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Do mindfulness, rumination or social problem-solving factors predict distress?

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**DO MINDFULNESS, RUMINATION OR SOCIAL PROBLEM-SOLVING
FACTORS PREDICT DISTRESS?**

by

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A Thesis

Submitted to the
Department of Psychology
College of Science and Mathematics
In partial fulfillment of the requirement
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Thesis Chair: Jim A. Haugh, Ph.D.

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Abstract

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DO MINDFULNESS, RUMINATION OR SOCIAL PROBLEM-SOLVING FACTORS
PREDICT DISTRESS?

2014-2015

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Master of Arts in Clinical Mental Health Counseling

Depression and anxiety continue to be prevalent concerns, with lifetime prevalence rates of 41% for depressive symptoms and 15% for anxious symptoms. Reputable studies confirm that high self-reported mindful awareness and social problem solving are both individually related to a lower severity of self-reported depressive symptoms. Rumination has also been found to have a significant relationship with depressive and anxious symptoms. Yet, these etiological factors have not been studied in combination, which is the focus of the current study. Hypothesis 1: Mindfulness, rumination, and social problem-solving will predict depressive symptoms after controlling for the variance predicted by Time 1 (T1) depressive symptoms. Hypothesis 2: Mindfulness, rumination, and social problem-solving will predict depressive symptoms after controlling for the variance predicted by Time 1 (T1) depressive symptoms. Hypothesis 3: Mindfulness, rumination, and social problem-solving will predict anxious symptoms after controlling for the variance predicted by T1 anxious symptoms. Analysis included two separate hierarchical linear regressions to evaluate how these predictor factors influence the criterion variables of interest. Based on the correlations examined, there are significant relationships between mindfulness, rumination and SPS and depressive and anxious symptoms. However, these variables did not significantly predict depressive and anxious symptoms prospectively after controlling for symptoms reported at T1.

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Chapter 1

Introduction

Depression and anxiety continue to be prevalent concerns, with lifetime prevalence rates of 41% for depressive symptoms and 15% for anxious symptoms in the general population (Fusar-Poli, Nelson, Valmaggia, Yung, & McGuire, 2012). If there is evidence that these things exist at a high rate, it behooves us to understand why people come to experience them. This study is an attempt to better understand what factors make people vulnerable to depression and anxiety. Rumination, social problem-solving, and mindfulness have been shown in the literature to be interrelated to the criterion variables of interest, individually. However, these etiological factors have not been studied in combination. By studying them in combination we can see how each of them collectively and individually predicts depression and anxiety.

Statement of the Problem

Previous literature suggests a significant interrelationship between mindfulness, rumination, social problem-solving (SPS) and negative affect, specifically depressive and anxious symptoms. Although the relationships between mindfulness, SPS, and rumination with depressive and anxious symptoms have been previously established in cross-sectional research, there are a lack of studies examining the longitudinal relationship among these variables. Furthermore, these variables have typically been studied in isolation; the current study evaluated the three variables in combination in order to evaluate their predictive contribution to depressive and anxious symptoms over time.

Significance of the Study

The current study aimed to obtain a better understanding of the etiological factors that predict depressive and anxious symptoms over time. Better understanding of these factors may facilitate future treatment developments. In addition, findings may further support mindfulness-based therapeutic practices such as Mindfulness-Based Cognitive Therapy and problem-solving techniques utilized in Cognitive Behavioral Therapy for depression and anxiety.

Hypothesis

Hypothesis 1: T1 depressive and anxious symptoms are predicted by T1 mindfulness, rumination, and SPS factors. Hypothesis 2: Mindfulness, rumination, and social problem-solving will predict depressive symptoms at Time 2 (T2) after controlling for the variance predicted by Time 1 (T1) depressive symptoms. Hypothesis 3: Mindfulness, rumination, and social problem-solving will predict anxious symptoms at T2 after controlling for the variance predicted by T1 anxious symptoms.

Purpose of the Study

A cross-sectional study conducted by Argus and Thompson (2008), examined how high self-reported mindful awareness and SPS were individually related to a lower severity of self-reported depressive symptoms. However, one limitation of this study is that mindfulness and SPS were studied in isolation. As such, Argus and Thompson (2008) urged future studies to take into consideration the relationship between mindfulness and SPS in relation to depressive symptoms. There is a plethora of research,

like that of Argus and Thompson (2008), which study mindfulness, rumination and SPS in isolation. However, these etiological factors have not been studied in combination. The current study evaluated how these factors collectively and individually contribute to the prediction of depression and anxiety. Expanding on Argus and Thompson's (2008) call for further research, the current research will also use a variety of measures beyond those used by their research, which will be further discussed in Chapter 3.

The purpose of the current study is to a.) replicate the results of the previous studies and b.) expand those results by examining these relationships using a brief, longitudinal design and including all three variables as predictor variables. The inclusion of all three variables will allow us to examine the unique and cumulative variance associated with each variable. In order to inquire the predictive influence rumination, social problem-solving and mindfulness factors have on depressive and anxious symptoms over time, participants will be evaluated with the same measures at two different time periods, separated by a six week time interval. It is expected that these predictive factors during T1 will influence depressive and anxious symptoms at T2.

Chapter 2

Literature Review

As noted, this study intends on evaluating three variables in relation to their predictive influences on depression and anxiety. Of all the mental health disorders, depression ranks third amongst disorders responsible for global disease burden (Murray & Lopez, 1998). Depressive symptoms may include low self-esteem, lack of motivation, anhedonia, somatic complaints, difficulties concentrating, or intense sadness (American Psychiatric Association, 2013). Depression is also one of the highest diagnosed psychiatric disorders (Segal, Williams, & Teasdale, 2013). Unfortunately, depression rarely occurs on its own, with the most common disorders associated with depression being anxiety (Sargeant, Bruce, Florio, & Weissman, 1990). Anxious symptoms may include excessive worrying, restlessness, fatigue, irritability, muscle tension, sleep disturbance, or difficulties concentrating (American Psychiatric Association, 2013). Approximately 80% of individuals meeting criteria for an anxiety disorder also met criteria for another mood disorder, most frequently depression (Craighead, Miklowitz, Craighead, 2013).

While professionals in the field have confirmed a significant relationship between depression and anxiety, the current study's focus is on the predictive relationship rumination, social problem-solving and mindfulness have with these two mental health disorders. During the 1990's Nolen-Hoeksema focused her time on investigating marked differences in people's reaction to depressive moods. She found that some individuals responded to depressive moods by acting in ways that focused their attention on

themselves. As she defined it, rumination is a repetitive self-focus on one's negative emotional causes, symptoms, and consequences. This cognitive process has been shown in prospective designed research to exacerbate negative mood and be a significant predictor of depressive symptoms (Hong, 2007). According to Nolen-Hoeksema (1991) individuals are more likely to engage in this type of response style during depressive episodes and often time report having difficulties disengaging from it. This response style was also found to maintain and intensify negative moods and increase the risk of future depressive symptoms (Segal, Williams, and Teasdale, 2013).

In addition, research findings have also suggested that rumination is a passive technique rather than an active problem-solving strategy (Nolen-Hoeksema, 2000). A cross-sectional study conducted by Donaldson & Lam (2004) suggested that those who ruminate are less likely to engage in effective problem-solving. Morrow (1990) examined a group of individuals who underwent a negative mood induction and then assigned the individuals to either engage in rumination or in distraction. When asked to generate solutions to a problem, results suggested that the individuals who were asked to ruminate provided less effective solutions to problems than those in the distraction group. Other cross-sectional studies have found that rumination exacerbates any preexisting depressed mood and impairs social problem-solving in the context of negative mood (Lyubomirsky & Nolen-Hoeksema, 1995; Lyubomirsky et al., 1999). By impairing social problem-solving, rumination leaves the problem unresolved, thus continuing to trigger and maintain further rumination and negative mood (Harvey, Watkins, Mansell, & Shafran, 2004).

Research confirms that individuals who ruminate are likely to practice ineffective social problem solving, resulting in a cycle of depression due to unresolved issues. While this sheds light on the predictive value of rumination and social problem-solving in relation to depression and anxiety, it is important to review the literature on social problem-solving and its relationship with anxiety and depression to further highlight its importance in the current study. A well-known type of problem-solving is social problem-solving (SPS). SPS is a multi-dimensional coping process of solving a problem as it occurs in the real world (D’Zurilla & Nezu, 1982). According to D’Zurilla, Nezu, & Maydeu-Olivares (2002) SPS includes two cognitive-motivational processes, positive problem orientation (PPO) and negative problem orientation (NPO), and three skills components; rational problem solving (RPS), impulsivity-carelessness style (ICS), and avoidance style (AS). Effective problem solving is defined as a process in which positive problem orientation aids rational problem solving in order to develop positive outcomes. In contrast, ineffective problem solving is a process in which negative problem orientation facilitates impulsivity-carelessness style or avoidance style and contributes to negative outcomes (Chang, D’Zurilla, Sanna, 2004).

College students and adults with depressive symptoms have been found to produce less effective solutions (Marx, Williams, & Claridge, 1992) and have more negative expectations and appraisals of their overall problem solving abilities (Blankstein, Flett, & Johnson, 1992) when compared to non-depressed individuals. Similarly, a study examining adult women who endured anxious symptoms found that they also reported significantly lower scores on problem-solving performance (Brodbeck & Michelson, 1987).

Research studies conducted on SPS have found that impairments in SPS seem to be characteristic of both clinical depression and anxiety (Billings, Cronkite & Moos, 1983; Marx, Williams & Claridge, 1992). Ineffective SPS has been suggested to play a significant role in both depression and anxiety disorders (Beck, 1976; Nezu, 1987). However, clarification on what dimensions are significantly related to depression and anxiety remains unclear. For example, Haaga, Fine, Terrill, Stewart & Beck (1995) examined the relationship between SPS, depression, anxiety, and dependency amongst a group of college students. Results from their study concluded that problem-solving orientation were significantly and negatively correlated with depression, anxiety, and dependency however significant findings were not found amongst problem-solving skills.

In contrast, Haugh (2006) evaluated the relation between SPS, depression and anxiety amongst 245 undergraduate students. Results from this study found that SPS was significantly related to depression and anxiety symptoms. However when anxiety was statistically controlled, findings remained significant only to depressive symptoms. And while these studies not only highlight the relationship between social problem-solving and depression and anxiety, they are especially important to examine in relation to the current study, because the target population, like the current study, was college students.

While there is evidence to support significant relationships between problem solving, rumination, anxiety, and depression; mindfulness also appears to be related to depression and anxiety. Mindfulness is defined as “the awareness that emerges through paying attention on purpose, in the present moment, and non-judgmentally to things as they are” (Williams, Teasdale, Segal & Kabat-Zinn, 2007, p. 47). The concept of

mindfulness is derived from Eastern philosophies and has been utilized as an fundamental part of various forms of psychotherapy for several health concerns including pain, anxiety, depressive relapse, and individuals with terminal illness (Grossman, Niemann, Schmidt & Walach, 2004; Hofman, Sawyer, Witt, & Oh, 2010). Mindfulness is considered an adaptive skillset, and has been found to have a negative relationship with depressive and anxious symptoms (Kaviani et al., 2011). In addition, mindfulness is believed to equip individuals with ways to respond appropriately to stress and develop strategies to help people get out mental reactions (such as rumination) that inhibit effective problem-solving (Kabat-Zinn, 1994).

Burg & Michalak (2011) examined the relationship between mindfulness, rumination, and depressive symptoms by training participants in a mindfulness-based breathing exercise. Results from this study found mindfulness to be negatively correlated with rumination and depressive symptoms. The opposite was also found to be true, in that those with high levels of rumination and depressive symptoms had lower levels of mindfulness. These findings support the idea that rumination, mindfulness, and negative affect are inter-related constructs.

Mindfulness has been described as an adaptive skill set that takes the individual out of a ruminative mindset and allows cognitive space to facilitate effective problem-solving (Segal, Williams, and Teasdale, 2013). This is notably different than rumination, a passive technique (Nolen-Hoeksema, 2000), which discourages active and effective social problem-solving (Nolen-Hoeksema, 2000; Donaldson & Lam, 2004). And while

they are notably different, both have a predictive value in relation to depression and anxiety. As such, the researcher found it important to include both in the current study.

There is evidence to support the relationship amongst rumination, SPS, and mindfulness and depressive and anxious symptoms; however research supporting their predictive value is limited, particularly research that includes all three variables. Hong (2007) suggested that rumination is a significant predictor of depressive symptoms; however these findings failed to evaluate other influencing variables such as SPS or mindfulness. Miner and Dowd (1996) found that problem solving predicted significant variance in depression, anxiety, and anger in undergraduates. However, their findings were also limited to only problem-solving. Lastly, mindfulness has been found to offer a number of possibilities for approaching relapse prevention in depressive symptoms. Mindfulness factors and techniques taught in therapeutic treatments (such as Mindfulness-Based Cognitive Therapy) have proven to help individuals disengage from ruminative and self-perpetuating modes of mind during depressive states (Segal, Williams, and Teasdale, 2013). Previous studies have found significant relationships amongst these variables and negative affect, unfortunately how these three factors predict depressive and anxious symptoms over time has not been examined. By studying them in combination, we can see how each of them collectively and individually predicts depression and anxiety over time.

Chapter 3

Methodology

Context of the Study

The current study utilized a convenience sampling method. Participants included undergraduate students from a mid-sized university in the northeastern part of the United States. Participants were recruited through an online study management system called SONA-systems. Participants were informed of research credit opportunities by their professors and referred to SONA-systems to register for the current study. Participation was voluntary and individuals who participated were able to obtain research credit towards their course requirements. The current study gathered a total of 113 participants for T1 and 89 of these participants returned for T2. Data was collected at two separate times; separated by a six week interval. In order to protect confidentiality, each participant was assigned a number to which only the Principal Investigator and the study coordinator had access to. All of the data collected during this study was evaluated using the Statistical Package for the Social Sciences (SPSS) version 21.

Instrumentation

Demographics. Basic demographic information was requested from each participant, including age, gender, and ethnicity.

Beck Depression Inventory- Second Edition (BDI-II). The Beck Depression Inventory- Second Edition (BDI-II) Beck, Steer & Brown, 1996) is a 21 item self-report

measure that assesses depressive symptoms. The BDI-II is used to assess the prevalence and severity of depressive symptoms experienced over the past two weeks and the present day. The BDI-II assess feelings such as sadness, failure, guilt and measures changes in appetite, pleasure, concentration, energy, sleep and interest in sex. Participants are instructed to rate how much each symptom bothers them on a 4-point scale from 0 (*no symptoms*) to 3 (*severe symptoms*). Scores on all items are added to obtain a total score that ranges from 0-63 in which higher scores indicate an increase in depressive symptoms. Psychometric properties for the BDI-II have demonstrated good internal consistency with a Cronbach's alpha of .92-.93 (Osman, et al., 2008).

Beck Anxiety Inventory (BAI). The BAI (Beck & Steer, 1993) is a 21-item self-report questionnaire that assesses the type and severity of current anxious symptoms. Items are rated on a 4-point scale, with higher scores indicating more severe anxiety symptoms. The BAI is used to assess the severity of anxious symptoms that the participants have been experiencing over the past week. Participants are asked to rate how much each symptom bothers them during the previous week using a 4-point scale ranging from 0 (*Not at all*) to 3 (*Severely*). Score on all items are added to obtain a total score that ranges from 0 to 63, with higher scores indicating greater levels of anxious symptoms. The BAI has a high internal consistency of 0.92. The BAI also demonstrates high test-retest reliability with a test-retest coefficient of 0.75 over a one-week period. The BAI demonstrates good discriminant validity. Additionally, the BAI demonstrates good convergent validity. The correlations between the BAI and other related measures (HARS-R and CCL-A) are generally positive and high (Beck et al. 1988).

Ruminative Response Scale-Short Form (RRS-SF). The RRS-SF (Nolen-Hoeksema & Morrow, 1991) is a 10 item self-report questionnaire that measures an individual's tendency to respond to feelings of sadness and depression with rumination. The RRS-SF is a subscale of the Response Styles Questionnaire (RSQ; Nolen-Hoeksema & Morrow, 1991) which assesses an individual's general response style when experiencing feelings of sadness or depression. Participants are asked to rate each item on a 4-point scale ranging from 1 (*Never*) to 4 (*Always*). Items are summed to obtain a total score that ranges from 10 to 40. Higher scores indicate greater use of rumination in response to feelings of sadness and depression. The RRS has an internal consistency of .89 demonstrating a high internal consistency (Nolen-Hoeksema & Morrow 1991). The RRS demonstrates good test-retest reliability where subject responses to the RRS significantly correlated (.62) over a 30-day period (Nolen-Hoeksema et al., 1993). Evidence supports that the RRS has construct validity. When the RRS was compared to the Rumination Sadness Scale there were no differences on mean rumination scores between the two scales (Roelof, Muris, Huibers, Peeter & Arntz, 2006).

Social Problem-Solving Inventory–Revised (SPSI–R). The SPSI–R (D’Zurilla et al., 2002) is a revision of the Social Problem–Solving Inventory (SPSI; D’Zurilla & Nezu, 1990) based on factor analyses of the SPSI (Maydeu–Olivares & D’Zurilla, 1995, 1996). The SPSI–R is a 52–item, self–report instrument that assesses two kinds of problem-solving orientations and three types of problem-solving styles. Participants rate each item on a 5–point scale indicating how much each statement describes their typical problem-solving. The SPSI–R measures all five dimensions of the social problem–solving model, including Positive Problem Orientation (PPO; 5 items),

Negative Problem Orientation (NPO; 10 items), Rational Problem-solving Style (RPS; 25 items), Impulsive–Careless Style (ICS; 10 items), and Avoidance Style (AS; 7 items). Estimates of internal consistency range from .73 to .92 and test–retest coefficients range from .74 to .87 in adult samples (D’Zurilla et al., 2002). In addition, substantial evidence exists supporting the validity of this instrument (D’Zurilla et al., 2002).

Mindful Attention Awareness Scale (MAAS). The MAAS (Brown & Ryan, 2003) is a 15-item self-report questionnaire assessing dispositional mindfulness. Authors of this measure use an indirect approach to tap into mindful-awareness with both negatively and positively worded items to quantify mindfulness (Brown & Ryan, 2003). Participants rate items on a 6-point Likert-type scale. Responses are totaled, with higher scores on the MAAS representing more mindfulness overall. Prior literature has found the MAAS to possess good internal consistency, with Cronbach’s alpha obtained by the developers of the measure being .87 (Brown & Ryan, 2003). Brown & Ryan (2003), also found adequate test-retest reliability for the MAAS ($r=.81$). Evidence for good convergent and discriminant validity has also been found in prior literature (Baer, Smith & Allen, 2004).

Procedure

Data was collected at two separate times; separated by a six week interval. This time interval was chosen to analyze differences in scores over time and measure fluctuations in depressive and anxious scores. Questionnaires were administered in groups of 10-25 people and took approximately one hour to complete. Consent forms were reviewed and collected first followed by the five questionnaires. The questionnaires

were distributed such that the RRS-SF was given first, followed by the MAAS, BAI, BDI-II and the SPSI-R. At T1, participants were asked to sign informed consent forms and complete the questionnaires. At Time 2 (T2), the same participants were asked to complete the same measures again. In order to protect confidentiality, each participant was assigned a number which the Principal Investigator and the Study's Coordinator had access to. All of the data collected during this study was evaluated using the Statistical Package for the Social Sciences (SPSS) version 21 and are reported in the following section.

Chapter 4

Findings

Preliminary analyses were first run to explore whether there were age, gender, or ethnicity, differences within the sample related to rumination, , SPS, mindfulness or depressive and anxious symptoms. A p-value of .01 was utilized for all of the preliminary analyses to control for Type I error. Bivariate correlations were run to determine the relation between age and T1 and T2 total scores on rumination, mindfulness, SPS, depression, and anxiety. Results indicated that there were no significant relationships between age and T1 and T2 total scores. Two separate t-test analyses were run to evaluate gender differences across T1 and T2 total scores and results indicated that there were no significant differences between the groups. A One-Way ANOVA was run to examine differences in ethnicities and T1 and T2 total scores. Results indicated that there were no significant differences between any of the ethnic groups. Due to the non-significant findings for the preliminary analyses, neither age, gender, nor ethnicities were included in the following analyses.

For T1, a total of 113 participants were included (n=113) in the analyses. Descriptive analyses on the study's demographics for T1 revealed age ranging between 18-23 years of age (M= 19.30, SD= 2.32) with more female participants (64%) than male participants (35%). Participant's ethnicities for T1 were as follows; White/Non-Hispanic participants (62%), Black or African American (20%), Asian and White/Hispanic (8%), American Indian or Alaska Native and other (.9%). For T2, a total of 89 participants returned (n=89) which provided a return rate of 78.8% for the current study. Descriptive

analyses on the study's demographics for T2 revealed age ranging between 18-23 years of age ($M= 19.30$, $SD= 2.32$) with more female participants (65.2%) than male participants (33.7%). Participant's ethnicities for T2 were as follows; White/Non-Hispanic participants (58.4%), Black or African American (23.6%), Asian (7.9%), White/Hispanic (9%), and American Indian or Alaska Native and other (1.1%).

Descriptive statistics were run on the five measures for T1 and T2 (BDI-II, BAI, RRS-SF, MAAS, and SPSI-R). Results are presented in Table 1.

Table 1

Descriptive statistics on the BDI-II, BAI, MAAS, RRS-SF, and SPSI-R for Time 1 and Time 2

	N	Mean	SD
BDI-II (T1)	113	12.06	8.33
BDI-II (T2)	89	9.12	7.18
BAI (T1)	113	15.02	10.90
BAI (T2)	89	14.02	12.16
MAAS (T1)	113	4.00	.63
MAAS (T2)	89	4.06	.77
RRS-SF (T1)	113	39.58	11.03
RRS-SF (T2)	89	35.98	9.61
SPSI-R (T1)	113	12.77	3.02
SPSI-R (T2)	89	12.82	2.95

To examine the first hypothesis, bivariate correlations amongst T1 and T2 measures (BDI-II, BAI, RRS-SF, MAAS, and SPSI-R) were run and are presented in Table 2. Similar to previous research findings, T1 and T2 depressive scores on the BDI-II were significantly correlated with scores on the BAI and RRS-SF at T1 and T2. Significant negative correlations were found amongst scores on the MAAS, SPSI-R and the BDI-II (T1 and T2). Similar findings were seen amongst anxious scores on the BAI (T1 and T2) with scores on the BDI-II and RRS-SF at both times and significant negative correlations with scores on the MAAS and SPSI-R (T1 and T2).

Table 2

Correlations between measures at Time 1 and Time 2

	1	2	3	4	5	6	7	8	9	10
1. BDI-II (T1)	-									
2. BDI-II (T2)	.69**	-								
3. BAI (T1)	.51**	.41**	-							
4. BAI (T2)	.36**	.44**	.51**	-						
5. RRS-SF (T1)	.67**	.52**	.43**	.33**	-					
6. RRS-SF (T2)	.54**	.75**	.39**	.45**	.62**	-				
7. MAAS(T1)	-.46**	-.25*	-.34**	-.06	-.36**	-.37**	-			
8. MAAS (T2)	-.36**	-.35**	-.38**	-.27*	-.23*	-.38**	.64**	-		
9. SPSI-R (T1)	-.40**	-.25*	-.38**	-.19	-.34**	-.29**	.62**	.50**	-	
10. SPSI-R (T2)	-.40**	-.34**	-.39**	-.26*	-.32**	-.39**	.58**	.59**	.85**	-

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Note. . Beck Depression Inventory-II; Beck Anxiety Inventory; Ruminative Response Scale-Short Form; Mindfulness Attention and Awareness Scale; Social Problem Solving Inventory-Revised.

* $p < .05$. ** $p < .01$

To examine the second hypothesis; a hierarchical multiple regression analyses was performed to evaluate whether mindfulness, rumination, and SPS would be significant predictors of depressive symptoms at T2, after controlling for the variance predicted by T1 depressive symptoms. For this regression, BDI-II (T1) was entered at the first-step of the equation and RRS-SF, MAAS, and SPSI-R at T1 were entered at the second step of the regression model. BDI-II scores (T2) were entered as the criterion variable of interest. A p value of .01 was used to control for Type I error in both analyses. Results from this analyses found that 48% of the variability predicted in BDI-II (T2) scores was accounted for by scores on the BDI-II (T1), RRS-SF, MAAS, and SPSI-R at T1 ($F [3, 82] = 19.433, p < .682$). The unique variance accounted for by the additional variables entered for the second step of the regression model indicated a R^2 change of 0.9% at a non-significant level ($p < .682$). Results from this analysis are presented in Table 3.

Table 3

Hierarchical linear regression on the predictor variables and depressive criterion variable

Step	Predictor variable	R ²	ΔR ²	F	p
1	T1 BDI-II	.47		77.59	.00**
2	SPSI-R, MAAS, and RRS-SF	.48	.01	19.43	.68

Note: predictor variables include BDI-II scores for Time 1, scores on the SPSI-R, MAAS, and RRS-SF. Criterion variable of interest is BDI-II scores at Time 2.

* $p < .05$. ** $p < .01$

To examine the third hypothesis; a hierarchical multiple regression analyses was performed to evaluate whether mindfulness, rumination, and SPS would be significant predictors of anxious symptoms at T2, after controlling for the variance predicted by anxious symptoms at T1. For this regression, BAI (T1) scores were entered at the first-step of the equation and RRS-SF, MAAS, and SPSI-R at T1 were entered at the second step of the regression model. BAI (T2) scores were entered as the criterion variable of interest. Results from this analyses found that 26% of the variability predicted in BAI (T2) scores was accounted for by scores on the BAI (T1), RRS-SF, MAAS, and SPSI-R at T1 ($F [3, 82] = 8.68, p < .231$). The unique variance accounted for by the additional variables entered for the second step of the regression model indicated a R^2 change of 3.8% at a non-significant level ($p < .231$). Results from this analysis are presented in Table 4.

Table 4

Hierarchical linear regression on the predictor variables and anxious criterion variable

Step	Predictor variable	R ²	ΔR ²	F	p
1	T1 BAI	.26		29.85	.00**
2	SPSI-R, MAAS, and RRS-SF	.29	.03	8.68	.23

Note: predictor variables include BAI scores for Time 1, scores on the SPSI-R, MAAS, and RRS-SF. Criterion variable of interest is BAI scores at Time 2.

* $p < .05$. ** p

Chapter 5

Discussion

The goals of the current study were to explore the following hypotheses.

Hypothesis 1: T1 depressive and anxious symptoms are predicted by T1 mindfulness, rumination, and SPS factors. Hypothesis 2: Mindfulness, rumination, and social problem-solving will predict depressive symptoms after controlling for the variance predicted by Time 1 (T1) depressive symptoms. Hypothesis 3: Mindfulness, rumination, and social problem-solving will predict anxious symptoms after controlling for the variance predicted by T1 anxious symptoms. Based on the bivariate correlations examined, there were significant relationships between mindfulness, rumination, SPS and depressive and anxious symptoms. These results were consistent with those found in previous cross-sectional research studies (Argus & Thompson, 2008; Donaldson & Lam, 2004; Lyubomirsky & Nolen-Hoeksema, 1995; Lyubomirsky et al., 1999) who focused on examining these variables in relation to depression and anxiety. However, the current study examined the ability of these variables to predict depressive and anxious symptoms at T2, while controlling for T1 affect, results found that they did not significantly predict depressive and anxious symptoms. Results from the current study were inconsistent with those found by Hong (2007), who used a prospective design to evaluate overlapping and distinct features of worry and rumination in relation to depression and anxiety in a sample of nonclinical Singaporean college students. Results from Hong's study found rumination to be uniquely related to depressive symptoms and a significant predictor of higher levels of disengagement from problems which led to an exacerbation of depressive symptoms.

In addition, results from the current study also contradicted results found by Miner and Dowd (1996) who evaluated the problem-solving model with the efficacy of three variables (negative life events, current problem, problem-solving) as predictors of depression, anxiety and anger amongst 110 male and 178 female graduate students. Results from this study supported the application of the problem-solving model to the prediction of depressive symptoms. In addition, current problem and problem-solving were found to be related to anxious symptoms prospectively.

Results from the current study found mindfulness, rumination, and SPS to be non-significant predictors of depressive and anxious symptoms over time. Although the bivariate correlations ran indicated significant relationships between mindfulness, rumination, SPS and depressive and anxious symptoms; results from the two hierarchical linear regressions found non-significant results amongst these variables in predicting depressive and anxious symptoms. More specifically, individuals who are effective problem-solvers and have high levels of mindfulness are less likely to endure or report experiencing symptoms of depression and anxiety at T1. While individuals who report high levels of rumination are more likely to experience depressive and anxious symptoms at T1. However, these same characteristics were not found to be true in predicting depressive and anxious symptoms at T2. The results found that although the individuals who reported high levels of mindfulness, low levels of rumination and effective problem-solving characteristics did not significantly predict whether or not these same individuals would endure depression or anxiety at a later time (T2).

The results from the two hierarchical linear regressions were unexpected in that the predictor variables of interest did not statistically predict depression and anxiety over time. It is possible that limitations within the current study may have attributed to these findings. First, the short amount of time in between T1 and T2 data collection may have created practice bias in participant's scores. The practice bias may have altered true responses on the measures used; therefore future researchers should aim to expand this time interval to obtain more variability and accuracy across scores.

A second limitation was that, the current study used a convenience sample of undergraduate college students. This is a limitation because this sample does not reflect true clinical symptoms seen in a clinical sample, therefore severe or moderate levels of depressive or anxious symptoms were not evaluated in the current study. The lack of clinically severe scores may have contributed to the non-significant findings. Future research studies should aim to use a clinical sample to better understand how rumination, mindfulness, and SPS predict negative affect.

A third limitation was that the sample size gathered in the current study was relatively small. By utilizing a smaller sample, the results of the study are limited and are less likely to be generalized to the general population. Having a small sample size may have influenced the insignificance results in the current study. Future researchers should aim to gather more participants in order to evaluate variation amongst scores, symptom severity, and in order to generalize findings to the general populations.

Fourth, data was collected around midterms and finals. During midterms and finals, college students are typically under high levels of stress due to deadlines, exams,

papers, and additional homework assignments. It is possible that stress endured during these time frames may have influenced the study's results. Controlling for additional confounding variables such as stress levels would be ideal for future studies.

A final limitation was that self-reported measures were used in the current study. Data was obtained based on the individual's own perspective of their problem-solving abilities, mindfulness and ruminative characteristics and the study assumed that these individuals had insight on his or her depressive and anxiety symptoms. Such assumptions may be inaccurate because not all individuals have insight into their depressive and anxious symptoms or have an in-depth understanding of their problem-solving abilities, mindfulness and ruminative characteristics. Future studies should attempt to gather responses differently or provide participants with brief summaries of each variable to help participants understanding what these variables are and how they relate to them in their day-to-day lives. Such understandings may help acquire more accurate responses.

In conclusion, it is important to understand how mindfulness, rumination, and SPS predict symptomology over time to help ensure accuracy in treatment development and techniques. In knowing that these variables do not predict depressive and anxious symptoms using a brief, prospective design may alter future research designs and the focus of some of these treatment goals. Treatments such as Mindfulness-Based Cognitive Therapy and Cognitive Behavioral Therapy use mindfulness and problem-solving techniques, individually, to prevent the development of symptomology over time. Although the results found in the current study did not provide significant evidence to

support predictive power, the current study may be utilized as a template for future studies examining SPS, rumination, mindfulness and negative affect.

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Appendix A

Ruminative Response Scale

Instructions: People think and do many different things when they feel depressed. Please read each of the items below and indicate whether you 1-“almost never” 2-“sometimes” 3-“often” or 4-“almost always” think or do each one when you feel down, sad, or depressed. Please indicate what you generally do, not what you think you should do.

1	2	3	4
Almost Never	Sometimes	Often	Almost Always

1. Think about how alone you feel
2. Think “I won’t be able to do my job if I don’t snap out of this”
3. Think about your feelings of fatigue and achiness
4. Think about how hard it is to concentrate
5. Think “What am I doing to deserve this?”
6. Think about how passive and unmotivated you feel
7. Analyze recent events to try to understand why you are depressed
8. Think about how you don’t seem to feel anything anymore
9. Think “Why can’t I get going?”
10. Think “Why do I always react this way?”
11. Go away by yourself and think about why you feel this way
12. Write down what you are thinking about and analyze it
13. Think about a recent situation, wishing it had gone better
14. Think “I won’t be able to concentrate if I keep feeling this way”
15. Think “Why do I have problems other people don’t have?”
16. Think “Why can’t I handle things better?”

17. Think about how sad you feel
18. Think about all your shortcomings, failings, faults, mistakes
19. Think about how you don't feel up to doing anything
20. Analyze your personality to try to understand why you are depressed
21. Go someplace alone to think about your feelings
22. Think about how angry you are with yourself

Appendix B

Mindfulness Attention and Awareness Skills

Instructions: Using the 1-6 scale below, please indicate how frequently or infrequently you currently have each experience. Please answer according to what really reflects your experience rather than what you think your experiences should be. Please treat each item separately from each other item.

1	2	3	4	5	6
Almost Always	Very Frequently	Somewhat Frequently	Somewhat Infrequently	Very Infrequently	Almost Never

1. I could be experiencing some emotion and not be conscious of it until sometime later.
2. I break or spill things because of carelessness, not paying attention, or thinking of something else.
3. I find it difficult to stay focused on what's happening in the present.
4. I tend to walk quickly to get where I'm going without paying attention to what I experience along the way.
5. I tend not to notice feelings of physical tension or discomfort until they really grab my attention.
6. I forget a person's name almost as soon as I've been told it for the first time.
7. It seems I am "running on automatic," without much awareness of what I'm doing.
8. I rush through activities without being really attentive to them.
9. I get so focused on the goal I want to achieve that I lose touch with what I'm doing right now to get there.
10. I do jobs or tasks automatically, without being aware of what I'm doing.

11. I find myself listening to someone with one ear, doing something else at the same time.
12. I drive places on “automatic pilot” and then wonder why I went there.
13. I find myself preoccupied with the future or the past.
14. I find myself doing things without paying attention.
15. I snack without being aware that I’m eating.

Appendix C

Beck Anxiety Inventory

Instructions: Below is a list of common symptoms of anxiety. Please carefully read each item in the list. Indicate how much you have been bothered by each symptom during the **PAST WEEK, INCLUDING TODAY**, by writing the corresponding number on the answer sheet.

0	1	2	3
NOT AT ALL	MILDLY It did not bother me much.	MODERATELY It was very unpleasant, but I could stand it.	SEVERELY I could barely stand it.

- 1 Numbness or tingling.
- 2 Feeling hot.
- 3 Wobbliness in legs.
- 4 Unable to relax.
- 5 Fear of the worst happening.
- 6 Dizzy or lightheaded.
- 7 Heart pounding or racing.
- 8 Unsteady.
- 9 Terrified.
- 10 Nervous.
- 11 Feelings of choking.
- 12 Hands trembling.
- 13 Shaky.
- 14 Fear of losing control.
- 15 Difficulty breathing.
- 16 Fear of dying.
- 17 Scared.
- 18 Indigestion or discomfort in abdomen.
- 19 Faint.

20 Face flushed.

21 Sweating (not due to heat).

Appendix D

Beck Depression Inventory-II

Instructions: This questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick out the **one statement** in each group that best describes the way you have been feeling during the **past two weeks, including today**. Write the number you have picked on the answer sheet. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for any group, including Item 16 (Changes in Sleeping Pattern) or Item 18 (Changes in Appetite).

0	1	2	3
NOT AT ALL	MILDLY It did not bother me much.	MODERATELY It was very unpleasant, but I could stand it.	SEVERELY I could barely stand it.

1. Sadness

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

2. Pessimism

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

3. Past Failure

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

4. Loss of Pleasure

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

3 I can't get any pleasure from the things I used to enjoy.

5. Guilty Feelings

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

6. Punishment Feelings

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

7. Self-Dislike

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

8. Self-Criticalness

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

9. Suicidal Thoughts or Wishes

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

10. Crying

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

11. Agitation

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

12. Loss of Interest

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

13. Indecisiveness

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

14. Worthlessness

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

15. Loss of Energy

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

16. Changes in Sleeping Pattern

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

-
- 1a I sleep somewhat more than usual.
 - 1b I sleep somewhat less than usual.
-
- 2a I sleep a lot more than usual.
 - 2b I sleep a lot less than usual.
-
- 3a I sleep most of the day.
 - 3b I wake up 1-2 hours early and I can’t get back to sleep.

17. Irritability

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

18. Changes in Appetite

- 0 I have not experienced any change in my appetite

- 1a My appetite is somewhat less than usual.
- 1b My appetite is somewhat greater than usual.

- 2a My appetite is much less than before.
- 2b My appetite is much greater than usual.

- 3a I have no appetite at all.
- 3b I crave food all the time.

19. Concentration Difficulty

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

20. Tiredness or Fatigue

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

21. Loss of Interest in Sex

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

Appendix E

The Social Problem Solving Inventory - Revised Long Form

Instructions: This test consists of a list of problems people sometimes have. Read each one carefully and write the number of the response that best describes **HOW MUCH THAT PROBLEM HAS DISTRESSED OR BOTHERED YOU DURING THE PAST 7 DAYS INCLUDING TODAY**. Write only one number for each problem. Do not skip any items.

0	1	2	3	4
Not at all true of me	Slightly true of me	Moderately true of me	Very true of me	Extremely true of me

1. I spend too much time worrying about my problems instead of trying to solve them.
2. I feel threatened and afraid when I have an important problem to solve.
3. When making decisions, I do not evaluate all my options carefully enough.
4. When I have a decision to make, I fail to consider the effects that each option is likely to have on the well-being of other people.
5. When I am trying to solve a problem, I often think of different solutions and then try to combine some of them to make a better solution.
6. I feel nervous and unsure of myself when I have an important decision to make.
7. When my first efforts to solve a problem fail, I know that if I persist and do not give up too easily, I will eventually find a good solution.
8. When I am attempting to solve a problem, I act on the first idea that occurs to me.
9. Whenever I have a problem, I believe that it can be solved.
10. I wait to see if a problem will resolve itself first, before trying to solve it myself.

11. When I have a problem to solve, one of the things I do is analyze the situation and try to identify what obstacles are keeping me from getting what I want.
12. When my first efforts to solve a problem fail, I get very frustrated.
13. When I am faced with a difficult problem, I doubt that I will be able to solve it on my own no matter how hard I try.
14. When a problem occurs in my life, I put off trying to solve it for as long as possible.
15. After carrying out a solution to a problem, I do not take the time to evaluate all of the results carefully.
16. I go out of my way to avoid having to deal with problems in my life.
17. Difficult problems make me very upset.
18. When I have a decision to make, I try to predict the positive and negative consequences of each option.
19. When problems occur in my life, I like to deal with them as soon as possible.
20. When I am attempting to solve a problem, I try to be creative and think of new or original solutions.
21. When I am trying to solve a problem, I go with the first good idea that comes to mind.
22. When I try to think of different possible solutions to a problem, I cannot come up with many ideas.
23. I prefer to avoid thinking about the problems in my life instead of trying to solve them.

24. When making decisions, I consider both the immediate consequences and the long-term consequences of each option.
25. After carrying out my solution to a problem, I analyze what went right and what went wrong.
26. After carrying out my solution to a problem, I examine my feelings and evaluate how much they have changed for the better.
27. Before carrying out my solution to a problem, I practice the solution in order to increase my chances of success.
28. When I am faced with a difficult problem, I believe that I will be able to solve it on my own if I try hard enough.
29. When I have a problem to solve, one of the first things I do is get as many facts about the problem as possible.
30. I put off solving problems until it is too late to do anything about them.
31. I spend more time avoiding problems than solving them.
32. When I am trying to solve a problem, I get so upset that I cannot think clearly.
33. Before I try to solve a problem, I set a specific goal so that I know exactly what I want to accomplish.
34. When I have a decision to make, I do not take the time to consider the pros and cons of each option.
35. When the outcome of my solution to a problem is not satisfactory, I try to find out what went wrong and then I try again.
36. I hate having to solve the problems that occur in life.

37. After carrying out a solution to a problem, I try to evaluate as carefully as possible how much the situation has changed for the better.
38. When I have a problem, I try to see it as a challenge, or opportunity to benefit in some positive way from having the problems.
39. When I am trying to solve a problem, I think of as many options as possible until I cannot come up with any more ideas.
40. When I have decisions to make, I weigh the consequences of each option and compare them against each other.
41. I become depressed and immobilized when I have an important problem to solve.
42. When I am faced with a difficult problem, I go to someone else for help in solving it.
43. When I have a decision to make, I consider the effects that each option is likely to have on my personal feelings.
44. When I have a problem to solve, I examine what factors or circumstances in my environment might be contributing to the problem.
45. When making decisions, I go with my gut feelings without thinking too much about the consequences of each option.
46. When making decisions, I use a systematic method for judging and comparing alternatives.
47. When I am trying to solve a problem, I keep in mind what my goal is at all times.
48. When I am attempting to solve a problem, I approach it from as many different angles as possible.

49. When I am having trouble understanding a problem, I try to get more specific and concrete information about the problem to help clarify it.
50. When my first efforts to solve a problem fail, I get discouraged and depressed.
51. When a solution that I have carried out does not solve my problem satisfactorily, I do not take the time to examine carefully why it did not work.
52. I am too impulsive when it comes to making decisions.