship between stress and disorders such as MDD (e.g., Felstein, 1998; Hayes, Wilson, Gifford, Follette, & Strosahl, 1996).

One of the most interesting conclusions of coping research for depression is that focusing on your problems can contribute to them, even to the point of triggering a depressive episode. This coping strategy has been labelled "rumination"; focusing on problems, emotions, and negative thoughts and actions, and thinking about what caused them and what they could lead to (see e.g., Papageorgiou & Siegle, 2003; Papageorgiou & Wells, 2003; and Treynor, Gonzales, & Nolen-Hoeksema, 2003). The reasons rumination might lead someone to become depressed have been well documented (see e.g., Lam, Schuck, Smith, Farmer, & Checkley, 2003; Papageorgiou & Siegle, 2003; Papageorgiou & Wells, 2003; Treynor et al., 2003). Rumination might prolong a somber mood by focusing on pessimistic thinking, and it might also interfere with productive solutions to problems (Nolen-Hoeksema, Parker, & Larson, 1994).

Some investigators have pointed out that the opposite strategy (i.e., avoidance of thoughts, emotions, and behavior) is not necessarily a better alternative to rumination (Nolen-Hoeksema & Jackson, 2001). It has long been a central tenet of behavioral therapy that depression is caused by avoidance of activities that were previously pleasurable (Ferster, 1973), and that avoidance results in less positive reinforcement, and increased rates of depression. Behavior activation is the most current behavioral treatment that emphasizes behavioral strategies to target avoidance and alter contingencies with the environment (Martell, Addis, & Jacobson, 2001). Proponents of both Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999) and Dialectical-Behavioral Therapy (DBT; Linehan, 1993) have argued that not only behavioral avoidance, but also avoidance of thoughts and emotions can lead to increased psychopathology. Even if we refuse to experience difficult emotions and thoughts, these phenomena will still persist and result in greater frequency and increased suffering. This has been well demonstrated by the phenomenon of *thought suppression* (Najmi, Wegner, & Nock, 2007; Wegner, Schneider, Carter, & White, 1987). The avoidance of emotions is not well understood, but proponents of ACT postulate that it works quite similarly to thought suppression (Hayes et al., 1999) and research suggests that suppressing negative emotions serves to increase the frequency of these emotions (Campbell-Sills, Barlow, Brown, & Hofmann, 2006). Experiential avoidance has been postulated as a factor in many disorders, among them anxiety (e.g., Zettle, 2003), alcohol use (e.g., Stewart, Zvolensky, & Eifert, 2002), generalized anxiety disorder (Roemer & Orsillo, 2002, for a review of the literature), anorexia nervosa (e.g., Hayes & Pankey, 2002; Orsillo, & Batten, 2002), and posttraumatic stress disorder (e.g., Tull & Roemer, 2003). However, experiential avoidance has not yet been linked with depression in a systematic way (see Hayes et al., 2004). Emotions normally have a short life; they ebb and subside. By experientially avoiding thoughts and emotions we amplify them (see e.g., Campbell-Sills et al., 2006) and emotions persist and become a mood. With regard to sadness, guilt, anger and hopelessness, and thoughts of worthlessness and hopelessness, experiential avoidance might lead to depressed mood over time.

There has been surprisingly little research regarding the relationship between avoidance and depression. Furthermore, there has been very little research on the association between rumination and avoidance (see Cribb, Moulds, & Carter, 2006, Moulds, Kandris, Starr, & Wong, 2007). This is actually a part of a bigger problem in the field of coping research: there have been few systematic efforts to compare different dimensions and central concepts (Blalock & Joiner, 2000; De Ridder, 1997). Attempts to create a coherent framework for related concepts such as vigilance and

cognitive avoidance (see especially Krohne, 1993) have largely been ignored. The aim of the current project, therefore, is to compare experiential avoidance and rumination and determine how they relate to depression.

One problem with the rumination literature is that, although Nolen-Hoeksema and colleagues do not deny the possibility of avoidance having an effect on depression, the one avoidance concept they measure in their research is distraction, which is mainly a behavioral phenomenon. The subscale on their Response Style Questionnaire (RSQ) which measures distraction comprises mostly behavioral activities that are unrelated to depression (e.g., "Do something that has made you feel better in the past"). The concept of avoidance that is of interest should be threefold (like rumination): cognitive, emotional, and behavioral. The only avoidance concept that encompasses all of those facets, is the aforementioned concept of experiential avoidance, which Hayes et al. (1996, p. 1154) 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, behavioral predispositions) and takes steps to alter the form or frequency of these events and the contexts that occasion them." Hayes and colleagues' concept of experiential avoidance is different from distraction, in that it encompasses multifaceted avoidance. This is the appropriate level of abstraction for comparing the two concepts.

How are experiential avoidance and rumination likely to be related? Some researchers have equated the concepts of experiential avoidance and rumination (Moulds et al., 2007), based on Borkovec and colleagues' theory that ruminative worry serves an avoidance function (e.g., Borkovec, Ray, & Stober, 1998). We contend, however, that this approach is misguided. It is important to distinguish between coping styles and *consequences* of those styles. Borkovec et al. (1998) and other researchers have demonstrated repeatedly that worrying is primarily a focus on verbal cognitions, which has the *consequence* of inhibiting emotional processing. In other words, by focusing on one aspect of our experience (worrying), the consequence is to avoid another aspect of our experience (emotional processing). It does not follow that rumination *is* avoidance. From a coping perspective, focusing on stressors is always the opposite coping strategy from turning away from stressors (see e.g., Krohne, 1993). It may very well be, however, that both strategies might have the same consequences, for example, a major depressive episode. In fact, we argue that *both* coping styles, rumination and experiential avoidance, might have similar consequences.

People who are more likely to focus on stressors (often referred to as *vigilance*) are much less likely to avoid them (Hock & Krohne, 2004; Krohne, 1993; Krohne, Egloff, Varner, et al., 2000). Given the lack of research comparing rumination and experiential avoidance as they relate to depression, we contend that people who display one of those coping styles are not likely to display the other. Avoidance and rumination, according to this line of reasoning, can both lead to depression, independently of each other. The first hypothesis is that rumination will predict depression symptoms over and above experiential avoidance. The second hypothesis is that experiential avoidance, in turn, will predict depression symptoms over and above rumination.

Three studies were conducted to cast light on these hypotheses. In Study 1 the participants consisted of 748 college students enrolled in an introductory psychology course. The participants, who received partial course credit, completed self-report questionnaires in the beginning of the Fall semester; these included measures of rumination, experiential avoidance, and depression. Because the beginning of a semester is a stressful time for a majority of students, it was considered an appropriate time for

assessing mediator variables between stress and depression. This study evaluated the association between rumination, experiential avoidance, and depression cross-sectionally. Study 2 consisted of a replication of Study 1, with 887 participants, enrolled in the same course a semester later. In Study 3, a subsample of 72 females was drawn from the larger sample of Study 1. In this prospective, longitudinal study, it was estimated whether rumination and avoidance at Time 1 (the beginning of the semester) predicted depression symptoms 8 to 12 weeks later.

METHOD

Participants

In Studies 1 (N = 815) and 2 (N = 898), students completed, on computer, a packet of self-report questionnaires soon after the beginning of the Fall (Study 1) or Spring (Study 2) semester, for partial course credit in an introductory psychology course. Of the 815 subjects in Study 1, 748 completed all of the self-report questionnaires reported on in this article (mean age 18.81, SD = 1.17, 62.7% females), and in Study 2, 887 participants completed all of the self-report questionnaires, out of a total of 898 students (mean age 18.96, SD = 1.01, 54.5% females).[1]

The sample in Study 3 consisted of 72 women drawn from the larger sample of Study 1 (mean age 18.75, SD = 0.97). Across the three studies, Caucasian students comprised 85.12%, Asian or Asian American were 5.9%, Chicana, Hispanic, or Latino were 5.24%, African American were 0.51%, and Native Americans or Pacific Islanders were 0.79% of the total. There was not a statistically significant difference in age between the larger sample (Study 1) and the subsample (Study 3), $t(870) = 1.16, p = .67$. Every female who had completed the self-report questionnaires at Time 1 was offered to participate. Participants scheduled the assessment session at Time 2 by a computerized system; thus, the sample in Study 3 was self-selected. Participants received course credit for their participation at Time 2 (8 to 12 weeks after the semester started). We recruited only females at Time 2 because of power considerations. College samples in general have a restricted range of depression, and men were not recruited because they are less likely to suffer depression. In order to get a representative sample of female college students, no other inclusion or exclusion criteria were used.

The 72 subjects in Study 3 were asked to reproduce an ID-code, in order to link the data from Study 1 (AAQ, RSQ, and BDI-II) to Study 3. However, it was not possible to link the data for 4 students. Three more students had missing data on the AAQ, RSQ, and BDI-II at Time 1 and were therefore omitted from the analyses.

Measures

Self-Report Measures

Acceptance and Action Questionnaire (AAQ). The AAQ is a 9-item measure of experiential avoidance (Hayes et al., 2004). An example of a test item is "I try to suppress thoughts and feelings that I don't like by just not thinking about them." A coeffi-

1. Four subjects, that were older than 23 years, were dropped from the analyses, to avoid an age cohort confound.

TABLE 1. Means and Standard Deviations of Depression Symptoms, Experiential Avoidance, Rumination and Distraction in the Three Studies

	Study 1 (n = 742)		Study 2 (n = 887)		Study 3 (n = 65)	
Measure	***M***	***SD***	***M***	***SD***	***M***	***SD***
BDI-II	8.43	7.88	9.57	8.79	8.95	7.63
AAQ	32.40	6.33	32.56	6.51	32.38	6.03
RSQ-Rum.	40.95	10.69	40.99	11.43	42.08	10.60
RSQ-Dist.	27.72	4.52	27.58	4.64	28.62	4.57

Note. BDI-II: Beck Depression Inventory-II; AAQ: Acceptance and Action Questionnaire; RSQ-Rum.: Response Style Questionnaire-Rumination Subscale; RSQ-Dist.: Response Style Questionnaire-Distraction Subscale.

cient alpha of .79 was reported for a nonclinical (albeit not a college) sample (Bond & Bunce, 2003). In the current three studies, Cronbach's alpha was 0.64, which is considered acceptable. The AAQ was found to demonstrate adequate convergent validity (e.g., .44-.50 correlation with a measure of thought suppression, and .49-.53 with one measure of general psychopathology) and discriminant validity (e.g., unrelated to one measure of social desirability) (Hayes et al., 2004).

Beck Depression Inventory, 2nd Edition (BDI-II). The BDI-II is a 21-item measure of depressive symptoms and their severity (Beck, Steer, & Brown, 1996). The BDI-II has been shown to have good reliability, for example, a coefficient alpha of .93 in a college sample. In the current three studies, Cronbach's alpha was 0.92. Adequate construct validity has also been shown (Beck et al., 1996; Carmody, 2005; Dozois, Dobson, & Ahnberg, 1998; Storch, Roberti, & Roth, 2004).

Response Style Questionnaire (RSQ). The RSQ is a 41-item questionnaire that measures rumination and distraction as methods of responding to a dysphoric mood. The subjects are instructed to indicate what they generally think or do when they feel down, sad, or depressed. The scale that measures rumination comprises 22 items (an example of a ruminative thought is "Why can't I get going?"). The rumination scale has good internal consistency (Cronbach's alpha of .89) in a college student sample. In the current studies it had a Cronbach's alpha of 0.92. The scale that measures distraction includes 13 items (an example of a distractive behavior is "Do something fun with a friend"). It had an internal consistency of .80 in a student sample (Nolen-Hoeksema & Morrow, 1991; see Nolen-Hoeksema, Parker, & Larson, 1994, for a validation study in a sample of bereaved adults). In the current studies, Cronbach's alpha was 0.74 for the distraction scale. The RSQ has been shown to have adequate convergent and predictive validity (Nolen-Hoeksema & Morrow, 1991).

Clinical Interview

Structured Clinical Interview for DSM-IV, Nonpatient Version (SCID). The SCID measures current and lifetime Axis I disorders as defined by the *DSM-IV*, including MDD (First, Spitzer, Gibbon, & Williams, 1995). It takes about 45 to 90 minutes to administer. It has been shown to have good interrater, and test-retest reliability, with an interrater kappa of .80 (Zanarini, Skodol, Bender, Dolan, Sanislow et al., 2000). Interrater agreement for MDD diagnosis in our research group has been very good (kappa = 0.79) in a randomly selected 20% of interviews in previous research using

TABLE 2. Correlations of Depression Symptoms, Experiential Avoidance, Rumination and Distraction in the Three Studies

	Measure	BDI-II	AAQ	RSQ-Rum
Study 1 (n = 742)	BDI-II	—		
	AAQ	.55***	—	
	RSQ-Rum.	.64***	.52***	—
	RSQ-Dist.	-.09*	-.10***	.08*
Study 2 (n = 887)	BDI-II	—		
	AAQ	.59***	—	
	RSQ-Rum.	.67***	.53***	—
	RSQ-Dist.	-.09**	-.12***	.14***
Study 3 Time 1 (n = 65)	BDI-II	—		
	AAQ	.54***	—	
	RSQ-Rum.	.76***	.57***	—
	RSQ-Dist.	.003	.08	.13
Study 3 Time 2 (n = 65)	BDI-II	—		
	AAQ	.70***	—	
	RSQ-Rum.	.73***	.59***	—
	RSQ-Dist.	-.11	-.12	-.07

Note. BDI-II: Beck Depression Inventory-II, AAQ: Acceptance and Action Questionnaire, RSQ-Rum.: Response Style Questionnaire-Rumination Subscale, RSQ-Dist.: Response Style Questionnaire-Distraction Subscale, *$p < .05$, **$p < .01$, ***$p < .001$.

the same interview. In this project, only the mood module (which measures MDD among other mood disorders) was used; this takes about 10 to 50 minutes to administer. We used number of depression symptoms as the unit of analysis. All raters were graduate students in clinical psychology who had completed supervised training in administering the SCID to undergraduates as part of an assessment course. The interrater reliability for the SCID (intra-class correlation; Shrout & Fleiss, 1979, Case 1) was very good in a randomly selected 29.2% of the interviews, with .90 for current number of depression symptoms, and .99 for number of depression symptoms in a past depressive episode.

Procedure

In Studies 1 and 2, volunteering college students completed a number of self-report questionnaires on a computer as a part of an introductory course in psychology during the first week of classes. This session took 1 to 1.5 hours. The BDI-II, RSQ, and AAQ were among the questionnaires the participants answered. The participants answered those three measures in about 20 to 30 minutes.

Seventy-two volunteering subjects from Study 1 participated in the evaluation at Time 2 (8 to 12 weeks after the initial evaluation in the beginning of the semester) for partial course credit (Study 3). The study was open to all females who had completed the self-report questionnaires at Time 1. The Time 2 session took place in the same building as the assessment at Time 1. Participants first completed the BDI-II, RSQ,

TABLE 3. Means and Standard Deviations of Depression Symptoms (as Measured by the SCID) and Correlations with Depression Symptoms (as Measured by BDI-II), Experiential Avoidance, Rumination and Distraction at Time 2

			Correlations at Time 2			
SCID variable	*M*	*SD*	**BDI-II**	**AAQ**	**RSQ-Rum**	**RSQ-Dist.**
Current sx	.83	1.41	.62***	.42**	.36**	-.13
Past ep. sx	2.28	2.91	.50***	.35**	.55***	-.07
Past n. ep.	.28	.48	.48***	.33**	.52***	-.19

Note. SCID: Structured Clinical Interview for DSM-IV Axis I Disorders; BDI-II: Beck Depression Inventory-II, AAQ: Acceptance and Action Questionnaire; RSQ-Rum.: Response Style Questionnaire-Rumination Subscale; RSQ-Dist.: Response Style Questionnaire-Distraction Subscale; Current sx: Current number of symptoms (at Time 2); Past ep. sx: Number of depression symptoms in a past major depressive episode, Past n. ep.: Past number of major depressive episodes.
$^{**}p < .01$, $^{***}p < .001$.

and AAQ on computer, under the guidance of an undergraduate research assistant. Next, clinical psychology graduate students (who were uninformed as to the scores on the self-report measures at Time 1 or Time 2) interviewed the participants with the SCID using only the mood disorders module. The questionnaires took about 20 to 40 minutes to answer. The mood disorders module of the SCID took between 20 and 50 minutes to administer. Thus, the total Time 2 session ranged between 40 and 90 minutes.

RESULTS

The means and standard deviations of the variables are presented in Table 1. The BDI-II scores in Studies 1-3 were, on average, considerably lower than Beck et al. (1996) report for a student sample ($M = 12.56$; $SD = 9.93$). Two other studies have reported comparable BDI-II scores to Beck's study (Storch et al., 2004, reported $M = 11.03$, $SD = 8.17$; Carmody, 2005, reported $M = 12.75$, $SD = 9.07$), with one study reporting similar BDI-II scores as were found in the present study (Dozois, Dobson, & Ahnberg, 1998, $M = 7.42$, $SD = 6.67$). Experiential avoidance and rumination means were comparable to previous research with student samples (Hayes et al., 2004, Nolen-Hoeksema & Morrow, 1991). No statistically significant differences were found between the four variables in the larger sample (Study 1) and the subsample (Study 3). Furthermore, there was no difference found in depression symptoms (as reported on the BDI-II) at the beginning of the semester between the larger sample (Study 1) and the smaller sample (Study 3), $t(810) = 0.513$, $p = .61$.

Correlations between the variables are presented in Table 2. As can be seen in Table 2, experiential avoidance is highly correlated with both depression symptoms and rumination in all studies. Rumination is also highly correlated with depression scores.

The mean and standard deviations of depression symptoms from the SCID are presented in Table 3. The correlations of the SCID variables (current symptoms, symptoms in the most recent MDE, past number of episodes) with avoidance, rumination, and distraction measured at Time 2 are also reported in this table. The SCID variables were highly correlated with rumination and avoidance, but not with distraction.

TABLE 4. Cross-Sectional Regression Analyses in Study 1 and Study 2, with Depression Symptoms (as Measured by BDI-II) as a Dependent Variable

	Model	Variable	*b*	R^2	*F*	*df*
Study 1	1	1. Avoidance	0.3	0.48	338.59***	2,739
		2. Rumination	0.49			
	2	1. Avoidance	-0.28	0.51	251.25***	3,738
		2. Rumination	-0.3			
		3. A × R	1.2			
Study 2	1	1. Avoidance	0.33	0.52	482.50***	2,885
		2. Rumination	0.49			
	2	1. Avoidance	-0.25	0.55	367.30***	3,884
		2. Rumination	-0.29			
		3. A × R	1.21			

Note. All regression coefficients (βs) are standardized. A × R: Interaction between Avoidance and Rumination.
***$p < .001$.

The research hypotheses were that, first, avoidance should predict depression symptoms over and above rumination, and, second, that rumination should predict depression symptoms over and above avoidance. They were not supported by the evidence. The regression analyses for Studies 1 and 2 are presented in Table 4. An interaction effect between avoidance and rumination was found to be statistically significant in both Studies 1 and 2 (Study 1: ß = 1.20, $t[740] = 6.36$, $p < .0001$; Study 2: ß = 1.21, $t[886] = 8.12$, $p < .0001$). The interaction effect is plotted in Figures 1 and 2. As can be seen by the Figures, when avoidance is low, there is no association between rumination and depression symptoms. For those subjects who are more highly avoidant, an increase in rumination is strongly associated with higher depression symptoms. The same interpretation applies to avoidance: The association between avoidance and depression symptoms depends on rumination, so that when rumination is low, an increase in avoidance scores has no effect on depression symptoms. However, when rumination is high, an increase in avoidance scores is associated with a sharp increase in depression symptoms.

The cross-sectional interaction effect between rumination and avoidance, that was previously reported in Study 1 and Study 2, was essentially replicated in Study 3 at Time 1, ß = 1.34, $t(59) = 1.95$, $p = .056$. Furthermore, it was replicated at Time 2, ß = 1.49, $t(59) = 2.56$, $p < .05$. When depression symptoms at Time 1 (as measured by BDI-II) were entered as a covariate along with all product terms in the cross-sectional analyses at Time 2, the interaction between rumination and avoidance still held, and was the only statistically significant interaction, ß = 3.17, $t(59) = 3.75$, $p < .001$. In summary, the cross-sectional interaction between rumination and experiential avoidance was reliable across three different studies.

The longitudinal regression analyses are presented in Table 5. Compared to the cross-sectional regressions, it is striking that there were no significant interactions between experiential avoidance and rumination at Time 1 in predicting depression symptoms at Time 2. With depression symptoms at Time 1 (as measured by BDI-II) as a covariate, neither rumination nor avoidance had a significant effect on depression symptoms at Time 2. BDI-II scores at Time 1 predicted BDI-II scores at Time 2 over and above both avoidance and rumination, ß = .46, $t(59) = 2.79$, $p < .01$. BDI-II

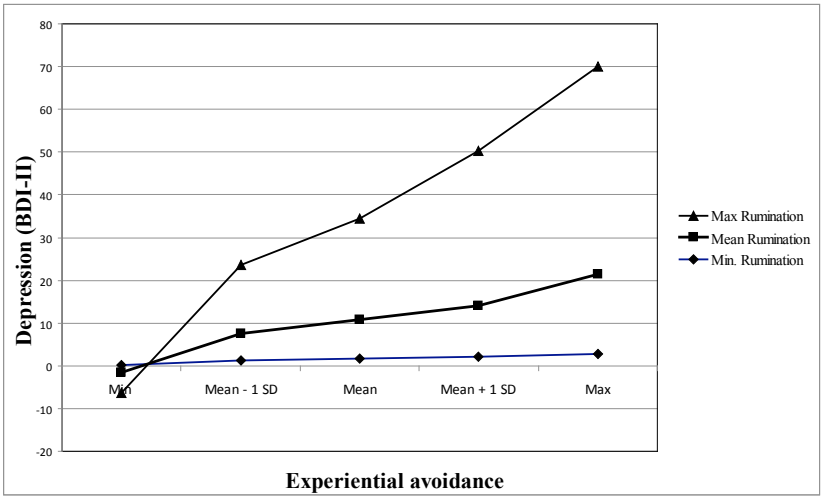

FIGURE 1. The Interaction of Experiential Avoidance and Rumination as They Relate to Depression Symptoms (as measured by BDI-II) in Study 1.
***Note*: BDI-II: Beck Depression Inventory-II, Max.: Highest score, Min.: Lowest score, SD: Standard Deviation.**

scores at Time 1 were not predictive of depression as measured by the SCID over and above rumination and avoidance, ß = .10, $t(59) = .56$, $p = .56$.

GENERAL DISCUSSION

The obtained data did not support the research hypotheses. Neither rumination nor experiential avoidance predicted depression symptoms in the longitudinal analyses over and above depression symptoms at Time 1. The explanation for this result (and the high correlations between AAQ, RSQ, and the measures of depression) might be, in part, that the experiential avoidance and rumination questionnaires are measuring depression symptoms.

How could RSQ and AAQ be measures of depression? Two examples should suffice: The item "I am able to take action on a problem even if I am uncertain what is the right thing to do" on the AAQ appears to be measuring something similar to what "I make decisions about as well as I ever could" on BDI-II is measuring. The item "Think about how sad I feel" on the RSQ seems to be measuring something similar to what "I feel sad much of the time" on BDI-II is measuring. However, they are probably not measuring exactly the same phenomenon, since the correlation (in Study 1) between the above "indecisiveness items" is only 0.16 and the correlation between the above "sadness items" is 0.56. If they were measuring exactly the same phenomenon we would expect a higher correlation between the items. It is, therefore, unlikely that this explanation can fully account for the results.

Another explanation might be the restricted range of depression symptoms in these samples. It should be noted that depression scores (as measured by BDI-II) were considerably lower in this series of studies than in 3 out of 4 published studies with college samples. Perhaps these results would not be replicated in a sample with

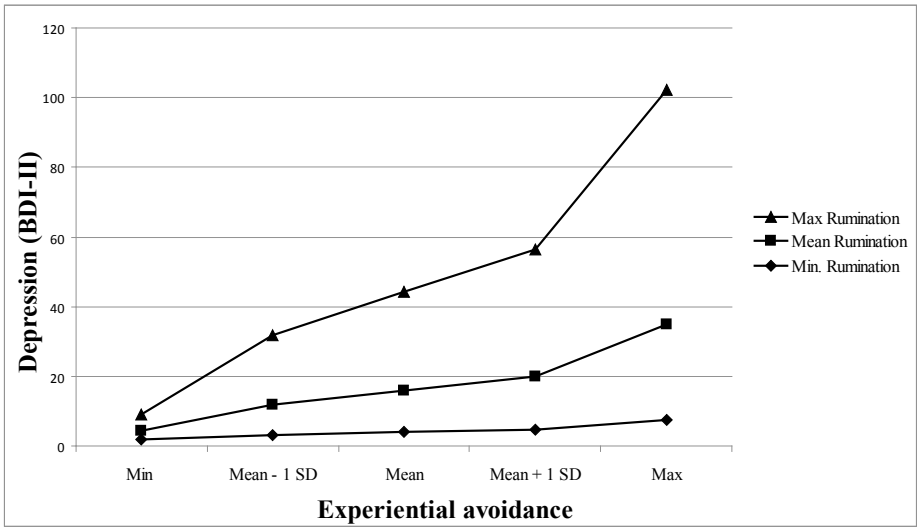

FIGURE 2. The Interaction Between Experiential Avoidance and Rumination as They Relate to Depression Symptoms as Measured by BDI-II) in Study 2.
***Note*. BDI-II: Beck Depression Inventory, Max.: Highest score, Min.: Lowest score, SD: Standard Deviation.**

a higher incidence of depression symptoms. However, the rate of previous depressive episodes matches the rate of Alloy and Abramson (1998) for college students, who found that about 25% of entering college students had experienced a major depressive episode.

An interesting interaction effect between rumination and avoidance was found in the cross-sectional analyses. For those subjects who are highly avoidant, an increase in rumination is associated with higher depression symptoms. The same interpretation applies to avoidance: The association between avoidance and depression symptoms depends on rumination, so that when rumination is low, an increase in avoidance scores has no effect on depression symptoms. However, when rumination is high, an increase in avoidance scores is associated with a sharp increase in depression symptoms. This interaction was still found cross-sectionally at Time 2 (in Study 3), after controlling for depression scores at Time 1. The previous hypothesis (about AAQ and RSQ being mostly measures of depression) can, therefore, not account for this cross-sectional result. These results point to the importance of comparing different dimensions of coping concepts. The association between avoidance and depression might depend on rumination, and the effect of rumination on depression might depend on avoidance.

How are we to make sense of being *both* ruminating and avoiding at the same time? The answer might lie in Krohne's (1993) conceptualization of the related concepts of vigilance and cognitive avoidance. When someone is high on both dimensions he calls it "fluctuating coping." He or she fluctuates between focusing on the problem and avoiding it. This coping style signals a breakdown in cognitive resources, which might be exactly what is going on as people are becoming depressed. This is not to say that rumination and avoidance are the *same* coping style (see e.g., Moulds et al., 2007), only that one can fluctuate from one style to another. Further research is needed to test this hypothesis.

TABLE 5. Two Longitudinal Regression Analyses in Study 3, with Depression Symptoms at Time 2 (as Measured by BDI-II and SCID) as a Dependent Variable, with BDI-II Scores at Time 1 as a Covariate

Dependent Variable	Independent Variables	β	R^2	*F*	*df*
BDI-II Depression Symptoms	1. Avoidance	0.08	0.36	10.71***	3.57
	2. Rumination	0.11			
	3. Depr. Time 1	0.46			
SCID Depression Symptoms	1. Avoidance	0.06	0.13	2.83*	3.57
	2. Rumination	0.23			
	3. Depr. Time 1	0.11			

Note. All regression coefficients (βs) are standardized. BDI-II: Beck Depression Inventory-II; SCID: Structured Clinical Interview for DSM-IV; Depr. Time 1: BDI-II scores at Time 1. No significant interactions were found between depression symptoms at Time 1 and any other variables; therefore, only 1 model is shown for each measure of depression symptoms. *$p < .05$, ***$p < .001$.

This interaction effect was not found in the longitudinal regression analyses. One possible explanation for this discrepancy between the longitudinal and the cross-sectional results is that AAQ and RSQ measure states rather than traits. Another possible reason is that more power is needed to detect the effect over time.

A replication of the longitudinal studies should be conducted before a definitive conclusion can be reached. Furthermore, a replication with a bigger sample might reveal whether *not* finding an interaction in the longitudinal data is a reliable finding. This last point is especially important in view of how difficult it is to find interaction effects in nonexperimental studies (McClelland & Judd, 1993), and the sample was small in Study 3.

Some limitations of this study should be noted. All self-report questionnaires were administered in computerized form. It is possible, although unlikely, that this way of administering the questionnaires may have biased the results. This possibility is mitigated by the fact that RSQ and AAQ scores were similar to earlier studies involving nonclinical samples. In addition, although BDI-II scores were in general lower than in 3 college samples, it was similar to one study, and, the general pattern of results (e.g., factor loadings[2]) were similar to past studies. No systematic biases seem to be present.

Another limitation of the study is that the sample in Study 3 was self-selected. It is possible that depressed individuals were unlikely to sign up for the study, and that this might be a part of the explanation for the restricted range of depression. However, there were also similar low depression scores at Time 1 in Studies 1 and 2, and it appears that no systematic biases were present in Study 3. Finally, it must be pointed out that the results of Study 3 only pertain to females.

Future directions include replications of the results in a different college setting, and with clinical populations, preferably with both genders at Time 2. It would also be of interest to broaden the RSQ and AAQ measures so that subscales of behavioral, emotional, and cognitive avoidance and rumination could be compared. Perhaps the complex interconnections between experiential avoidance and rumination must be distinguished at different levels of these concepts rather than at the three-fold (cognitive,

2. Factor analyses can be obtained directly from the first author.

emotional, behavioral) level of abstraction. Finally, these findings might have clinical applications. The "fluctuating" coping style between rumination and experiential avoidance might become an important target of assessment and clinical intervention.

REFERENCES

Alloy, L. B., & Abramson, L. Y. (1998). The Temple-Wisconsin Vulnerability to Depression Project: Prospective Incidence of Psychopathology and Implications for Prevention. Symposium Conducted at the 106th Annual Convention of the American Psychological Association, San Francisco, CA.

Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Beck Depression Inventory–Second Edition*. San Antonio, TX: The Psychological Corporation.

Blalock, J. A., & Joiner, T. E., Jr. (2000). Interaction of cognitive avoidance coping and stress in predicting depression/anxiety. *Cognitive Therapy and Research*, *24*(1), 47-65.

Bond, F. W., & Bunce, D. (2003). The role of acceptance and job control in mental health, job satisfaction, and work performance. *Journal of Applied Psychology*, *88*(6), 1057-1067.

Borkovec, T. D., Ray, W. J., & Stober, J. (1998). Worry: A cognitive phenomenon intimately linked to affective, physiological, and interpersonal behavioral processes. *Cognitive Therapy and Research*, *22*, 561-576.

Campbell-Sills, L., Barlow, D. H., Brown, T. A., & Hofmann, S. G. (2006). Acceptability and suppression of negative emotion in anxiety and mood disorders. *Emotion*, *6*(4), 587-595.

Carmody, D. P. (2005). Psychometric characteristics of the Beck Depression Inventory-II (BDI-II) with college students of diverse ethnicity. *International Journal of Psychiatry in Clinical Practice*, *9*(1), 22-28.

Cribb, G., Moulds, M. L., & Carter, S. (2006). Rumination and experiential avoidance in depression. *Behaviour Change*, *23*(3), 165-176.

De Ridder, D. (1997). What is wrong with coping assessment? A review of conceptual and methodological issues. *Psychology and Health*, *12*, 417-431.

Dozois, D. J. A., Dobson, K. S., & Ahnberg, J. L. (1998). A psychometric evaluation of the Beck Depression Inventory-II (BDI-II). *Psychological Assessment*, *10*(2), 83-89.

Felstein, G. (1998). Gender and coping: Use of distinct strategies and associations with stress and depression. *Anxiety, Stress, and Coping*, *11*, 289-309.

Ferster, C. B. (1973). A functional analysis of depression. *American Psychologist*, *28*, 857-870.

First, M. B., Spitzer, R. L., Gibbon, M., & Williams, J. B. (1995). *Structured clinical interview for DSM-IV disorder –nonpatient edition* (SCID-I/NP, Version 2.0). (Available from the Biometrics Research Department, New York State Psychiatric Institute, 722 West 168th Street, New York, NY 10032.)

Hayes, S. C., & Pankey, J. (2002). Experiential avoidance, cognitive fusion, and an ACT approach to anorexia nervosa. *Cognitive & Behavioral Practice*, *9*(3), 243-247.

Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (1999). *Acceptance and commitment therapy: An experiential approach to behavior change*. New York: Guilford.

Hayes, S. C., Strosahl, K. D., Wilson, K. G., Bissett, R. T., Pistorello, J., Toarmino, D., et al. (2004). Measuring experiential avoidance: A preliminary test of a working model. *The Psychological Record*, *54*, 553-578.

Hayes, S. C., Wilson, K. G., Gifford, E. V., Follette, V. M., & Strosahl, K. (1996). Experiential avoidance and behavioral disorders: A functional dimensional approach to diagnosis and treatment. *Journal of Consulting and Clinical Psychology*, *68*(6), 1152-1168.

Hock, M., & Krohne, H. W. (2004). Coping with threat and memory for ambiguous information: Testing the repressive discontinuity hypothesis. *Emotion*, *4*(1), 65-86.

Krohne, H. W. (1993). Chapter 2: Vigilance and cognitive avoidance as concepts in coping research. In H. W. Krohne (Ed.), *Attention and avoidance: Strategies in coping with awareness* (pp. 19-50). Seattle: Hogrefe & Huber.

Krohne, W. K., Egloff, B., Varner, L. J., Burns, L. R., Weidner, G., & Ellis, H. C. (2000). The assessment of dispositional vigilance and cognitive avoidance: Factorial structure, psychometric properties, and validity of the Mainz Coping Inventory (MCI). *Cognitive Therapy & Research*, *24*(3), 297-311.

Lam, D., Schuck, N., Smith, N., Farmer, A., & Checkley, S. (2003). Response style, interpersonal difficulties and social functioning in major depressive disorder. *Journal of Affective Disorders*, *75*, 279-283.

Linehan, M. (1993). *Cognitive-behavioral treatment of borderline personality disorder*. New York: Guilford.

Martell, C. R., Addis, M. E., & Jacobson, N. S. (2001). *Depression in context: Strategies for guided action*. New York: Norton.

McClelland, G. H., & Judd, C. M. (1993). Statistical difficulties of detecting interactions and moderator effects. *Psychological Bulletin*, *114*(2), 376-390.

Moulds, M. L., Kandris, E., Starr, S., & Wong, A. C. M. (2007). The relationship between rumination, avoidance and depression in a nonclinical sample. *Behaviour Research and Therapy*, *45*, 251-261.

Najmi, S., Wegner, D. M., & Nock, M. K. (2007). Thought suppression and self-injurious thoughts and behaviors. *Behaviour Research and Therapy*, *45*, 1957-1965.

Nolen-Hoeksema, S., & Jackson, B. (2001). Mediators of the gender difference in rumination. *Psychology of Women Quarterly*, *25*, 37-47.

Nolen-Hoeksema, S., & Morrow, J. (1991). A prospective study of depression and posttraumatic stress symptoms after a natural disaster: The 1989 Loma Prieta Earthquake. *Journal of Personality and Social Psychology*, *61*(1), 115-121.

Nolen-Hoeksema, S., Parker, L. E., & Larson, J. (1994). Ruminative coping with depressed mood following loss. *Journal of Personality and Social Psychology*, *67*(1), 92-104.

Orsillo, S. M., & Batten, S. V. (2002). ACT as treatment of a disorder of excessive control: Anorexia. *Cognitive and Behavioral Practice*, *9*, 253-259.

Papageorgiou, C., & Siegle, G. J. (2003). Rumination and depression: Advances in theory and research. *Cognitive Therapy and Research*, *27*(3), 243-245.

Papageorgiou, C., & Wells, A. (2003). An empirical test of a clinical metacognitive model of rumination and depression. *Cognitive Therapy and Research*, *27*(3), 261-273.

Roemer, L., & Orsillo, S. M. (2002). Expanding our conceptualization of and treatment for generalized anxiety disorder: Integrating mindfulness/acceptance-based approaches with existing cognitive behavioral models. *Clinical Psychology: Science and Practice*, *9*(1), 54-68.

Shrout, P. E., & Fleiss, J. L. (1979). Intraclass correlations: Uses in asssessing rater reliability. *Psychological Bulletin*, *86*(2), 420-428.

Skinner, E. A., Edge, K., Altman, J., & Sherwood, H. (2003). Searching for the structure of coping: A review and critique of category systems for classifying ways of coping. *Psychological Bulletin*, *129*(2), 216-269.

Stewart, S. H., Zvolensky, M. J., & Eifert, G. H. (2002). The relations of anxiety sensitivity, experiential avoidance, and alexithymic coping to young adults' motivations for drinking. *Behavior Modification*, *26*(2), 274-296.

Storch, E. A., Roberti, J. W., & Roth, D. A. (2004). Factor structure, concurrent validity, and internal consistency of the Beck Depression Inventory-Second Edition (BDI-II) in a sample of college students. *Depression and Anxiety*, *19*, 187-189.

Treynor, W., Gonzales, R., & Nolen-Hoeksema, S. (2003). Rumination reconsidered: A psychometric analysis. *Cognitive Therapy and Research*, *27*(3), 247-259.

Tull, M. T., & Roemer, L. (2003). Alternative explanations of emotional numbing of posttraumatic stress disorder: An examination of hyperarousal and experiential avoidance. *Journal of Psychopathology and Behavioral Assessment*, *25*(3), 147-154.

Wegner, D. M., Schneider, D. J., Carter, S. R., & White, T. L. (1987). Paradoxical effects of thought suppression. *Journal of Personality and Social Psychology*, *53*(1), 5-13.

Zanarini, M. C., Skodol, A. E., Bender, D., Dolan, R., Sanislow, C., Schaefer et al. (2000). The collaborative longitudinal personality disorders study: Reliability of Axis I and II diagnoses. *Journal of Personality Disorders*, *14*(4), 291-299.

Zettle, R. D. (2003). Acceptance and Commitment Therapy (ACT) vs. systematic desensitization in treatment of mathematics anxiety. *The Psychological Record*, *53*, 197-215.