

RUMINATION AND PROBLEM SOLVING: A FOCUS ON DISPOSITIONS,
PROCESSES, AND THE FIVE-STEP FRAMEWORK

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Rumination and Problem Solving: A focus on dispositions, processes, and the five-step framework

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ABSTRACT

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Rumination is a method of responding to and coping with negative moods that involves repetitively and passively focusing on the causes, consequences, and symptoms of negative mood (Nolen-Hoeksema, 1991). Research has indicated that rumination may be an important vulnerability factor for depression. The present study aimed to add to this literature by investigating the deleterious effects that rumination, the process and characteristic trait, has on all five stages of problem solving. The primary hypothesis was that individuals who were high in trait rumination would demonstrate the least effective problem solving performance when induced to ruminate in comparison to when they were induced to distract and in comparison to those low in trait rumination. Overall, the results did not support this hypothesis. The single significant finding was that individuals rated their solutions as less effective when distracting, regardless of trait rumination. This paper critically reviews the literature on the relationship between rumination and problem solving and makes several suggestions for future research.

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INTRODUCTION

Depression is not simply a state of mood, but a negative state of mind that affects behaviors, memories, perceptions, and judgments. According to cognitive theory, this negative state of mind is also a causal antecedent of depression (Beck, 1976; Wenzlaff, 1993). Attempts to identify cognitive precursors to depression have fueled a search for a cognitive vulnerability to depression. One theory that has garnered strong support is the proposal that individuals who respond to negative mood states with a ruminative style are vulnerable to persistent depression (Nolen-Hoeksema, 1987, 1991). The purpose of this study was to explain rumination's role in creating vulnerability for depression from a problem solving perspective. In order to do so, I will explore the relationships among rumination and depression, depression and problem solving, and problem solving and rumination. Finally, the role of cognition and negative emotions in each of these relationships is discussed.

Depression and Rumination

Rumination is a mode of responding to and coping with negative moods that involves repetitively and passively focusing on the causes, consequences, and symptoms of negative mood (Nolen-Hoeksema, 1991). Rumination is considered a passive coping style because the act of thinking about one's situation or symptoms rarely leads to an active attempt to change the situation or symptoms. Instead, it results in a fixation on the problems and feelings (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). The content of this fixation is negative in valence and typically involves thoughts such as: "Why do I feel so bad?", "Where did it all go wrong?", "What is wrong with me?", "How can I go on like this?" (Raes, Hermans, Williams, Bijttebier, & Eelen, 2008).

Some individuals seem more likely to engage in this ruminative response style than others. Evidence from longitudinal studies indicates that rumination appears to be a stable individual characteristic (Davis & Nolen-Hoeksema, 2000; Raes et al., 2008; Sloan, Marx, Epstein, & Dobbs, 2008). In fact, it seems that once the depressed or distressed mood has lifted, the tendency to ruminate does not decrease (Raes et al., 2008).

A number of studies have found a connection between depression and rumination. Sloan et al. (2008) state that rumination increases the risk for depression. Supporting this idea, prospective studies in which participants were assessed for rumination and for depression, through semi-structured diagnostic interviews using DSM-IV diagnostic criteria, at baseline, one-year, and five-year intervals, revealed that rumination predicted the onset of major depression (Nolen-Hoeksema, 2000; Nolen-Hoeksema, Stice, Wade, & Bohon, 2007). Roberts, Gilboa, and Gotlib (1998) also found that rumination precedes, is present during, and follows dysphoria, an experience of negative emotions. Rumination is also highly associated with longer and more severe episodes of depression (Jones, Siegle, & Thase, 2008; Miranda & Nolen-Hoeksema, 2007; Nolen-Hoeksema, 2000).

Rumination is correlated with a variety of maladaptive cognitive processes common in depression, including negative attributional styles, dysfunctional attitudes, hopelessness, pessimism, and self-criticism, even after controlling for depression (Nolen-Hoeksema et al., 2008). Additionally, it has been found that rumination partially or fully mediates the relationship between depression and these cognitive processes (Nolen-Hoeksema et al., 2008). Indeed, it appears that rumination has a unique relationship to depression, a relationship that continues beyond its relationship to these negative cognitive processes once they are statistically controlled (Flett, Madorsky, Hewitt, & Heisel, 2002; Nolen-

Hoeksema, Parker, & Larson, 1994; Spasojevic & Alloy, 2001). In other words, many of the negative cognitive processes that are present in depression may be present due to a depressed individual's tendency to ruminate.

The key characteristic of this relationship seems to concern negative thinking. Rumination is a process of thinking more negatively about the past, but has also been shown to lead depressed individuals to think more negatively about the present and future as well (Nolen-Hoeksema et al., 2008). Individuals who ruminate have also been found to retrieve more negative memories and recall negative events as having occurred more frequently (Lyubomirsky, Caldwell, & Nolen-Hoeksema, 1998). Research has found that ruminators spontaneously talk about troubling problems, are more negative, more self-critical, and express less self-confidence and optimism compared to non-ruminators (Lyubomirsky, Tucker, Caldwell, & Berg, 1999; Nolen-Hoeksema et al., 2008). Finally, ruminators are gloomier in their predictions about the future and have low expectations for positive events, solutions to their problems, or for fun activities (Lyubomirsky & Nolen-Hoeksema, 1995; Lyubomirsky et al., 1999; Lyubomirsky & Nolen-Hoeksema, 1993).

Depression and Problem Solving

Another cognitive approach to understanding depression comes from a problem-solving perspective. *Problem solving* refers to the process by which individuals discover effective means of coping with problematic situations encountered on a day to day basis (D'Zurilla & Nezu, 1982). From this point of view, depression is believed to be triggered by an interaction between stressful events and poor social problem solving (SPS) skills (Nezu, 1987). It is true that research based on this framework supports the theory that depression and SPS skills deficits have an important relationship. Goddard, Dritschel, and

Burton (1996) found that depressed individuals do indeed manifest SPS skills deficits.

McLean (1976) was the first to identify social problem solving deficits as a core feature of depression, but many other researchers have since found that depressed people have difficulties in this area (Beck, 1976; Klerman, 1974; Marx, Williams, & Claridge, 1992). Overall, depressed individuals display more negative, unfavorable attitudes towards their perceived problem solving abilities (Nezu, 1986; Nezu & Ronan, 1985). Nezu (1985; 1986) found that self-ratings of ineffective problem solving abilities and depression are correlated.

Taking this one step further, Marx et al. (1992) discovered that ratings of low self-evaluation of problem solving skills are paralleled by a genuine deficit in problem solving. More specifically, research suggests that depressed individuals become impaired when it comes to the generation of solutions. In Gotlib and Asarnow's study (1979), depressed individuals produced fewer solutions than nondepressed individuals. It has been found that depressed individuals not only generate fewer effective and detailed solutions, but they also show an inability to retrieve formerly successful strategies (Marx et al., 1992). Previous research has suggested that successful social problem solving involves being able to recall a specific instance of previous success in dealing with a problem. Depressed individuals are more likely to recall over-general memories that lack the detail necessary for generating a useful solution based on previous experience (Goddard et al., 1996). In addition, depressed participants have been shown to display difficulties in developing alternatives and producing potential obstacles to overcoming the problem (Marx et al., 1992).

Problem Solving and Rumination

Just as rumination plays an important role in depression's relationship with other cognitive processes, rumination may also be the mechanism responsible for the association between depression and SPS skills deficits. Most problem-solving models commonly consist of five stages: 1) problem orientation (the general response to the situation), 2) problem definition, 3) generation of solutions, 4) decision making, and 5) solution implementation and confirmation of success (D'Zurilla & Goldfried, 1971). There are several reasons why individuals who ruminate may have difficulty solving problems. This section will address how rumination may negatively impact each of these problem solving steps.

Ruminators often report that the reason they engage in rumination is that they are trying to understand and solve their problems (Papageorgiou & Wells, 2001). However, ruminators have been shown to have significantly impaired problem-solving skills, and deficits can be seen at each of the problem-solving stages. At the first stage, problem orientation, ratings of the stability, globality, and internality of causal attributions have revealed dysphoric students who ruminate have more dysfunctional attitudes towards life's problems (Lyubomirsky & Nolen-Hoeksema, 1995). In other words, when faced with a stressful situation, ruminators seem to interpret their problems as unlikely to change (stable), affecting all areas of life (global), and due to personal factors (internal). The problem orientation stage is all about attitude. In order to begin to work towards a solution one must believe that a problem is solvable. When faced with the conclusion that the cause of a problem is stable, one is unlikely to be motivated to solve the problems. In fact,

researchers have found a direct relationship between ruminative thoughts and a reduced willingness to solve problems (Lyubomirsky et al., 1999).

At the second stage of problem solving, problem definition, research has indicated that ruminators appraise their problems as more threatening, more severe, and less controllable (Lyubomirsky et al., 1999). Lyubomirsky et al. also found that ruminators tend to be more self-critical and blame themselves for their problems (e.g., thinking, “I’m lazy” or “I’m unpopular”). This perspective may only convince the individual of the unsolvable nature (e.g., thinking “It’s just the way I am” or “I’ve always been this way and always will be”) and further the lack of motivation towards solving problems.

The third stage of problem solving is the generation of solutions and is perhaps the most widely discussed in research articles of all the stages. Lyubomirsky and Nolen-Hoeksema (1995) looked directly at the relationship between rumination and problem solving capabilities and found that dysphoric students who ruminated generated solutions that were rated significantly lower in global problem-solving effectiveness. Another important component to this finding is that these students also offered a significantly lower percentage of solutions to situations and requested more time to work on developing solutions (Lyubomirsky & Nolen-Hoeksema, 1995; Ward, Lyubomirsky, Sousa, & Nolen-Hoeksema, 2003). In regard to the solutions ruminators do generate, they tend to be judged as less self-satisfying and generated less self-confidence, perhaps because of high levels of uncertainty (Lyubomirsky et al., 1999; Ward et al., 2003).

Individuals who ruminate do indeed appear to be less certain about the effectiveness of the solutions they generate (Ward et al., 2003). This uncertainty may lead an individual to be less likely to commit to one single self-generated solution, the impairment found in

stage four of problem solving, which involves decision making. Therefore, ruminators remain locked in a continued rumination cycle, searching for a correct solution, preventing the individual from actually taking action (Ward et al., 2003).

The final stage of problem solving, solution implementation and confirmation of success, is greatly affected, and is sometimes nonexistent, for those individuals who engage in ruminative response styles. According to Nolen-Hoeksema et al. (2008), even when ruminators generate worthwhile solutions to a problem, rumination seems to impede them from implementing the solutions. In fact, Lyubomirsky et al. (1999) found that students who ruminated showed a greatly reduced likelihood of actually implementing self-generated solutions. Although there are a great number of possible explanations of this behavior, or lack thereof, the most agreed upon explanation is that ruminators lack the efficacy needed to engage in constructive behaviors (Nolen-Hoeksema, 2008). Another explanation could be that if ruminators tend to be gloomier in their predictions about the future and have low expectations for positive events (Lyubomirsky et al., 1998), they will be less motivated and therefore less likely to act.

Even following the rare instance that a solution is implemented, ruminators may lack the ability to modify or adapt the solution to fit changing circumstances. Using the Wisconsin Card Sorting Test, Davis and Nolen-Hoeksema (2000) found that ruminators had a tendency toward cognitive inflexibility. Thus, it is possible that ruminators would be unable to abandon ineffective solutions to their problems.

Purpose and Hypotheses

Studies have shown that there is an important relationship between rumination and problem solving. The issue is not that this relationship exists, but that up to this point,

research has fallen short of thoroughly explaining the link in three important ways. The purpose of this paper is to address and correct for each of these issues. The first major shortcoming in the literature concerns the samples that are being investigated. Virtually all studies in this area of research, including Lyubomirsky and Nolen-Hoeksema (1995) and Lyubomirsky et al. (1999), have relied on dysphoric participants. This type of methodology is problematic because it is impossible to separate the effects of dysphoria on problem solving from those of rumination. The present study will address this issue through the use of a nondysphoric sample of participants.

The second issue is that most studies investigate the link by either inducing the *process* of rumination or measuring the *trait* of rumination instead of utilizing both methods. For instance, Lyubomirsky and Nolen-Hoeksema (1995) and Lyubomirsky et al. (1999) used a manipulation that was designed to induce rumination and distraction in the laboratory. Ward et al. (2003) provide another example of investigating problem-solving deficits that result from rumination. However, they used the trait method, as measured by the Ruminative Response Scale (RRS; Nolen-Hoeksema & Morrow, 1991). It is also possible that there are important differences in the effects of state and trait representations of rumination. It is possible that ruminative response style simply reflects the typical manner in which an individual approaches problems combined with the process of focusing on negative emotions. This study aims to correct this issue by screening participants for high and low trait rumination and inducing the process of rumination in the laboratory.

Finally, the third major problem in today's rumination literature is that most studies have looked at just a single stage of problem solving, the generation of solutions, and do not consider the cumulative effect that rumination may have at each stage. Therefore, the

purpose of this study was to investigate the deleterious effects that rumination and ruminative response style has on all five stages of problem solving in a nondysphoric sample.

First, it was hypothesized that in general, individuals who ruminate will view themselves as having significantly less effective problem solving behaviors and attitudes than individuals who do not ruminate. More importantly, the primary hypothesis of this study was that there is an interaction between the process of ruminating and the disposition, or trait-like tendency to rumination. Individuals who are high in trait rumination were thought to demonstrate the least effective problem solving abilities when induced to ruminate. It was believed that these individuals would rate problems as more global and less solvable, as well as identify more obstacles to solving the problem. In addition, it is likely they would generate fewer definitions of the problem. It was hypothesized the definitions would be rated as more internal (having to do with the self), more general and vague, and more negative in nature. As for developing solutions, these individuals were thought to be likely to generate fewer solutions that they are less confident in and that are rated as less effective, both by the participants themselves and by independent raters. Also, individuals high in trait rumination were hypothesized to be less likely to implement the solutions they generated while undergoing an induction of the process of rumination.

METHOD

Design

This was a two-part study that involves screening participants based on scores from self-report questionnaires. According to the results of these questionnaires, individuals were invited to participate in the lab portion of the study. This second portion of the study involved a within participants design. Each participant underwent a thought manipulation that involved two conditions, a condition intended to induce rumination and a counter-condition designed to induce a non-ruminative state in which participants focused on an aspect other than negative emotion, also known as the distraction condition.

Screening

Participants. Undergraduate students enrolled in North Dakota State University, lower-level psychology classes were invited to participate in a survey. A total of 577 undergraduate students completed the screening portion of this study. These students were recruited through an online, campus research system and received course credit for their involvement in each part of this study.

Measures. The Ruminative Responses Scale (RRS) is a subscale found within the Response Styles Questionnaire (Nolen-Hoeksema & Morrow, 1991). This was used as a measure of an individual's disposition and tendency to ruminate in response to a negative situation and can be found on page 39 of the Appendix. This scale includes 22 items which describe three types of responses to depressed mood: focus on self ("I think back to other times I have been depressed"); focus on symptoms ("I think about how hard it is to concentrate"); focus on possible causes and consequences of the mood state ("I go away by myself and think about why I feel this way"). Individuals respond on a four-point Likert

scale indicating the extent to which each of these items is reflective of themselves. Scores can range from 0 to 66, with higher scores indicating a response style that is more ruminative in nature. The scale has been shown to have an internal consistency of 0.89 and a moderate to high test-retest reliability of 0.47-0.80 (Nolen-Hoeksema & Morrow, 1991).

The Beck Depression Inventory (BDI; Beck, Rush, Shaw and Emery, 1979) is a widely used 21-item measurement of depressive symptoms, refer to page 41 of the Appendix. Respondents indicate the severity of symptoms over the preceding two weeks on a four-point scale. For example, "I do not feel sad" is scored 0 and "I am so sad or unhappy that I can't stand it" is scored a 3. The 21 items are summed in order to obtain a depression score. This score can range from 0 to 63, with scores below 13 considered minimal depression. Rehm (1981) reported reliability of 0.78 and test-retest reliabilities of 0.75 and 0.74 at one and three months consecutively.

The Problem Solving Inventory (PSI; Heppner & Petersen, 1982) is a 32-item self-report measure, which assesses personal problem solving behaviors and attitudes. The scale can be found on page 44 of the Appendix. Just as previous research has done, this study will use this measure to assess ratings of personal problem solving abilities and therefore determine if ruminators view themselves as worse problem solvers. Respondents are asked to indicate the degree to which problem solving behaviors and attitudes are indicative of them on a six-point Likert scale. Scores range from 32 to 192 with higher scores generally indicating better problem solving. Internal consistency has been found to be 0.90 and test-retest reliability at a two-week interval has been established at 0.89 (Heppner & Petersen, 1982).

Procedure. The self-report questionnaires were administered and completed via the computer. Based on responses to these questionnaires, individuals were then contacted via email and offered an opportunity to complete the experiment portion of this study. Participants were chosen based on specific criteria. First, in order to obtain a nondysphoric sample, individuals who scored ten or above on the BDI-II were excluded from the study. It was essential to obtain a nondysphoric sample in order to successfully show the deleterious relationship rumination and problem solving have separate from their individual relationships with depression, a variable that could possibly convolute the results. This cutoff score has been used in previous research studies, is appropriate for disqualifying mildly, moderately, and significantly depressed individuals, and still yields a sufficient number of high ruminators. Second, participants with a score within the top and bottom ranges on the RRS were recruited and invited in to the laboratory to participate in the second portion of the study. According to the upper and lower quartiles of the screening data, a score of twenty or above on the RRS indicated an individual within the “High Ruminator” category and a score of four or below indicated a “Low Ruminator”.

Laboratory Portion

Participants. Forty-four individuals participated in the laboratory portion of the study. Of these individuals, twenty-four were deemed “High Ruminators” and twenty were considered to be “Low Ruminators. Overall, 61.4% were female, 72.7% identified themselves as Caucasian, and 79.5% stated that English was their first language. The age of the participants ranged from 18 to 38 ($M = 20.25$).

Measures. The Problem-Solving Questionnaire (PSQ) was adapted from Nezu’s Problem Solving Scale (Nezu and D’Zurilla, 1979) and can be found in full on page 47 of

the Appendix. Participants were presented with two hypothetical scenarios and asked to imagine the situation as if it were a real problem and to respond “as if you were actually confronted by this problem.” The scenarios concerned roommate conflicts and social situation issues. Participants were then asked to respond to a number of rating scales and free response, open-ended questions. Both the administration and measurement corresponded to the steps involved in the problem solving process. The first step of problem solving, problem orientation, was addressed by asking, “How solvable do you believe this problem is?” and “How likely is this problem to affect other areas of your life?” For each of these questions, participants were asked to respond on a 5-point scale, 1 being not at all solvable and not at all likely and 5 very solvable and very likely. Participants were also asked to list the obstacles they might encounter while solving the problem. Two independent raters counted the number of unique and distinct obstacles listed for each problem. These scores were averaged for a final score of the total number of unique obstacles generated.

The second step of the problem solving process, defining the problem, was addressed by asking participants to think about what the problem is and list as many definitions of the problem as they can think of. This step was assessed through the use of two independent raters. The raters first counted the number of unique and distinct definitions listed for each problem. For each of these unique definitions, these raters then assigned two scores, an internal-external score, rating the internal nature of the definition, and a specific-general score, rating the specificity of the definitions, based on 5-point scale. An internal score would indicate individuals find fault with themselves, for example, “I am too shy to make friends”. While an external score defines the problem as a problem in the

environment, for example, “People don’t seem to like me”. Definitions that are general in nature are those that are vague, incomplete, or broad. Specific definitions are very detailed and perhaps reference aspects of the scenario provided to the participant. These scores were then averaged across each rater and across all problem definitions.

The third step, the generation of solutions, involved participants identifying as many potential solutions as possible. The measurement of this step occurred in multiple steps. First, independent raters counted and totaled the number of unique solutions generated for each problem. These totals were averaged across each problem and across all problems. Second, participants were asked to identify the three solutions for each problem that were believed to be the best options. For each of these solutions, participants indicated on a 5-point scale the degree to which the solution was believed to be effective. These scores were averaged across all three solutions. Finally, independent raters assigned an effectiveness score to each of the three solutions chosen by the participant. These were also based on a 5-point scale and averaged across raters and solutions.

The last two steps in the problem solving process, decision-making and implementation, were addressed by asking participants to identify, using a 5-point scale, how confident they are in their chosen solutions and the likelihood he or she would actually implement the chosen solutions. These scores were averaged across the three best solutions the participant chose.

Finally, independent raters rated the number of negative adjectives used throughout the problem solving process for each problem presented to the participants. Instructions given to the raters can be found on page 54 of the Appendix. Examples of negative

adjectives included but were not limited to: bad, terrible, selfish, stupid, and stubborn.

These two ratings were averaged for an overall negative tone for each problem.

Procedure. At the beginning of the experiment, participants were told they were participating in a study on the “effects that demands on their attention, such as memories, have on their ability to solve problems.” After the experimenter explained the procedure, obtained informed consent, and answered any questions, each subject completed the PSQ under a thought manipulation.

The thought manipulation involved two conditions, and participants completed one hypothetical problem of the PSQ under each condition. Stimuli for the thought manipulation can be found on page 56 of the Appendix. First, experimenters asked participants to “recall a time in your life that was particularly negative or upsetting.” They were prompted to think of a memory that was especially vivid and meaningful to them. Example situations were provided to the participants such as a death in the family, a traumatic event such as a car accident, and the end of a significant relationship. Participants were provided with ample time to recall and choose a memory for the experiment and in order for participants to fully immerse themselves in this memory, the computer provided a series of more detailed prompts, which included aspects of all five senses. These detailed prompts lasted 15 seconds each. The example prompts included, “Where are you, Who is around you, What do you see, What can you hear, What is the temperature like?”

Adapted from Morrow and Nolen-Hoeksema (1990), the rumination condition induced participants to focus their attention on thoughts that were emotion focused, symptom focused, and self focused. For instance, participants were asked to “Remember

the physical sensations in your body at that time,” “Think about what your feelings might have meant,” and to “Think about why you reacted the way you did.” In contrast, the distraction condition induced participants to focus attention on thoughts that were external in nature. Examples of distraction prompts included: “Think about the weather that day,” “Think about your surroundings at the time,” “What buildings, objects, and people are near you?” There was a total of eight prompts in each condition. The duration of each prompt was 15 seconds and all prompts were interspersed throughout the completion of the PSQ problem sets, primarily following each question. All conditions and PSQ problem sets were randomly assigned and counterbalanced, so that there were four possible combinations. The experiment started with either problem one or problem two, each paired with either the distraction condition or the rumination condition.

Manipulation Checks. In order to ensure both the thought manipulation and research design were effective and adequate, three types of manipulation checks were used. These checks are described here but can also be found in the Appendix on page 57. The first type of check was primarily used as a way to measure the participants’ states of rumination. It involved asking six questions from the RRS twice, once following each thought manipulation. Since the questions were from the RRS, the same scale and wording was used. However, instead of asking participants about their responses over the past few weeks, they were asked to rate the rumination questions according to their experiences at that time. Each set of scores was then summed separately for two rumination scores, one to indicate rumination while induced to ruminate and one to indicate rumination while induced to distract.

The second check was a measure of affect and arousal. Participants were asked to indicate the levels of affect and arousal that they were experiencing at that moment. These ratings were according to a 9-point scale, 1 indicating none at all and 9 indicating the highest level, and they were taken twice, each time following a thought manipulation.

The third and final type of check was used in order to ensure the research design was satisfactory and doing what it was designed and intended to do. This involved asking participants a set of four questions upon the completion of the experiment. These questions concerned how intense the negative memory they were asked to recall throughout the experiment was for them, the extent to which the memory was vivid, and the difficulty keeping the memory in mind while solving the problems. Each of these three questions were rated on a 5-point scale, for example 1 indicated low intensity/vividness/concentration difficulties and 5 was high intensity/vividness/concentration difficulties. The last question asked participants what they believed to be the purpose of this study. This was done to assess whether the participants were aware of the hypothesized differences in response to the two conditions, rumination and distraction. If participants were aware, the mixed nature of the design would have been changed to a between-subjects design. However, participants seemed unaware of the primary reason for the manipulation.

Summary. It was hypothesized that there would be an interaction between the process of ruminating and the trait of rumination. Specifically, it was thought that individuals high in trait rumination would demonstrate the least effective problem solving when induced to ruminate. In order to investigate this, scores from the dependent variables were entered into separate 2 (Rumination Group: Low vs. High) X 2 (Condition: Rumination vs. Distraction) mixed design analyses of variance. Unless otherwise noted, all

analyses had an N of 44, 24 of which were in the high ruminator group and 20 in the low ruminator group.

RESULTS

Reliability Analyses

The first important aspect of this study to note is that many of the analyses and results relied on ratings given by independent raters. Each of two judges scored responses on 7 items of the PSQ for each of the two conditions. These items are listed in the methods section and include the number of unique definitions, obstacles, and solutions, as well as the internal nature and specificity of the definitions, the number of negative adjectives used, and the overall effectiveness of the solutions. These raters scored these responses from a total of 44 participants. Statistical examination of these ratings indicated that they were reliable. The correlations of the scores given by the independent raters range from $r = .76 - 1.00$ ($M = .95, p = .00$). Not only were the ratings significantly correlated, the absolute mean differences between the ratings was very small, ranging from $.00-.26$ ($M = .14$). Finally, the intraclass correlations, a measure of reliability of ratings and agreement between raters, ranged from $.67-1.00$ ($M = .94, p = .00$). The full table of analyses of the reliability of these raters can be seen in the appendix (Tables 10.1 and 10.2; p. 58). As a consequence, the reliability of these ratings is acceptable.

Primary Analyses

Pearson correlation coefficients were calculated between the self-report measures and demographic variables. Data from the screening portion of the study are presented in Table 1.1 and data from the laboratory portion are presented below in Table 1.2. For both samples, there were significant correlations between the BDI and RRS scores ($r = .76, p = .00$; $r = .67, p = .00$) and between the BDI and PSI scores ($r = -.37, p = .00$; $r = -.38, p = .01$). In the lab portion of the study, PSI scores were also significantly correlated with the

age of the participants ($r = .30, p = .05$). As for the hypothesis of this study, there was only a significant correlation between the RRS and PSI, rumination and perceived problem solving abilities, in the screening portion of the study ($r = -.31^{**}$).

Table 1.1

Summary of Correlational Analyses: Screening Portion

Measure	<i>M</i>	<i>SD</i>	1	2	3
1. RRS	14.94	10.84	—		
2. BDI	6.32	7.13	.76**	—	
3. PSI	128.09	15.11	-.31**	-.37**	—

Table 1.2

Summary of Correlational Analyses: Laboratory Portion

Measure	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7
1. RRS	14.91	11.89	—						
2. BDI	2.75	3.20	.65**	—					
3. PSI	130.73	16.46	-.14	-.38*	—				
4. Sex	1.39	.49	.10	-.23	.28	—			
5. Age	20.25	3.50	-.07	-.09	.30*	.16	—		

$N = 44$

* Correlation is significant at the 0.05 level

**Correlation is significant at the 0.01 level

Descriptive statistics can also be seen in the above tables. As for the RRS, the mean score in the screening portion was 14.94 ($N = 469, SD = 10.84$) and 14.91 ($N = 44,$

$SD = 11.89$) in the lab portion. The mean score on the BDI in the screening was 6.32 ($N = 469$, $SD = 7.13$) and 2.75 ($N = 44$, $SD = 3.20$) in the laboratory portion after screening out scores of 10 or higher. Finally, the PSI mean scores were 128.09 ($N = 469$, $SD = 15.11$) in the screening and 130.73 ($N = 44$, $SD = 16.46$) in the lab.

At the first stage of problem solving, orientation, there were no significant main effects or interactions for thoughts of the global nature of the problem, beliefs about solvability of the problem, or number of unique obstacles listed. Below is a table of means for the variables in this stage of problem solving. All F statistics were less than 1.0.

Table 2

Means (SD) for Global Nature, Solvability, and Unique Obstacles by Group and Condition

Variable	Rumination Group	Condition	
		Rumination	Distraction
Global Nature	Low	3.55 (.76)	3.50 (1.05)
	High	3.50 (1.22)	3.58 (.97)
Solvability	Low	3.60 (.82)	3.60 (.82)
	High	3.46 (.88)	3.42 (.77)
Unique Obstacles	Low	1.95 (1.40)	1.80 (1.24)
	High	2.37 (.87)	2.15 (1.10)

In the second stage of problem solving, defining the problem, the variables included average number of unique definitions generated, internal/external nature of the definitions,

and specific/general nature of the definitions. The means and standard deviations from these variables are presented in Table 3. There were no significant main effects or interactions on any of the stage 2 variables, including the number of definitions, all p s > .20, and specificity, all F s < 1.0.

Table 3

Means (SD) for Unique Definitions, and Internal/External and Specific/General Nature of Definitions by Group and Condition

Variable	Rumination Group	Condition	
		Rumination	Distraction
Unique Definitions	Low	1.15 (1.46)	1.15 (1.18)
	High	1.60 (1.24)	1.69 (1.50)
Internal/External	Low	2.76 (1.07)	2.73 (1.33)
	High	2.58 (1.34)	2.32 (1.08)
Specific/General	Low	2.94 (.82)	3.12 (1.08)
	High	3.09 (1.00)	3.09 (1.03)

The third step in the problem solving process involved solutions and the average effectiveness, both self reported (SR) and independent rated (IR), of those solutions. These data are presented in Table 4. When considering the number of unique solutions generated, there were no significant main effects for condition, $F(1, 42) = .93, p = .34$ or group, $F(1, 42) = 2.07, p = .16$, or interaction between condition and group, $F(1, 42) = .003, p = .96$.

There were also no significant main effects or interactions when considering IR effectiveness of these solutions since all F statistics were less than 1.0. On the SR effectiveness of solutions there was a significant main effect of condition with the rumination condition yielding higher effectiveness scores, $F(1, 42) = 8.61, p = .005$. However, there was no main effect for group, $F(1, 42) = 1.44, p = .24$, or interaction between group and condition, $F(1, 42) = .15, p = .70$.

Table 4

Means (SD) for Unique Solutions and Effectiveness by Group and Condition

Variable	Rumination Group	Condition	
		Rumination	Distraction
Unique Solutions	Low	2.78 (1.15)	2.50 (1.40)
	High	3.25 (1.75)	3.00 (1.32)
IR Effectiveness	Low	3.12 (.92)	3.20 (.71)
	High	3.11 (.83)	3.19 (.49)
SR Effectiveness	Low	3.77 (.59)	3.54 (.52)
	High	3.88 (.79)	3.31 (.76)

The fourth and fifth stages involve the variables of confidence in and the likelihood of implementation of the solutions. The means and standard deviations are listed in Table 5. On confidence, there were no significant effects, all $ps > .20$. Second, as for how likely

the participant was to implement the solutions they generated, there were also no significant effects, all $ps > .18$.

Table 5

Means (SD) for Confidence and Implementation by Group and Condition

Variable	Rumination Group	Condition	
		Rumination	Distraction
Confidence	Low	3.46 (.69)	3.18 (.70)
	High	3.24 (1.07)	3.12 (.82)
Implementation	Low	3.60 (.90)	3.41 (.84)
	High	3.80 (.83)	3.58 (.78)

Finally, the overall negative adjectives used by participants when solving the problems were analyzed. Means and standard deviations are presented in Table 6. There were no significant main effects or interactions for group and condition, all F statistics were less than 1.0.

Table 6

Means (SD) for Negative Adjectives by Group and Condition

Variable	Rumination Group	Condition	
		Rumination	Distraction
Neg Adjectives	Low	1.55 (1.75)	1.73 (1.85)
	High	1.83 (1.27)	1.98 (2.08)

Secondary Analyses

Multiple manipulation and conditions checks were done throughout the experiment. These, listed in the methods section, include measurements of rumination, affect, arousal, intensity of the memory, vividness of the memory, difficulty keeping the memory in mind, and one question regarding the purpose of the study. First, in terms of levels of rumination there was a significant main effect of group, $F(1, 42) = 6.60, p = .01$. However, there was no main effect of condition or interaction of condition by group since the F statistics were less than 1.0. Refer to Table 7 and 8 for details.

Table 7

Means (SD) for Levels of Rumination by Group and Condition

Variable	Rumination Group	Condition	
		Rumination	Distraction
Rumination	Low	11.05 (4.06)	11.05 (3.82)
	High	13.63 (3.74)	14.00 (3.89)

As for ratings of arousal, there were no significant main effects for condition, $F(1, 42) = 2.98, p = .09$, or group, $F(1, 42) = .23, p = .64$, and no significant interaction, $F(1, 42) = .28, p = .60$. In terms of affect, there were no significant main effects or interactions since the F statistics were less than 1.0.

The manipulation checks, intensity, vividness, and concentration, were analyzed using a one-way ANOVA (Variable by Group) and details can be seen in Table 9. There was no significance considering all F statistics were less than 1.0. Finally, answers to the open-

ended question regarding the purpose of the study were analyzed and were found to be sufficiently incorrect and therefore it was determined the mixed design was useful.

Table 8

Means (SD) for Arousal and Affect by Group and Condition

Variable	Rumination Group	Condition	
		Rumination	Distraction
Arousal	Low	3.80 (1.64)	4.00 (1.75)
	High	3.46 (2.02)	3.83 (1.90)
Affect	Low	4.70 (1.66)	4.55 (1.76)
	High	4.62 (1.77)	4.38 (1.53)

Table 9

Means (SD) for Intensity, Vividness, and Concentration by Group and Condition

Variable	Rumination Group	
	Low	High
Intensity	3.95 (1.05)	4.17 (.92)
Vividness	3.85 (.75)	4.04 (.75)
Concentration	3.60 (.99)	3.50 (.89)

In summary, it was hypothesized that there would be an interaction between the process of ruminating and the trait of rumination at each step of the problem solving process. Specifically, it was thought that individuals who are high in trait rumination would demonstrate the least effective problem solving abilities when induced to ruminate. In order to investigate this hypothesis, scores from the dependent variables were entered into separate 2 (Rumination Group: Low vs. High) X 2 (Condition: Rumination vs. Distraction) mixed design analyses of variance. Results indicate that independent raters were reliable, self-report measures were correlated, and that regardless of group, individuals rated their solutions as more effective when induced to distract.

DISCUSSION

Rumination is a method of responding to and coping with negative moods that involves repetitively and passively focusing on the causes, consequences, and symptoms of negative mood (Nolen-Hoeksema, 1991). Some research has indicated that rumination is an important vulnerability factor for depression. For example, several studies, including prospective and longitudinal research, have shown that individuals who exhibit ruminative response styles, are more likely to experience depression, likely to be more depressed, and likely to be depressed for longer when faced with a stressful event (Jones, Siegle, & Thase, 2008; Nolen-Hoeksema, 2000; Nolen-Hoeksema, Stice, Wade, & Bohon, 2007; Miranda & Nolen-Hoeksema, 2007). One approach to understanding this vulnerability comes from a problem-solving perspective. A potential mechanism by which rumination leads to depression is by its influence on problem solving, possibly at each of the five stages common in problem solving models. It has been found that rumination is correlated with dysfunctional attitudes towards problem solving, a reduced willingness to solve problems, an appraisal of problems as more threatening, internal, and severe, the generation of fewer, less effective solutions, less confidence in the solutions, and a reduced willingness to implement solutions (Lyubomirsky & Nolen-Hoeksema, 1995; Lyubomirsky et al., 1999; Ward, Lyubomirsky, Sousa, & Nolen-Hoeksema, 2003). This research, however, has fallen short of successfully explaining this connection. Most studies examining the relationship between rumination and problem solving have been correlational in nature and typically involve dysphoric participants (Lyubomirsky & Nolen-Hoeksema, 1995; Lyubomirsky et al., 1999; Ward, Lyubomirsky, Sousa, & Nolen-Hoeksema, 2003). Thus, the causal influence rumination has on problem solving performance is unknown and

confounded with the likely influence of depressive symptoms. The present study aimed to correct these shortcomings by investigating the deleterious effects of rumination, both the process of ruminating and the characteristic trait, on all five stages of problem solving in a nondysphoric sample.

The interaction between a ruminative coping style and the process of ruminating about a negative event was studied with a mixed design, between groups and within groups, analyses. The primary hypothesis was that individuals who were high in trait rumination would demonstrate the least effective problem solving performance at each of the five problem solving steps, when induced to ruminate. The results did not support this hypothesis. The single significant finding concerned the third stage of problem solving and self-reported effectiveness. It was found that individuals rated their solutions as less effective when induced to distract, regardless of whether the individual was a high or low ruminator. This finding does not fit with previous research or my model of rumination and problem solving and should be further investigated before assumed reliable. Apart from this finding, there were no other significant main effects or interactions at any stage of problem solving.

There are four possible explanations for the lack of significant findings. First the results indicate that affect and arousal did not change between conditions. A memory of the same negative event was used for both conditions. This means that an individual participant should have recalled the same kind of emotion in both conditions. While, it had been thought that ruminating (the process of focusing on internal emotional states) might heighten this emotion, clearly this did not happen. Ruminators reported higher levels of rumination during the experiment than low ruminators, but did not differ in their level of

rumination across conditions. These results are important for two reasons. First, it may be that affect and arousal matters a greater deal more than this study assumed. It is possible that the design of this study was not effective at eliciting the emotional responses necessary to imitate the affect and arousal that rumination naturally provokes in real life situations. Alternatively, it may be possible that holding the negative event constant made it difficult for ruminators to change the way they thought about the event. In addition, it may not have been a strong enough manipulation to vary the problem solving responses of the participants. Future studies would be aided by including a neutral event as well as a negative event.

The second possible limitation to the study and explanation for the lack of findings concerns observed power of the analyses. Power of all the analyses ranged from .002 - .818 ($M = .134$). More importantly, the power of the analyses that produced insignificant effects ranged from .002 - .258 ($M = .099$). For the most part, power was less than the generally considered acceptable power level of .80, therefore, it is unreasonable to assume that these results are sufficient enough to be conclusive. Assuming the manipulation was reasonable, in order to correct this limitation, future research should aim to increase the number of participants in the study.

The third possible explanation for the lack of significant findings could be the sensitivity of the measures used. It may be that the measures created in our version of the PSQ are not sensitive enough to pick up on subtle differences between groups and conditions. This is an aspect of the design that future research should address.

Finally, it could be that the lack of effects was not due to a weak manipulation or an insufficient number of participants. This study was designed because while looking at the

connection between rumination and problem solving, previous research seemed to confound depression with rumination (Lyubomirsky & Nolen-Hoeksema, 1995; Lyubomirsky et al., 1999; Ward, Lyubomirsky, Sousa, & Nolen-Hoeksema, 2003). This study attempted to separate the two constructs and look entirely at the concept of rumination. It is entirely possible that the effects were due to the fact that the real cause of the previously found associations is NOT rumination, but the presence of dysphoria or depression. This could especially be true since many researchers have found that depressed individuals manifest poor problem solving performance, show ineffective problem solving skills, and display more negative, unfavorable attitudes towards problem solving (Beck, 1976; Burton, 1996; Klerman, 1974; Marx, Williams, & Claridge, 1992; McLean, 1976; Nezu, 1986).

It could also be possible that it is in fact a combination of dysphoria and rumination that produces the problem solving differences. For example, Lyubomirsky et al. (1999) found a direct link between rumination and reduced problem solving performance when looking specifically at dysphoric individuals. It may be neither alone, but the combination of the two that is important.

On a similar note, it could be possible that by screening out depressed individuals, the highest ruminators were being screened out and the sample of “high” ruminators was being limited. In fact, the average rumination score of the high ruminators invited into the lab was 24.98 ($N = 24$). When including all individuals in the screening portion of the study, the average rumination score increased to 29.7 ($N = 124$). Scores on the 22-item scale have a possible range of 0 – 66. In addition, when not screening out for depression, previous research has found mean scores of 33.8 ($N = 13$) for currently dysphoric, 26.1 ($N = 13$) for

previously dysphoric, and 11.0 ($N = 19$) for never dysphoric individuals (Roberts et al., 1998).

In summary, it was hypothesized that the disposition and process of rumination about a negative event would result in poorer problem solving performance. This was not found to be true. Methodological problems, including the lack of differentiation of levels of rumination across conditions and the limited range of rumination scores, could be responsible for the lack of differences observed. This study was indeed unique in that it attempted to isolate rumination from dysphoria. However, it is possible that it is not rumination, but rather dysphoria or the combination of dysphoria and rumination that is important to problem solving performance.

Despite the general lack of findings, this study has numerous strengths and provides several important contributions to the current literature. First, this is the first study of rumination and problem solving that investigates the relationship using a 2x2 mixed design. This design allowed for a specific focus on two aspects of rumination, the dispositional, trait-like tendency to ruminate and the actual process of engaging in rumination. In addition, the study was designed in a way that utilized the 5-step framework of problem solving and is the first to include all five steps in a single study. Finally, although it is possibly implicated in several explanations of the lack of findings, the screening out of depressed individuals was an important aspect of this study. Following future research, it has possibilities of helping to either separate the influence of depression and rumination on problem solving or implicate the two processes together in a combination that effects problem solving.

This study has the potential to have important implications in the area of not only rumination research, but depression research as well. If future research is able to address and correct the multiple limitations of this study, significant findings could be used to both explain a possible vulnerability factor for depression and make a significant contribution to the intervention literature. For example, it could be used to add to the theoretical explanations behind the effectiveness of interpersonal and cognitive and behavioral therapies that address goal-directed behavior and problem solving abilities.

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APPENDIX

Ruminative Responses Scale

Instructions: People think and do many things when they feel depressed. Please read each of the items below and indicate whether you never, sometimes, often, or 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.

Almost Never	Sometimes	Often	Almost Always	Item
				Think about how alone you feel
				Think "I won't be able to do my job/work because I feel so badly"
				Think about your feelings of fatigue and achiness
				Think about how hard it is to concentrate
				Think about how passive and unmotivated you feel
				Analyze recent events to try to understand why you are depressed
				Think about how you don't seem to feel anything anymore
				Think "Why can't I get going?"
				Think "Why do I always react this way?"
				Go away by yourself and think about why you feel this way
				Write down what you are thinking about and analyze it
				Think about a recent situation, wish it had gone better
				Think "Why do I have problems other people don't have?"
				Think about how sad you feel
				Think about all your shortcomings, failings, faults, mistakes
				Think about how you don't feel up to doing anything
				Analyze your personality to try to understand why you are depressed
				Go someplace alone to think about your

				feelings
				Think about how angry you are with yourself
				Listen to sad music
				Isolate yourself and think about the reasons why you feel sad
				Try to understand yourself by focusing on your depressed feelings

Scoring:

A total score is found by summing all of the responses according to the following scale:

Almost Never = 0

Sometimes = 1

Often = 2

Almost Always = 3

A higher score indicates a response style that is more ruminative in nature.

Beck Depression Inventory

Instructions: On this questionnaire are groups of statements. Please read each group of statements carefully. Then pick out the statement in each group which best describes the way you have been feeling this PAST WEEK, INCLUDING TODAY! Circle the number beside the statement that you picked. If several statements in the group seem to apply equally well, circle each one. Be sure to read all the statements in each group before making your choice.

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

2. 0 I am not particularly discouraged about the future.
 1 I feel discouraged about the future.
 2 I feel I have nothing to look forward to.
 3 I feel that the future is hopeless and that things cannot improve.

3. 0 I do not feel like a failure.
 1 I feel I have failed more than the average person.
 2 As I look back on my life, all I can see is a lot of failures.
 3 I feel I am a complete failure as a person.

4. 0 I get as much satisfaction out of things as I used to.
 1 I don't enjoy things the way I used to.
 2 I don't get real satisfaction out of anything anymore.
 3 I am dissatisfied or bored with everything.

5. 0 I don't feel particularly guilty.
 1 I feel guilty a good part of the time.
 2 I feel quite guilty most of the time.
 3 I feel guilty all of the time.

6. 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. 0 I don't feel disappointed in myself.
 1 I am disappointed in myself.
 2 I am disgusted with myself.
 3 I hate myself.

8. 0 I don't feel I am any worse than anybody else.
1 I am critical of myself for my weaknesses or mistakes.
2 I blame myself all the time for my faults.
3 I blame myself for everything bad that happens.
10. 0 I don't cry anymore than usual.
1 I cry more now than I used to.
2 I cry all the time now.
3 I used to be able to cry, but now I can't even though I want to.
11. 0 I am no more irritated now than I ever am.
1 I get annoyed or irritated more easily than I used to.
2 I feel irritated all the time now.
3 I don't get irritated at all by the things that used to irritate me.
12. 0 I have not lost interest in other people.
1 I am less interested in other people than I used to be.
2 I have lost my interest in other people.
3 I have lost all of my interest in other other people.
13. 0 I make decisions about as well as I ever could.
1 I put off making decisions more than I used to.
2 I have greater difficulty in making decisions than before.
3 I can't make decisions any more.
14. 0 I don't feel I look any worse than I used to.
1 I am worried that I am looking old or unattractive.
2 I feel that there are permanent changes in my appearance that make me unattractive.
3 I believe that I look ugly.
15. 0 I can work about as well as before.
1 It takes an extra effort to get started at doing something.
2 I have to push myself very hard to do anything.
3 I can't do any work at all.
16. 0 I can sleep as well as usual.
1 I don't sleep as well as I used to.
2 I wake up 1-2 hours earlier than usual and find it hard to get back to sleep.
3 I wake up several hours earlier than I used to and cannot get back to sleep.
17. 0 I don't get more tired than usual.
1 I get tired more easily than I used to.
2 I get tired from doing almost anything.
3 I am too tired to do anything.

18. 0 My appetite is no worse than usual.
1 My appetite is not as good as it used to be.
2 My appetite is much worse now.
3 I have no appetite at all anymore.
19. 0 I haven't lost much weight, if any, lately.
1 I have lost more than 5 pounds.
2 I have lost more than 10 pounds.
3 I have lost more than 15 pounds.
20. 0 I am no more worried about my health than usual.
1 I am worried about physical problems such as aches and pains; or upset stomach; or constipation.
2 I am very worried about my physical problems and it's hard to think of much else.
3 I am so worried about my physical problems that I cannot think about anything else.
21. 0 I have not noticed any recent changes 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.

Scoring:

A total score is found by summing all of the responses. A higher score indicates the experience of more depression symptoms.

Problem Solving Inventory

Instructions: Read EACH of the following statements carefully and decide to what degree each statement is or is not characteristic of you. For each of the statements, show your answer by placing the number from the provided scale that BEST DESCRIBES YOU in the blank in front of each statement. Be sure to choose only one answer for each statement. Because people are different there is no right answer or wrong answer to these statements. To decide whether a given statement is typical of your way of looking at things, simply keep in mind what you are like MOST OF THE TIME.

1	2	3	4	5	6
Never	Rarely	Seldom	Sometimes	Often	Always
True	True	True	True	True	True

1. _____ When a solution to a problem is unsuccessful, I do not examine why it didn't work.
2. _____ When I am confronted with a complex problem, I do not bother to develop a strategy to collect information so I can define exactly what the problem is.
3. _____ When my first efforts to solve a problem fail, I become uneasy about my ability to handle the situation.
4. _____ After I have solved a problem, I do not analyze what went right or what went wrong.
5. _____ I am usually able to think up creative and effective alternatives to solve a problem.
6. _____ After I have tried to solve a problem with a certain course of action, I take time and compare the actual outcome to what I thought should have happened.
7. _____ When I have a problem, I think up as many possible ways to handle it as I can until I can't come up with any more ideas.
8. _____ When confronted with a problem, I consistently examine my feelings to find out what is going on in a problem situation.
9. _____ I have the ability to solve most problems even though initially no solution is immediately apparent.
10. _____ Many problems I face are too complex for me to solve.
11. _____ I make decisions and am happy with them later.

12. _____ When confronted with a problem, I tend to do the first thing that I can think of to solve it.
13. _____ Sometimes I do not stop and take time to deal with my problems, but just kind of muddle ahead.
14. _____ When deciding on an idea or possible solution to a problem, I do not take time to consider the chances of each alternative being successful.
15. _____ When confronted with a problem, I stop and think about it before deciding on a next step.
16. _____ I generally go with the first good idea that comes to my mind.
17. _____ When making a decision, I weigh the consequences of each alternative and compare them against each other.
18. _____ When I make plans to solve a problem, I am almost certain that I can make them work.
19. _____ I try to predict the overall result of carrying out a particular course of action.
20. _____ When I try to think up possible solutions to a problem, I do not come up with very many alternatives.
21. _____ Given enough time and effort, I believe I can solve most problems that confront me.
22. _____ When faced with a novel situation I have confidence that I can handle problems that may arise.
23. _____ Even though I work on a problem, sometimes I feel like I am groping or wandering, and am not getting down to the real issue.
24. _____ I make snap judgments and later regret them.
25. _____ I trust my ability to solve new and difficult problems.
26. _____ I have a systematic method for comparing alternatives and making decisions.
27. _____ When confronted with a problem, I do not usually examine what sort of external things my environment may be contributing to my problem.
28. _____ When I am confused by a problem, one of the first things I do is survey the situation and consider all the relevant pieces of information.

29. _____ Sometimes I get so charged up emotionally that I am unable to consider many ways of dealing with my problems.
30. _____ After making a decision, the outcome I expected usually matches the actual outcome.
31. _____ When confronted with a problem, I am unsure of whether I can handle the situation.
32. _____ When I become aware of a problem, one of the first things I do is try to find out exactly what the problem is.

Scoring:

The following items are reverse scored: 1, 2, 3, 4, 10, 12, 13, 14, 16, 20, 23, 24, 27, 29, 31. A total score is then found by summing all of the responses and subscale scores are found by summing the corresponding items. A lower score indicates a lower perceived problem solving ability.

Subscales –

Problem-solving confidence: 5, 10, 11, 12, 19, 23, 24, 27, 33, 34, 35

Approach avoidance style: 1, 2, 4, 6, 7, 8, 13, 15, 16, 17, 18, 20, 21, 28, 30, 31

Personal control: 3, 14, 25, 26, 32

Problem Solving Questionnaire

Instructions: Please read the following situations carefully and refer to it to answer the following questions. Try to think of the situation as being a real problem for you, and think about how you would respond to it as if you were actually confronted by this problem.

PROBLEM 1: For as long as you can remember, you have felt nervous and uncomfortable when meeting people for the first time, especially members of the opposite sex. Because you prefer to avoid such feelings, you have tended to be reluctant to date and enter into new social situations. When you first started to come to NDSU, you hoped that a new change of scene might help and that there would be more opportunities to make friends. After a few weeks at NDSU, a friend invites you to a party and wants to introduce you to a real nice guy/girl. You have previously seen this person in your psychology class and you remember thinking it would be nice to get to know him/her. Therefore, you would really like to meet this guy/girl, but are hesitant about accepting because you know that you will be very nervous at the time, and might possibly make a bad impression by appearing awkward and tense.

Choose one number for each question that best describes your beliefs and opinions regarding the situation above.

1. How solvable do you believe this problem is? _____

1	2	3	4	5
Not at all solvable	Difficult to solve	Somewhat solvable	Solvable	Very solvable

2. How likely is this problem to affect other areas of your life? _____

1	2	3	4	5
Not at all likely	Somewhat unlikely	Neutral	Somewhat likely	Very likely

3. In this situation, there are many different ways of defining this problem. What do you think the problem is? How would you describe this problem? List as many definitions of the problem as you can think of, at least three.

4. In this situation, there may be many obstacles or difficulties which would interfere with being able to solve this problem. List as many of these obstacles or difficulties as you can think of.

5. Identify as many potential solutions as you can think of for this problem, regardless of how effective or appropriate you may think they are.
6. Of the solutions you listed for question 4, rank the order of three solutions you believe to be the best option for solving this problem. Identify and state these solutions below according to the rank associated with them. Following each solution, please respond to a set of questions regarding your attitudes towards that solution.

Best Solution:

How effective do you believe this solution is? _____

1	2	3	4	5
Not at all effective	ineffective	Somewhat effective	Effective	Very effective

How confident are you that this solution will have positive results? _____

1	2	3	4	5
Not at all Confident	Somewhat confident	Moderately confident	Confident	Very confident

Imagine that this problem has happened to you, how likely are you to actually implement this solution? _____

1	2	3	4	5
Not at all likely	Unlikely	Somewhat likely	Likely	Very likely

Second Best Solution:

How effective do you believe this solution is? _____

1	2	3	4	5
Not at all effective	ineffective	Somewhat effective	Effective	Very effective

How confident are you that this solution will have positive results? _____

1	2	3	4	5
Not at all Confident	Somewhat confident	Moderately confident	Confident	Very confident

Imagine that this problem has happened to you, how likely are you to actually implement this solution? _____

1	2	3	4	5
Not at all likely	Unlikely	Somewhat likely	Likely	Very likely

Third Best Solution:

How effective do you believe this solution is? _____

1	2	3	4	5
Not at all effective	ineffective	Somewhat effective	Effective	Very effective

How confident are you that this solution will have positive results? _____

1	2	3	4	5
Not at all Confident	Somewhat confident	Moderately confident	Confident	Very confident

Imagine that this problem has happened to you, how likely are you to actually implement this solution? _____

1	2	3	4	5
Not at all likely	Unlikely	Somewhat likely	Likely	Very likely

PROBLEM 2:

You are currently living on the halls in one of the residential dormitories on campus. You don't have any close friends on the hall, since most of your friends live in other dorms, yet you seem to get along with your hallmates. It is 11:00 p.m. on a Tuesday night and your room is crowded with people socializing. The group consists of your roommate and several friends who live on the hall. You are not close with your roommate, but you have been getting along fairly well and would like to keep it that way. You would like to go to sleep since you have an exam in your early class. However, your roommate and his/her friends show no sign of leaving. In fact it seems there are more people joining. Also, you had quietly asked them to leave an hour ago.

Choose one number for each question that best describes your beliefs and opinions regarding the situation above.

1. How solvable do you believe this problem is? _____

1	2	3	4	5
Not at all solvable	Difficult to solve	Somewhat solvable	Solvable	Very solvable

2. How likely is this problem to affect other areas of your life? _____

1	2	3	4	5
Not at all likely	Somewhat unlikely	Neutral	Somewhat likely	Very likely

3. In this situation, there are many different ways of defining this problem. What do you think the problem is? How would you describe this problem? List as many definitions of the problem as you can think of, at least three.

4. In this situation, there may be many obstacles or difficulties which would interfere with being able to solve this problem. List as many of these obstacles or difficulties as you can think of.

5. Identify as many potential solutions as you can think of for this problem, regardless of how effective or appropriate you may think they are.

6. Of the solutions you listed for question 4, rank the order of three solutions you believe to be the best option for solving this problem. Identify and state

these solutions below according to the rank associated with them. Following each solution, please respond to a set of questions regarding your attitudes towards that solution.

Best Solution:

How effective do you believe this solution is? _____

1	2	3	4	5
Not at all effective	ineffective	Somewhat effective	Effective	Very effective

How confident are you that this solution will have positive results? _____

1	2	3	4	5
Not at all Confident	Somewhat confident	Moderately confident	Confident	Very confident

Imagine that this problem has happened to you, how likely are you to actually implement this solution? _____

1	2	3	4	5
Not at all likely	Unlikely	Somewhat likely	Likely	Very likely

Second Best Solution:

How effective do you believe this solution is? _____

1	2	3	4	5
Not at all effective	ineffective	Somewhat effective	Effective	Very effective

How confident are you that this solution will have positive results? _____

1	2	3	4	5
Not at all Confident	Somewhat confident	Moderately confident	Confident	Very confident

Imagine that this problem has happened to you, how likely are you to actually implement this solution? _____

1	2	3	4	5
Not at all likely	Unlikely	Somewhat likely	Likely	Very likely

Third Best Solution:

How effective do you believe this solution is? _____

1	2	3	4	5
Not at all effective	ineffective	Somewhat effective	Effective	Very effective

How confident are you that this solution will have positive results? _____

1	2	3	4	5
Not at all Confident	Somewhat confident	Moderately confident	Confident	Very confident

Imagine that this problem has happened to you, how likely are you to actually implement this solution? _____

1	2	3	4	5
Not at all likely	Unlikely	Somewhat likely	Likely	Very likely

Scoring:

Scoring will be based on the problem solving steps.

STEP 1: Problem Orientation

- *Solvability and globality will be scored by averaging the four solvability scores.*
- *Three independent raters will count the number of unique obstacles listed for each problem. These three totals will be averaged for a score of the total number of unique obstacles generated.*

STEP 2: Problem Definition

- *Three independent raters will assign each definition listed an internal-external score on a 1 to 5 scale (1 being internal and 5 being external). These scores will then be averaged across each problem and across all problems for a total internal-external score.*
- *Three independent raters will assign each definition listed a specific-general score on a 1 to 5 scale (1 being very specific and 5 being very general), These scores will then be averaged across each problem and across all problems for a total specific-general score.*
- *Three independent raters will count the number of negative adjectives used in each problem definition. These totals will be averaged for a total score of negative tone.*
- *Three independent raters will count the number of unique definitions listed for each problem. These three totals will be averaged for a score of the total number of unique definitions generated.*

STEP 3: Generation of Solutions

- *Three independent raters will count the number of unique solutions listed for each problem. These three totals will be averaged for a score of the total number of unique solutions generated.*

STEP 4: Decision Making

- *Self-rated scores of effectiveness and confidence will be provided by the subjects for each individual solution and will also be averaged across all solutions and problems for total scores of self-rated effectiveness and confidence.*
- *Three independent raters will assign each solution listed an effectiveness score on a 1 to 5 scale (1 being very ineffective and 5 being very effective), These scores will then be averaged across each solution, across each problem, and across all problems for a total effectiveness score.*

STEP 5: Commitment & Implementation

- *Self-rated scores of likelihood of implementation will be provided by the subjects and averaged across each solution, across each problem, and across all problems for a total score.*

Scoring Instructions for Independent Raters

- Count the number of unique obstacles listed for each problem. When counting, include only obstacles that are sufficiently distinct from other obstacles listed.
- Assign each definition listed an internal-external score based on the following scale. An internal score indicates the individual defines the problem as a problem with themselves, that the environment plays no role. On the other hand, an external score indicates the individual believes the problem is a problem with the environment, with no internal causes.

1	2	3	4	5
Very Internal	Somewhat Internal	Neutral	Somewhat External	Very External

- Assign each definition listed a specific-general score on the following scale. A specific definition is one that defines the problem in a precise and detailed manner. On the other hand, a general definition is one that defines the problem in a more universal and broad manner.

1	2	3	4	5
Very Specific	Somewhat Specific	Neutral	Somewhat General	Very General

- Go through each definition and count the number of negative adjectives the subject used. Examples of negative adjectives include but are not limited to: bad, terrible, stupid, selfish, ugly.
- Count the number of unique definitions listed for each problem. When counting, include only definitions that are sufficiently distinct from other definitions listed.
- Assign each solution listed a score of effectiveness using the following scale. An effective solution is one that will address the definition of the problem, result in positive

consequences, lead to the generation of more solutions, or will ultimately solve the problem.

1	2	3	4	5
Very Ineffective	Somewhat Ineffective	Neutral	Somewhat Effective	Very Effective

7. Count the number of unique solutions listed for each problem. When counting, include only solutions that are sufficiently distinct from other solutions listed.

Thought Manipulation Task Stimuli

Memory Prompts:

- “Try to imagine you are back there, what is happening?”
- “When is it happening?”
- “How old were you?”
- “Where are you?”
- “Close your eyes for a moment and recall any smells that are around you.”
- “What do you see?”
- “What can you hear?”
- “What is the temperature like there? Hot? Warm? Cold?”
- “Were other people involved?”
- “Try to place yourself in the memory throughout the rest of the study. I’ll ask you details about the memory throughout the time to help you along the way.”

Rumination Condition:

- “Why did you react the way you did?”
- “Think about the way you felt inside.”
- “Think about how tired you felt.”
- “Try to understand why you felt the way you did.”
- “Think about what these feelings might have meant.”
- “Think about how similar/different you were compared to other people.”
- “Think about how sad you felt.”
- “Think about how hopeless you felt.”

Distraction Condition:

- “Think about the weather that day. Is it raining? Snowing? Sunny?”
- “Think about your surroundings at the time.”
- “Think about if any people are around you.”
- “Think about what you were wearing.”
- “Think about what season it was. Fall, winter, spring, summer?”
- “Think about how long the event lasted.”
- “Think about other things that happened that day.”
- “Think about what time of day it was.”

Manipulation Check Questions

Rumination Checks (from the RRS):

“While trying to solve this problem, how often did you...

1. ...Think about how you don't feel up to doing anything”
2. ...Think about how passive and unmotivated you feel”
3. ...Think about how hard it is to concentrate”
4. ...Think about how alone you feel”
5. ...Think about all your shortcomings, failings, faults, mistakes”
6. ...Think about how angry you are with yourself”

Scoring:

A total score is found by summing all six of the responses according to the following scale:

Almost Never = 0

Sometimes = 1

Often = 2

Almost Always = 3

A higher score indicates a response style that is more ruminative in nature.

Manipulation Checks:

“During this study, you were asked to recall a personal experience that was unpleasant...

1. ...How would you rate this memory in terms of intensity? In other words how upsetting or emotional was this memory?”
2. ...How vividly were you able to imagine or recall the event?”
3. ...To what extent were you able to keep that memory in mind while solving the problems?”
4. In a few words, please describe what you believe we expect to find in this study? In other words, what do you believe our hypothesis is?

Table 10.1

Independent Rater Reliability: Rumination Condition

Rating	Correlation	Absolute Difference	Intraclass Correlation
# of Unique Definitions	.994**	.0227	.994**
# of Unique Obstacles	1.000**	.0000	1.000**
# of Unique Solutions	.995**	.0227	.995**
Internal Nature of Definitions	.969**	-.0436	.966**
Specificity of Definitions	.872**	-.0473	.873**
# of Negative Adjectives Used	.991**	-.0455	.990**
Effectiveness of Solutions	.905**	.2557	.845**

** Correlation is significant at the 0.01 level

Table 10.2

Independent Rater Reliability: Distraction Condition

Rating	Correlation	Absolute Difference	Intraclass Correlation
# of Unique Definitions	.994**	.0227	.994**
# of Unique Obstacles	.992**	-.0227	.992**
# of Unique Solutions	1.000**	.0000	1.000**
Internal Nature of Definitions	.943**	.0114	.939**
Specificity of Definitions	.907**	-.2235	.882**
# of Negative Adjectives Used	.988**	.0000	.988**
Effectiveness of Solutions	.760**	.2837	.666**

** Correlation is significant at the 0.01 level