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AN EXAMINATION OF THE RELATIONSHIPS BETWEEN RUMINATION, SOCIAL PROBLEM-SOLVING, MINDFULNESS AND DEPRESSIVE SYMPTOMOLOGY

by
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Thesis Chair: Jim A. Haugh, Ph.D.

Dedication

I would like to dedicate this manuscript to all of my family, friends, and loved ones that

supported me through this process.

Acknowledgments

I would like to recognize Dr. Jim A. Haugh to express my appreciation for all of his

insight, guidance, and support throughout my research career at Rowan University. I

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Abstract

Taylor D. Wiltsee
AN EXAMINATION OF THE RELATIONSHIPS BETWEEN RUMINATION,
SOCIAL PROBLEM-SOLVING, MINDFULNESS AND DEPRESSIVE
SYMPTOMOLOGY
2013/14
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Master of Arts in Math and Science

The present study will examine the relationships between rumination, social problem-solving, mindfulness, and depressive symptomology. These relationships will be evaluated by means of Pearson correlations, and the testing of the proposed path model using AMOS. In order to test our hypotheses, undergraduate students were asked to complete a battery of self-report measures to quantify ruminative tendencies, problem-solving ability, mindfulness skills, and depressive symptom severity and were given course credit for participation. Results indicate that hypotheses were partially supported. Bivariate correlations yielded statistically significant relationships between each of the constructs, with rumination positively associated with depressive symptoms, and negatively associated with social problem-solving and mindfulness. While higher social problem-solving scores were found to be associated with lower rumination and depressive symptoms, and were more likely to possess increased mindfulness ability. Analyses of the path model indicated that rumination and social problem-solving were predictive of depressive symptomology, while the mindfulness path was not found to be predictive of depressive symptoms. Chi-square goodness-of-fit analyses were significant, indicating that the hypothesized model is not an adequate fit for the data.

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Chapter 1

Introduction

Major Depressive Disorder (MDD) is one of the most commonly reported psychological concerns in the United States population (National Institute of Mental Health, 2012). Symptoms of depression go further than depressed mood, and typically include a loss of energy, significant increases or decreases in sleep or appetite, and lack of interest in previously pleasurable activities that can significantly disrupt normal functioning in everyday life (American Psychiatric Association, 1994). Symptoms have not only been found to impact an individual physically, and psychologically, but also socially and financially. In regards to the social costs, it has been found that those closest to a person experiencing symptoms of depression show an overall decrease in psychological well-being, and the quality of those relationships is significantly worsened (Fincham, Beach, Harold, & Osborne, 1997). Economic costs of depressive symptoms have been estimated at approximately $44 billion per year in the United States (Agency for Health Care Policy & Research, 1999). Those experiencing symptoms may vary by degree in regards to symptom severity, and the course of depression. Symptoms can sometimes be more chronic, and relapse or recurrence of symptoms is common (Judd, 1997).

It is important to empirically investigate the way in which depressive symptoms are related to adaptive and maladaptive means of coping with daily life. If the way in which depressive symptoms influences an individual's functioning can be understood, this can potentially foster a better understanding of depressive symptoms, and relapse of symptoms can more directly combatted. The present study focuses on specific constructs

that have been found to be related to depressive symptomology in the previous literature.

Rumination is one construct that has been found to be predictive of the onset, and duration of depressive mood states in undergraduates (Just & Alloy, 1997; Nolen-Hoeksema, Morrow, & Frederickson, 1993). As defined by Nolen-Hoeksema (1991), rumination is "a repetitive and passive way of thinking about current symptoms, as well as the possible causes and consequences of symptoms (pg 570)". The process of rumination involves a focus on negative feelings, as well as thoughts and has been theorized to be a way of coping with distress. According to the Response Styles Theory (RST), ruminative processes focus an individual's attention on negative emotion, so that negative thoughts become more prominent (Nolen-Hoeksema & Larsen, 1999). Rumination has been noted as a core process in depression, and those experiencing both depressive symptomology and rumination experience a cyclical process in which rumination promotes depressed mood, and depressed mood leads to an increased attention to negative thoughts and emotions (Teasdale & Barnard, 1993).

In studying the relationship between depressive mood and rumination a ruminative-state is often induced, and participants are instructed to attend to self-focused thought before psychometric tests are administered to measure negative affect (Nolen-Hoeskema, 1991). In Broderick (2005), the goal was to examine negative mood as it relates to rumination, distraction, and mindfulness. Following mood induction, participants were assigned to rumination, distraction, or mindfulness meditation conditions. The rumination condition was found to have experienced the highest scores on negative affect of all groups after the experimental task was given (Broderick, 2005). When compared to other conditions, rumination in response to negative affect actually

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influenced affect directly to increase negative affective states. Thus ruminating during the experience of negative affective states may exacerbate negative affective states, such as depression, to the extent that symptoms become more severe.

There is much literature to support the idea that ruminating in response to stressors can increase an individual's vulnerability to depressive symptoms. Nolen-Hoeksema and Larsen (1999), for instance, found that when participants ruminate in response to depressed mood they reported more severe, and longer lasting periods of depressed mood when compared to those that engaged in pleasant activities. These ruminative states can become habitual, and engrained into an individual's way of thinking about the world, and themselves. This cognitive frame can remain in place after therapeutic intervention, so that depressive symptoms may remit, but this cognitive framework still remains. When negative mood states occur, they can easily activate the ruminative process. At this point, the risk of depressive relapse or recurrence is increased significantly. Michalak and colleagues (2011) found rumination to be a predictor of the onset of depressive symptoms over the course of treatment and in relation to greater risk of relapse after therapeutic intervention.

Referring back to RST, ruminative processes have also been theorized to impact an individual's ability to affectively solve problems. Rumination interferes so that an individual is not capable of implementing necessary behavioral strategies in order to resolve problems, or generate alternative solutions to the problem itself (Nolen-Hoeksema & Larsen, 1999). The construct of social problem-solving has been found to significantly relate to depressive symptomology as well. It is operationalized within the literature as the "self-directed cognitive-behavioral process by which an individual,

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couple, or group attempts to identify or discover effective solutions for specific problems in everyday living" (D'Zurilla, Nezu, & Maydeau-Olivares, 2002). The "social" aspect of the process refers to problem solving as it naturally occurs in the environment, or in "real world" situations (D'Zurilla & Nezu, 1982).

Social problem-solving includes three elements: the problem itself, problem-solving, and the solution (D'Zurilla, Nezu, & Maydeu-Olivares, 2002). The construct of problem-solving is an active process that can be utilized in an adaptive or maladaptive way. When problem-solving is adaptive, it has been found to be protective against various forms of negative affect. Adaptive problem-solving could be seen as having a positive outlook about the problem, and utilizing the most logical solutions to resolve the problem. When maladaptive problem-solving skills are used, it can serve as a vulnerability to negative affect (D'Zurilla & Nezu, 1982). Maladaptive problem-solving is characterized by having an overall negative outlook about problems, and avoiding problems that may arise.

Several studies have found social problem-solving to be associated with various forms of negative affect, including depression, anxiety, and suicidality in adult populations (Haaga, Fine, Terrill, Stewart, & Beck, 1993; Dixon, Heppner & Rudd, 1994; Haugh, 2006; Nezu, 1987). In the study of social problem-solving as it relates to depression, Dixon and colleagues (1994) found that a bidirectional relationship may exist between depressive symptomology and social problem-solving ability. Indicating that poor problem-solving ability may lead to depressive symptoms and depressive symptoms may lead to decreases in problem-solving ability as a whole. This is evidence for the fact that, like rumination, problem-solving ability can act as a consequence of depression, as

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well as a precursor to its onset.

In accordance with the Response Styles Theory, several studies have found that rumination impedes problem solving ability as well as depressive symptoms. Recurrent thinking, such as rumination, has been conceptualized in the literature as a cognitive means of passively solving previously unresolved problems. It is a self-regulatory mechanism by which an individual believes by ruminating about the previously encountered problem they are attempting to solve them (Martin & Tesser, 1996). This can act to maintain negative affect associated with the problem itself, and halts the behavioral aspect of the problem-solving process. In a study by Watkins & Moulds (2005), those identified as trait ruminators were found to have deficits in problem-solving ability when given a problem-solving task. These findings suggest that there may be an underlying mechanism by which rumination and problem-solving may be predictive of depressive symptomology.

The final construct to be examined in the present study is that of mindfulness. The construct of mindfulness is defined by the literature as "paying attention in a certain way-- on purpose, in the present moment, and nonjudgmentally" (Kabat-Zinn, 1990). The idea of mindfulness is rooted in Eastern ideologies, and has been utilized as an integral part of various forms of psychotherapy for a myriad of health concerns including pain, anxiety, depressive relapse, and patients with terminal illness (Grossman, Niemann, Schmidt, & Walach, 2004; Hofman, Sawyer, Witt, & Oh, 2010). Psychological interventions such as Mindfulness-Based Stress Reduction (MBSR; Kabat-Zinn 2003) by Jon Kabat-Zinn, and Mindfulness-Based Cognitive Therapy (MBCT; Segal, Williams, & Teasdale, 2002) are two examples of effective treatments influenced by values of mindfulness ideologies. In

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MBCT, mindfulness meditation is integrated with cognitive-behavioral ideologies. The 8-week course teaches various mindfulness skills including several breathing space techniques, body scan, and extended meditations to be done daily and foster a new way of living in "being mode" rather than "doing mode" (Segal, Williams, & Teasdale, 2002). MBCT has been empirically validated specifically as a preventative treatment for depressive relapse and recurrence (Segal, Williams, & Teasdale, 2002).

Mindfulness is an adaptive skillset, and has been found to have a negative relationship with measures of negative affect, such as anxiety and depression (Kaviani, Javaheri, & Hatami, 2011). Due to its effectiveness at preventing relapse in those with history of previous Major Depressive Episodes (MDE's; American Psychiatric Association, 1994) most literature focuses on process of mindfulness within those experiencing, or in recovery from depression. In addition to is negative relationship with depression related symptomology, mindfulness has also been found to be negatively related to rumination. Burg & Michalak (2011) examined the relationship between mindfulness, rumination, and depressive symptoms by teaching a mindfulness-based breathing exercise to participants. In this study mindfulness was found to be associated with negative affect, and indicators of negative affect such as rumination, repetitive negative thought, and depressive symptomology. These relationships are negative in nature, in that increased mindful-awareness was found to be associated with lower levels of rumination, negative repetitive thought, and depression decrease. The opposite also holds true, in that those with increased rumination and depressive symptoms were more likely to possess lower levels of mindfulness. These findings lend evidence for the idea that rumination, depressive symptoms, and mindfulness are inter-related. Theoretically

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rumination has been regarded as the antithesis of mindfulness with rumination involving a self-focused processing of information while mindfulness is more experience-based. Studies have found evidence for a negative relationship between these constructs (Sanders & Lam, 2010), and evidence for the idea that mindfulness training may decrease rumination (Michalak, Holz, & Teismann, 2011).

Mindfulness and social problem-solving are considered adaptive skill sets, and potentially vital in warding off negative affect. The Interacting Cognitive Subsystems (ICS) theory suggests that mindfulness' "de-centering", experience-based focus allows for more constructive emotional processing. ICS suggests that by regarding negative emotions and cognitions so that they are events detached from the individual, and experienced rather than explained, problem-solving is more effective and useful (Teasdale & Barnard, 1993; Sanders & Lam, 2010). Furthermore, a person-focused perspective on everyday situations such as rumination is theorized to impede emotional processing. This is also expected to impact problem-solving effectiveness negatively. To date, no studies have looked at the relationship between rumination, social problem-solving, and mindfulness. Despite empirical evidence that suggests their inter-relatedness, no study has examined these constructs and their relation to depressive symptomology. In the present study, rumination, social problem-solving, mindfulness and depressive symptomology will be examined based on these inter-relations, as well as in their ability to predict depressive symptoms.

In order to examine the relationship between each of the constructs, a series of correlation analyses will be run. Based on prior research, it is first hypothesized that statistically significant relationships will exist between constructs on measures of

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rumination, social-problem solving, and mindfulness. Rumination is expected to be significantly negatively associated with social problem solving total scores, and mindfulness total scores. Social problem-solving scores are expected to have a significant and positive relationship with mindfulness scores, and significant negative relationships with measures of rumination. A secondary hypothesis inspects the relationship between each predictor and depressive symptomology. It is expected that social problem-solving and mindfulness total scores will have a significant negative relationship with depressive symptoms. It is also hypothesized that rumination scores will be positively associated with depressive symptoms.

Significant relationships between these constructs will then allow for the testing of the larger model. The third hypothesis involves the testing of a predictive model by means of path analysis. Rumination, social problem-solving, and mindfulness are included as predictor variables, or exogenous variables, while depressive symptoms served as the criterion variable, or the endogenous variable. The path model is depicted in Figure 1.

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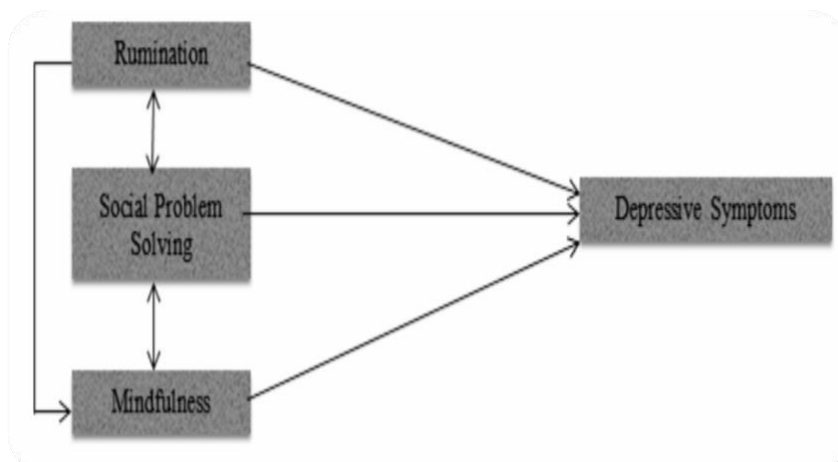
<center>**Chapter 2**</center>

<center>**Method**</center>

2.1 Participants

Approximately 559 students enrolled in introduction to psychology courses took part in the present study. The reported gender of participants was well distributed, with 51 percent of the sample were males, and 46 percent of the sample were female. The majority of participants were White or Non-Hispanic (240, 59%). The age of participants mostly fell between the ages of 18-22 with the majority being 18 (126, 31%). Due to ethical concerns and compliance with the University's Institutional Review Board, no participants under the age of 18 were included in the study. The majority of students that took part in the study were freshmen (191, 47%). Full disclosure of demographic variables are reported in detail in Table 1. No other inclusion or exclusion criteria were utilized for this study.

Variable	Statistic
Gender	
Male	51.0 % (285)
Female	45.8% (256)
Age	M=19.58
Ethnicity	
Caucasian	61.20% (240)
American Indian/Alaskan Native	2.8% (11)
Asian American	4.6% (18)
African American	13.3% (52)
Native Hawaiian/Pacific Islander	1.0% (4)
Hispanic/Latino	14.3% (56)
Academic Rank	
Freshman	51.8% (282)
Sophomore	22.6% (123)
Junior	15.8% (86)
Senior	9.4% (51)
Graduate	4.0% (2)

Table 1: Descriptive Statistics for Demographic Variables

2.2 Measures

Beck Depression Inventory – Second Edition (BDI-II; Beck, Brown, & Steer,

1998). The BDI-II is a 21 item self-report questionnaire of depressive symptoms that the

participants have been experiencing over the past two weeks. Participants are given

instructions to note changes in their behavior over the past two weeks based on a 4-point

scale where a score of 0 indicates no symptoms and a score of 3 indicates severe

symptoms. An example item is a question titled "Sadness", where participants indicate a

0 for "I do not feel sad", a 1 for "I feel sad much of the time", 2 for "I am sad all the

time", or a 3 for "I am so sad or unhappy that I can't stand it". Scores on all items are

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added to obtain a total score that can range from 0 to 63 with higher scores indicating an increase in depressive symptoms. In our sample the BDI-II had an internal consistency of 0.94 demonstrating a high internal consistency. The BDI-II demonstrated high test-retest reliability with a test-retest coefficient of 0.75 that lasts for a period of one-week (Beck et al., 1996). BDI-II scores had a correlation of 0.93 with BDI scores supporting the BDI-II's convergent validity (Dozois, Dobson, & Ahnberg, 1998). Due to the anonymous nature of the present study, the BDI-II was modified by removing the item concerning thoughts of suicide adjusting the range to 0 to 60.

Ruminative Response Scale of the Response Styles Questionnaire (RSS; Nolen-Hoeksema & Morrow, 1991). The RSS is a 22-item self-report measure used to assess ruminative tendencies. The Response Styles Questionnaire quantifies rumination with the RSS, an original scale that measures both rumination and distraction (Nolen-Hoeksema & Morrow, 1991). Items are added to obtain a total score, as well as sub-scores for each of the subcategories of rumination. Within the present study, we utilized only the total score of overall rumination. The RSS has been found to have good internal consistency, with previous Cronbach's alpha reliability coefficients to be approximately .89 (Kingston, Dooley, Bates, Lawlor, & Malone, 2007). Reliability estimates were more than sufficient in the present study, with Cronbach's alpha at .96. RSS scores have also been found to correlate with diary measures of rumination suggesting convergent validity (Nolen-Hoeksema & Morrow, 1991).

Social Problem-Solving Inventory- Revised (SPSI-R; D'Zurilla et al., 2002). The SPSI-R 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, 1996).

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The SPSI-R is a 52- item, self-report instrument that assesses participant's problem solving ability in everyday living. Participants rate each item on a 5-point Likert-type scale indicating how much each statement describes their typical problem solving. Responses are summed for a total score of all items, as well as individual scores within 5 different dimensions of social problem-solving. These 5 subscales of the SPSI-R include 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 are adequate, with Cronbach's alpha's ranging from .73 to .86 (Maydeu-Olivares & D'Zurilla, 1996). In the present study internal consistency of the measure was quite high, with an alpha coefficient of .95. The SPSI-R has also been shown to be highly correlated with other measures of problem-solving, with correlations ranging from .67 to .73 (Chang & D'Zurilla, 1996).

Mindful Attention and Awareness Scale (MAAS; Brown & Ryan, 2003). The MAAS 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. A sample item of the MAAS is "I find it difficult to stay focused on what is happening in the present" (Brown & Ryan, 2003). Participants rate items on a 6-point Likert-type scale with 1 indicating "Almost Always", and 6 indicating "Almost Never". 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

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found adequate test-retest reliability for the MAAS (r=.81). Reliability for our sample exceeded this with an alpha coefficient of .93 indicating high internal consistency. Evidence for good convergent and discriminant validity has also been found in prior literature (Baer et al., 2006).

2.3 Procedure

Students will be recruited from Essentials of Psychology courses and given course credit for their participation using an online experiment management system. After signing up for the study, they will be instructed to click a link taking them to SurveyMonkey.com. They will first be given informed consent which they will then agree to having read and understood. By checking that they have read and understand they agree to participate in the study and are able to move on to complete the study. They are then given an online survey constructed via Survey Monkey containing the BDI-II, MAAS, SPSI-R, and RRS measures. A brief section containing demographic questions was included at the conclusion of the study. The study has been approved by the University's Institutional Review Board prior to being conducted and will be in compliance with the Ethical Standards of the American Psychological Association.

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Chapter 3

Results

3.1 Descriptive Statistics

All outcome measures were examined using the 'Explore' function within SPSS version 21 (SPSS IBM, New York, U.S.A). The total scores for each measure were utilized for each construct in running analyses. Psychometric properties including mean, standard deviation, Cronbach's alpha coefficients, and range of scores for the BDI-II, RRS, SPSI-R, and MAAS are shown in Table 2. Range of scores are described in two ways; first by describing the range of scores possible for each measure given their scoring, while the second lists the actual range of scores found in the present study. Participants reported varying levels of depressive symptomology with some scoring into the severe range of symptoms while others reported no symptoms. Analyses of variance (ANOVA) indicated that significant differences were found in ethnicity and gender in reported depressive symptoms and rumination. Asian Americans reported more depressive symptoms compared to African Americans, $F(1, 6)= 6.14$, $p = .04$, while Native Hawaiian/Pacific Islanders reported more rumination compared to African Americans, $F(1, 6)= 18.52$, $p = .04$, and Caucasians, $F(1,6)= 2.15$, $p = .05$. Women also reported more depressive symptoms compared to men, $F(1, 2)= 2.15$, $p = .01$.

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					Range	
Variable	n	M	SD	α	Potential	Actual
BDI-II	558	5.80	8.22	.94	0-63	0-45
RRS	501	41.40	14.44	.96	22-88	22-82
SPSI-R	526	11.71	2.77	.95	N/A	3.09-19.23
MAAS	399	57.94	16.22	.93	15-90	15-90

Table 2: Psychometric Properties of Study Variables
Note. BDI-II= Beck Depression Inventory—Second Edition; RRS= Ruminative Response Scale; SPSI-R= Social Problem-Solving Inventory- Revised; MAAS= Mindfulness Attention Awareness Scale.

Normality tests were conducted for each of our variables of interest. In examining the results it was found that each of our variables differed significantly from a normal distribution. Shapiro-Wilk tests revealed significant results at the .01 level, indicating that depressive symptoms, rumination, social problem-solving, and mindfulness are not normally distributed within our sample. However, upon examining the Q-Q plots, the predictor variables all appear to stay uniform to the line. The Q-Q plot for depressive symptomology was the only graph that showed significant differences compared to a normal distribution. No transformations were conducted on the data to normalize the sample. All statistics for analyses of normality are listed in Table 3.

	Shapiro-Wilk	
Variable	Statistic	Sig.
BDI-II	.74	.000
RRS	.95	.000
SPSI-R	.98	.000
MAAS	.99	.000

Table 3: Tests of Normality in Study Variables
Note. BDI-II= Beck Depression Inventory—Second Edition; RRS= Ruminative Response

Scale; SPSI-R= Social Problem-Solving Inventory- Revised; MAAS= Mindfulness Attention Awareness Scale

3.2 Inferential Statistics

Pearson correlation analyses were completed to observe the relationships between constructs to test our first hypothesis. Total scores on each of the outcome measures were utilized in these analyses. Bonferoni corrections were utilized in correlation analyses. Rumination was found to have a significant and negative relationship to social problem-solving (r= -.45, p < .01), and mindfulness scores (r= -.39, p < .01). Social problem solving was found to have a significant positive relationship to mindfulness scores (r= .46, p < .01). Pearson correlation analyses were also conducted to determine the relatedness between exogenous variables and the endogenous variable. Rumination was found to be positively correlated with depressive symptoms (r= .51, p < .01), while social problem-solving, and mindfulness total scores were found to be significantly negatively correlated with depressive symptoms (r= -.37, p < .01; r= -.27, p < .01). Results are noted in Table 4.

	1	2	3	4
1. BDI-II	1	---	---	---
2. RRS	.51**	1	---	---
3. SPSI-R	-.37**	-.45**	1	---
4. MAAS	-.27**	-.39**	.46**	1

Table 4: Correlations between Constructs
Note. **Indicates correlation is significant at the .01 level (Two-tailed). BDI-II= Beck Depression Inventory—Second Edition; RRS= Ruminative Response Scale; SPSI-R= Social Problem-Solving Inventory- Revised; MAAS= Mindfulness Attention Awareness Scale.

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In order to test our final hypotheses a path model was constructed including rumination, social problem-solving, and mindfulness as predicting depressive symptomology. Five hundred and fifty nine cases were used in the final path analysis. Due to missing data some total scores were not computed, therefore total N may vary by construct. Rumination, social problem-solving, and mindfulness served as exogenous variables in the model, and depressive symptoms serves as an endogenous variable. Covariance lines were drawn between exogenous variables due to their established relationships. An additional term was added to depressive symptomology as an unobserved factor to control for error within the model.

All estimations were examined using AMOS (Arbuckle & Wothke, 1999). To determine the fitness of the proposed a chi-square goodness-of-fit statistic, χ^2, was used. Acceptable fit is typically associated with a p value of less than .05 or a non-significant chi square value. Therefore, smaller chi-square values combined with a larger p value is relative to better fit of the model to data (Bollen, 1989). Figure 2 conveys results of the path model. Within the model, two variables were found to have significant effect on depressive symptoms: rumination ($\beta = .41$), and social problem-solving ($\beta = -.16$). Values represent the amount of variance contributed by each exogenous variable in regards to our endogenous variable. In the present study, the chi-square statistic ($\chi^2 = .000$) was significant. This suggests that our hypothesized model was not an adequate fit for data collected. See Table 5.
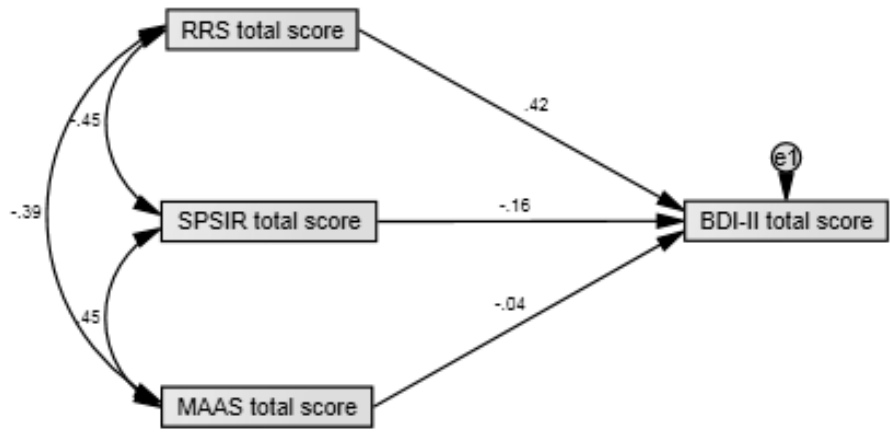
Figure 2: Path Model Output

Path	β	Standard Error	P
RRS→BDI-II	.42	.03	***
SPSI-R→BDI-II	-.16	.14	***
MAAS→BDI-II	-.04	.02	.41

Table 5: Standardized Regression Weights
Note. Minimum was achieved. Chi-square = .000. ***Represents significant path at the .05 level. BDI-II= Beck Depression Inventory—Second Edition; RRS= Ruminative Response Scale; SPSI-R= Social Problem-Solving Inventory- Revised; MAAS= Mindfulness Attention Awareness Scale.

Chapter 4

Discussion

The present study sought to examine the inter-relations between rumination, social problem-solving, mindfulness and depressive symptomology. The first way in which these relationships were examined was by conducting bivariate correlation analyses. In the first hypothesis of the present study it was expected that rumination, social problem-solving, and mindfulness would have significant relationships. Correlation analyses support this hypothesis, in that results indicated statistically significant relationships between each of the variables. Specifically the higher students scored in rumination, the lower they were likely to score in social problem-solving and mindfulness. This directly supports the findings of prior literature that indicates that poor problem-solving ability is associated with rumination, and being taught mindfulness skills is typically related to lower ruminative tendency (Lyubomirsky, Tucker, Caldwell, & Berg, 1999; Burg & Michalak, 2011). An extension of prior literature was also supported within hypotheses regarding the relationship between social problem-solving and mindfulness scores. Findings suggest that increased problem-solving ability is associated with higher mindfulness scores.

Secondary hypotheses were also supported in that each of our constructs was found to be significantly related to depressive symptoms. Correlations indicate that higher levels of rumination are associated with higher frequency of depressive symptoms. While those possessing increased social-problem solving ability were more likely to experience less depressive symptoms. Students that report increased mindfulness skills

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were also found score low on depressive symptoms. The same can be assumed by the inverse; lower levels of rumination indicate a high likelihood of also having low depressive symptoms. While having more depressive symptoms may be indicative of lower scores on measures of social-problem solving, and mindfulness. These findings support our second hypothesis and are in line with previous studies that have examined the relationships between these constructs and depressive symptomology (Nolen-Hoeksema, 1991; Haaga, Fine, Terril, Stewart, & Beck, 1993; Broderick, 2005).

In regards to the third hypothesis, path analysis and Chi-square analyses were utilized to determine the goodness of fit of the constructed model to data collected. Results indicate that both rumination and social-problem solving paths were significant predictors of depressive symptomology. While both rumination and problem-solving were found to effect depressive symptoms, mindfulness was not found to have significant effect in regard to depressive symptoms within our model. Though both rumination and social problem-solving were found to have significant direct effect on depressive symptomology, further conclusions cannot be drawn from this result given that the overall model was found to have a less than adequate fit for the data.

In the present study, the primary goal was to test the fitness of the path model in an attempt to better explain depressive symptomology, and factors that may explain or predict its occurrence. Based on prior literature the model was constructed in order to do just this. However, some limitations do exist related to inherent assumptions within the model. First the theoretical links between the exogenous variables in our model as they are defined in their respective areas of psychological research is vague. Differing descriptions of these constructs, and how they should relate to one another is not always

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clear in the literature. Examining the bivariate correlations of the present study shows the strength and direction of each of these relationships, however, the mechanism under which they operate is not always agreed upon when the three literature bases are compared. An example of this difference can be seen when looking at the idea of problem-solving in the rumination literature. When comparing Nolen-Hoeksema's (1991) definition of problem-solving to that of D'Zurilla and colleagues' (2002) definition of social problem-solving, they appear to be quite similar. Certainly utilization of the findings of previous literature and logical principles may lead us to assume one that is more mindful may be more effective at solving their problems. Upon examining the findings within the present study we see that this is in fact the case. However, there is little empirical evidence to support this relationship. These relationships may exist within the data set of college students in a rural setting, but as is with most constructs studied in social science literature, these constructs are complex in nature, and these findings may not generalize to that of another sample.

A second limitation is that there exist an infinite number of combinations, and factors that can be included within a given path model. The present study presents a model that is just one of several potential models including these constructs. Future studies should investigate the structure of a model including these constructs in order to determine the goodness of fit to one that is simply ordered in a different manner. One example may be to test the inverse of the proposed model within the present study. A model using depressive symptoms as an exogenous variable, with rumination, social problem-solving and mindfulness as endogenous variables may yield a model of better fit to data collected. It also may be interesting to examine direct, as well as indirect effects

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between these constructs within a path analysis framework. Indirect effects in path analysis are observed when a path is created from one construct to another (i.e. Rumination → Depressive Symptoms) with 2 or more arrows and often constructs that may fall along that path and change the effectiveness of that path (i.e. Rumination → Social Problem-Solving → Depressive Symptoms). Utilizing a mediation framework, future studies could examine a model that includes rumination and mindfulness scores as predictors of depressive symptoms, with social problem-solving acting as the mediator. (Beaver, Vaughn, Wright, & DeLisi, 2012; Michl, McLaughlin., Shepherd, & Nolen-Hoeksema, 2013; Abramson et al., 1999; Halvorsen, Wang, Eisemann, & Waterloo, 2010). The theoretical basis linking rumination, social problem-solving, and mindfulness to depressive symptoms may be better explained by the inclusion of another factor that we failed to recognize within the present study.

It may also be important to quantify participant's history of depression related symptomology. Within the present study only symptoms of depression were measured. The responses recorded, and the relationship of our depressive symptoms variable to our other constructs, may be affected by the course of depressive symptoms. For example, a subject scoring in the mild rang of symptoms on the BDI-II may have experienced prior major depressive episodes, or someone with no symptoms may have once met criteria for Major Depressive Disorder.

Methodologically, there also exists a significant limitation in using cross-sectional data within path modeling. By only assessing rumination, social problem-solving, and mindfulness at one time-point it is impossible to infer causation. For future studies it may be important to incorporate a longitudinal design and schedule multiple time points in

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which data is collected. It would be interesting from that point to examine the respecified model including these constructs as latent variables within a structural equation model, and potentially use each time point as variables predicting depressive symptomology. Piggy-backing off of that, future studies may also focus on not only the utilization of separate time-points as latent variables, but other measures of rumination, problem-solving, mindfulness or depressive symptoms. The use of other questionnaire methods, or tasks to demonstrate problem-solving ability or mindfulness skills have been found to be useful in quantifying these constructs and shedding light on their relationship to various forms of negative affect (D'Zurilla & Goldfried, 1971; Broderick, 2005). It has been discussed at length in prior studies, that the utilization of solely self-report data often comes with many disadvantages. Mindfulness measurement by self-report specifically has been noted by Burg & Michalak (2011) to be troublesome in that they have found a discrepancy between reported mindfulness skill and actual mindfulness ability.

Finally, the present study was able to investigate and discover statistically significant relationships between our exogenous variables (rumination, social problem-solving, and mindfulness), and the endogenous variable (depressive symptoms) within a university population. Based on these findings it would be interesting for future studies to examine these relationships in other geographical locations whose sample may be more culturally diverse. It may also be important to replicate the present study with differing populations of college students, such as those from an urban or suburban setting, community colleges, or schools with differing socioeconomic backgrounds in order to test the consistency of these findings. Whether or not these findings would hold true, or differ significantly from those that may be found in a sample of adolescents, older adults,

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or clinical populations would also be interesting data to inspect in the future research.

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