

Examining the Relation Between Academic Rumination and Achievement Goal Orientation

by

Martin Van Boekel
B.Sc., University of Toronto, 2001
B.Ed., Lakehead University, 2003

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Supervisory Committee

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Abstract

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The current study investigated the relation between academic rumination and achievement goal orientation using hierarchical regression. One hundred and ninety-six first year undergraduate students completed measures of depressive symptoms (BDI), achievement goal orientation (PALS) and rumination (MDRS). Analysis revealed that participants adopting performance-avoid goals were more likely to engage in brooding and reflective ruminative responses to stressful academic situations, while those reporting adopting mastery goal orientations were more likely to report lower brooding scores in stressful academic situations. Further analysis revealed that the relation between academic rumination and achievement goal orientation extended beyond a shared relationship with depressive symptoms. These findings are a first step in demonstrating a relationship between academic rumination and achievement goal orientations which may help to improve motivational intervention programs that assist students in adopting mastery goals as well as coping with stressful academic situations.

Table of Contents

Supervisory Committee	ii
Abstract	iii
Table of Contents	iv
List of Tables	vii
Acknowledgements	viii
Chapter I – Introduction	1
Background to the Study	1
Overview of Study	2
Chapter II – Review of Selected Literature	4
Rumination	4
Response Styles Theory	5
Goal Progress Theory	7
Measuring Rumination	8
Operationalizing Rumination	11
Achievement Goal Orientation	11
Goal Orientation and Rumination	13
Research Questions	15
Chapter III – Methodology and Research Design	17
Population and Sample	17
Measures	17
Multi-Domain Rumination Scale (MDRS)	17

The Patterns of Adaptive Learning Survey (PALS)	20
The Beck Depression Inventory (BDI)	21
Procedure	22
Chapter IV – Results	23
Preliminary Data Analyses	23
Treatment of outliers	23
Gender and university entry year differences	23
Ethnicity	24
Descriptive data	24
Main Analyses	26
Overview	26
Regression of PALS goal orientations and gender onto rumination	27
Brooding	27
Reflection	28
Regression of PALS goal orientations and gender onto depressive symptoms (BDI)	29
Regression of brooding, reflection and BDI onto PALS goal orientation subscales	30
Mastery Orientation	31
Performance-approach	31
Performance-avoid	32
Chapter V - Discussion	33
Primary Research Question	33

Limitations and Future Research	38
Conclusion	40
References	42
APPENDIX A: Multi-Domain Rumination Scale (MDRS)	55
APPENDIX B: Regression Analysis: Gender and University Enrolment Session	58

List of Tables

Table 1. Mean Scores for BDI, Rumination and Motivation Orientation Subscales

Table 2. Correlation Matrix

Table 3. Hierarchical Multiple Regression Analyses Predicting Brooding From PALS subscales and Gender

Table 4. Hierarchical Multiple Regression Analyses Predicting Reflection From PALS subscales and Gender

Table 5. Hierarchical Multiple Regression Analyses Predicting Depressive Affect From PALS subscales and Gender.

Table 6. Hierarchical Multiple Regression Analyses Predicting Mastery Goal Orientation From BDI and MDRS Subscales

Table 7. Hierarchical Multiple Regression Analyses Predicting Performance-Approach Goal Orientation From BDI and MDRS Subscales

Table 8. Hierarchical Multiple Regression Analyses Predicting Performance-Avoid Goal Orientation From BDI and MDRS Subscales

Table 9. Factor Loadings and Communalities (Comm) for Brooding and Reflection Subscales of Academic and Social MDRS - Final Nine Items

Table 10. Hierarchical Multiple Regression Analyses Predicting Academic Brooding From Gender and Cohort (Fall or Spring enrolment) and two-way interactions

Table 11. Hierarchical Multiple Regression Analyses Predicting Academic Reflection From Gender and Cohort (Fall or Spring enrolment) and two-way interactions

Table 12. *Hierarchical Multiple Regression Analyses Predicting Depressive Symptoms (BDI) From Gender and Cohort (Fall or Spring enrolment) and two-way interactions*

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Chapter I - Introduction

Background to the Study

Over the past few decades, two fields in Psychology--rumination and achievement goal orientation--have been widely studied. Surprisingly, little research has examined the relation between these two fields¹. Research exploring the associations between these two constructs is of importance because efforts to encourage “better” goal orientations in an academic situation may be undermined in stressful or failure situations as a result of rumination.

In general terms, the process of rumination can be thought of as repetitively and uncontrollably thinking about a negative event. However, researchers disagree on the context and causes of ruminative thoughts (Smith & Alloy, 2009). Smith and Alloy propose a definition that unifies many of the different conceptualisations of rumination. They define rumination as “experientially avoidant emotion regulation strategy that arises in response to perceived discrepancies between desired and actual status” (Smith & Alloy, 2009; p. 126). This definition incorporates themes from two of the dominant theories of rumination: response styles theory (Nolen-Hoeksema, 1991) and goal attainment theory (Martin & Tesser, 1996).

Achievement goal orientation is a field in motivation that explores why people engage and persist in tasks. Within education this area of study is of particular importance because the goals a student adopts will impact how they approach their learning (Covington, 2000). Students may choose to adopt mastery goals, in which they engage in a learning activity to develop greater competence or skills (Dweck & Elliot, 1983). Students may also gravitate towards performance-approach goals, in doing so they engage in a task in order to demonstrate

¹ In April 2011 the PsychInfo database yield on a keyword search of ‘rumination’ was 2019 publications. Similarly, the yield on a keyword search of (‘goal orientation’ OR ‘achievement orientation’) was 2489 publications. In stark contrast, the yield from a search combining both ‘rumination’ and (‘goal orientation’ OR ‘achievement orientation’) as keywords returned only eight publications.

competence (Elliot & Harackiewicz, 1996). While others may adopt a performance-avoid goal orientation in order to avoid an academic task that may result in displays of incompetence (Elliot & Harackiewicz, 1996). Students may orientate themselves toward one style of goal in one situation while maintaining different goal orientations in another². Additionally, learning and performing environments and demands can be adjusted to induce situation specific mastery or performance orientations in students (Dweck, 2002; Elliot & Dweck, 1988).

Identifying a relation between achievement goal orientation and academic rumination may result in improved motivational intervention programs that not only encourage mastery goals, but help participants to develop strategies to cope with stressful situations that may induce ruminative responses.

To set up a productive discussion of the relation between rumination and achievement goal orientations, I will first examine them independently. The study of rumination requires particular attention as there is less consensus regarding definitions and corresponding measurement tools. To begin, I will outline the pertinent theoretical models and measurements of rumination, which will form the basis for the operationalization of the definition of rumination used in this study. Next, I will review the current motivational research and theory on achievement goal orientation. Shared theoretical and empirical findings between achievement goal orientation and rumination will be discussed, illuminating a reason for the exploration of the links between these two constructs.

Overview of the Study

To investigate the relation between academic rumination and achievement goal orientation I will be conducting three sets of analyses. The first is comprised of two different

² While research indicates that people may poses more than one goal orientation simultaneously (Barron & Harackiewicz, 2001) this article focuses on a student's tendency to gravitate towards mastery, performance-approach or performance-avoid goals.

hierarchical regressions using the achievement goal orientations (mastery, performance-approach and performance-avoid) to predict each rumination subscale (brooding and reflection). The second hierarchical regression uses the same model to predict depressive symptoms. The third set of hierarchical regressions examines the relation between achievement goal orientations and rumination after accounting for each constructs' shared relationship with depressive affect. Each achievement goal orientation subscale will be predicted independently by depressive symptomology followed by the rumination subscales.

When an individual chooses to adopt a performance-avoid goal orientation in an academic setting it is likely that they will experience failure because they have withdrawn effort in order to protect themselves from displays of incompetence. If, in that same subject, they continue to hold a performance-avoid orientation, continued failure may result in depressive affect which may lead to ruminative thoughts surrounding those failures and the emotions that accompanies them. Therefore, it is expected that a measures of academic rumination such as the Multi-Domain Rumination Scale (MDRS) will be positively related with a measures of performance-avoid goal orientation using the Patterns of Adaptive Learning Scale (PALS). In contrast, a student who adopts a mastery goal orientation, as measured by the PALS, chooses to participate in academic tasks because they see intrinsic value in the challenge that task brings. This positive view of the challenging academic task may buffer against both depressive symptomology and ruminative thoughts, meaning it is expected that those who report a tendency to adopt mastery goals would also report lower instances of rumination in academic situations.

Chapter II – Review of Selected Literature

Rumination

Rumination³ is a construct associated with the onset and persistence of depression.

While rumination has been the focus of many studies over the past two decades there is yet to be a unified definition (Smith & Alloy, 2009). Models of rumination vary in their conceptualization; these include repetitive thoughts about past failures focusing on the negative affect and consequences of the distress (Nolen-Hoeksema, 1991), repetitive negative thoughts focusing on gaps in actual and desired states (Wells & Matthews, 1994), and repetitive thoughts focused on failed goal progress (Martin & Tesser, 1996) (for a complete review see Smith & Alloy, 2009). Two pertinent models of rumination explored in this study are: Nolen-Hoeksema's (1991) response styles theory and Martin and Tesser's (1996) goal progress theory.

Papageorgiou and Wells (2004) suggest that understanding the differences and similarities between rumination and various cognitive constructs will help fine-tune the study of rumination. While several cognitive processes have been discussed in relation with rumination, two constructs have received more attention than others: negative automatic thoughts and worry. Papageorgiou and Wells (2001) propose that the primary difference between negative automatic thoughts and rumination is the duration. Negative automatic thoughts can be regarded as a brief reflection on the loss or failure, whereas rumination is repetitive thinking about the event, spanning an indefinite period of time.

³ Rumination, as conceptualized in this article, is different than that of several popular dictionaries. Collins English Dictionary (2009) defines rumination as “to mediate or ponder”, and the Merriam-Webster's Medical Dictionary (2007) as “to engage in contemplation”. While these share similarities with the definitions applied in psychology, they fail to include details about the content or reasons behind the ruminating. The definitions listed here represent elements of rumination similar to that reported in the section on “Goal Progress Theory”.

Researchers have also pointed to temporal differences between rumination and worry. Worry is seen as future oriented thought about events that have not yet happened (Borkovec, Robinson, Pruzinsky, & Depree, 1983), whereas rumination is primarily characterized by past-oriented thoughts (Papageorgiou & Wells, 1999). Nolen-Hoeksema and colleagues (2008) state that one further difference between the two constructs is that when people worry they are unsure of the event to come, but maintain the belief that the event can be controlled; whereas ruminators are more certain of the event, however they do not believe the events that follow the stressful situation will be controllable. The relationship between rumination and worry has been documented in research, linking high levels of rumination to more worrying and depressive symptoms than low ruminators (Giorgio et al, 2010). Both constructs are significantly correlated (Watkins, 2004; Watkins, Moulds, & MacIntosh, 2005) but factor analyses have found that these two constructs are two separate factors (Fresco et al., 2002; Watkins, Moulds & Macintosh, 2005; Segerstrom, Tsao, Alden, & Craske, 2000). Furthermore, both rumination and worry display similar deleterious consequences such as: inadequate solution implementation and poor problem solving (Lyubomirsky et al., 1999; Ward, Lyubomirsky, Sousa, & Nolen-Hoeksema, 2003; Watkins & Baracaia, 2002).

Response Styles Theory. According to the response styles theory (Nolen-Hoeksema, 1991) rumination involves responding to a negative event through repetitive thinking about the causes and the consequences of the event. When ruminating, persons are not engaging in active problem solving; rather, they remain focused on the negative event, dwelling on the problem and the negative affect uncontrollably with an absence of strategy for dealing with the event.

The following scenario illustrates a ruminative response to an academic failure according to the response styles theory:

Jane, a first year university student, received a failing grade on her first university assignment. Jane subsequently has uncontrollable, recursive thoughts about her depressive symptoms, why she has failed, and what the consequences of failing will be. Rather than developing an active solution to dealing with the poor assignment Jane remains passive, focusing on the failure and her feelings.

Jane's ruminative response may lead to various negative repercussions.

Research applying the response styles theory of rumination has examined rumination as a risk factor in the development and persistence of depression. (Alloy, Abramson, Hogan, Whitehouse, Rose, Robinson, Kim, & Lapkin, 2000; Mor & Winquist, 2002; Nolen-Hoeksema, 1991; Nolen-Hoeksema, 2000; Nolen-Hoeksema, Morrow, & Fredrickson, 1993; Nolen-Hoeksema, Parker, & Larson, 1994). Ruminative responses have also been linked to impaired problem solving (Donaldson & Lam, 2004 ; Lyubomirsky & Nolen-Hoeksema, 1995; Raes, et al., 2005; van Randenborgh, de Jong-Meyer & Huffmeier, 2010), reduced probability of enacting a plan (Ward, Lyubomirsky, Sousa, & Nolen-Hoeksema, 2003), negative bias on free recall of memories (Lyubomirsky, Caldwell, & Nolen-Hoeksema, 1998), difficulties regulating learning due to cognitive inflexibility (Davis & Nolen-Hoeksema, 2000), and poor social problem solving (Watkins & Baracaia, 2002).

Lyubomirsky and Tkach (2004) have suggested that the rumination in conjunction with negative affect sets in motion a cycle of adverse consequences such as: increased stress, impaired concentration, impaired motivation, poor problem solving, and negatively biased thinking. Within this cycle, feedback from any given area will impact others within the cycle maintaining the depressed mood and rumination. Returning to Jane from the above scenario, we find that Jane's rumination and depressive affect have resulted in a deficit in her ability to determine a

solution to her failed assignment. According to Lyubomirsky and Tkach's (2004) cycle of rumination we would expect to see this inability to problem solve increase her depressive affect. This in turn may impair her motivation, increase negative thoughts about her school work, or any combination of the adverse consequences listed above. These maladaptive responses to her failure will further fuel her rumination, making it increasingly difficult for Jane to disengage from the problem.

Goal Progress Theory. Applying Martin and Tesser's (1996) goal progress theory to the situation described above, Jane's ruminative response is caused by a discrepancy between her personal goal (doing well on her assignments) and the actual outcome (failing the assignment). According to goal progress theory, rumination is "conscious thinking directed toward a given object for an extended period of time" (Martin & Tesser, p.306) and occurs as a result of a failed attempt to progress toward an important goal. According to Martin and Tesser (1996), rumination will continue until the goal has been achieved, made sufficient progress toward, dropped or replaced by another more important goal. Within this framework, higher order goals (graduating university) are differentiated from lower order goals (passing an assignment). People meet lower order goals in order to meet higher order goals, creating a "goal hierarchy". Rumination occurs as a result of a discrepancy in achieving the higher order goals.

Martin and Tesser (1996) propose that people vary in their interpretation of goal discrepancies. Individuals who link achievement or failure in lower order goals to achievement or failure in higher order goals, are called "*linkers*". Linkers overgeneralize the significance of a failed goal, seeing the failed lower order goal as a block in obtaining happiness through achieving higher order goals. Whereas *non-linkers* believe their happiness can be derived from their ongoing actions rather than the results of past failures. Several studies have identified a

relationship between goal-linking and rumination (Martin & Tesser, 1996, McIntosh, Harlow & Martin, 1995; McIntosh & Martin, 1992; McIntosh, Martin & Jones, 2001). Not only do linkers have a higher propensity for rumination, they are also more likely to equate ratings of happiness with emotions derived from a past or present event (McIntosh, Martin & Jones, 1997) and display more depressive symptoms (McIntosh, Harlow & Martin, 1995; McIntosh, Martin & Jones, 2001). Furthermore, in a study involving a clinically depressed population, McIntosh, Gillanders and Rodgers (2010) found that the group of depressed participants were more likely to goal-link and ruminate than the non-depressive population and the group that was experiencing emotional difficulties not including depression.

Using the goal progress theory of rumination to interpret Jane's situation, Jane links her failing grade to a failure to achieve her larger goal of doing well in university. Because of Jane's tendency to goal-link it would be expected to see increased rumination, a heightened display of depressive symptoms and other negative affect until the discrepancy is met or the unmet goal has been dropped.

By examining Jane's scenario through the lens of response styles theory and goal progress theory, it can be seen that the interpreted reasons for ruminating are dependent on the theory of rumination applied. This becomes even more apparent when examining the various instruments used to measure ruminative tendencies. To understand the importance of the operationalization of rumination, one must first explore the measurement tools in this field.

Measuring Rumination. Just as there are many conceptualisations of rumination, there are a variety of questionnaires used to measure this concept (for a review see Smith & Alloy, 2009). Siegle, Moore and Thase (2004) found that scores reported on various rumination

measures to be variable. The inconsistent findings between measures may be due, in part to the wide array of definitions of rumination (Siegle et al. 2004).

The Ruminative Response Scale (RRS; Nolen-Hoeksema & Morrow, 1991) is the most commonly used measure of rumination (Kasch et al., 2001). The RRS is subscale of a larger instrument known as the Response Styles Questionnaire (RSQ; Nolen-Hoeksema & Morrow, 1991).⁴ The ruminative response scale originally consisted of 22 items that asked responders to rate their agreement to a series of statements regarding their response to depressed mood. These items were designed to assess three themes of responses to a negative mood: self-focus, symptom focus, and consequences and causes of mood. The RRS displayed high internal consistency (Alpha .89) and moderate test-retest reliability ($r=.47$ over 1 year) (Nolen-Hoeksema & Morrow, 1991). However, it was widely criticized for its overlap with depressive items found on the BDI (Smith & Alloy, 2009).

To address this criticism Treynor, Gonzales and Nolen-Hoeksema (2003) examined the RRS, removing all items that overlapped with depressive symptomology. The result was a ten-item, two-factor model. The first factor, *reflection*, refers to actions and thoughts that are trying to solve and understand the problem. While the second factor, *brooding*, focuses on the problem and the consequences of the problem⁵. This two-factor representation of rumination as conceptualized in the RRS has since been confirmed in two different studies (Arney et al., 2009; Schoofs, Hermans & Raes, 2010). Treynor and colleagues (2003) found that the brooding factor is associated with depression longitudinally, however the reflective component is related to depressive affect immediately following the event, but less so over one year. This finding

⁴ The other subscales in the RSQ are: Distracting Response scale, Problem-Solving scale and Dangerous Activities scale.

⁵ Reflection and brooding have also been called: Pondering and Brooding (Arney et al, 2009), Introspection and Self-blame (Roberts, Gilboa & Gotlib, 1998)

suggests that while reflection has immediate maladaptive properties, over time the focus on solving the problem may be useful in reducing negative affect. Due to each factor's differing relationship with depressive affect, Treynor, Gonzalez, and Nolen-Hoeksema (2003) suggested that brooding and reflection be treated as separate subscales of rumination.

There are two other significant criticisms of the RRS. First, the RRS involves asking the responder to indicate what they “generally” do when feeling “down, sad or depressed” (RRS). Mezulis, Abramson and Hyde (2002) point out that this lack of a specific context requires participants to make global reflections on their ruminative tendencies. Because participants are not asked to respond to a specific domain, accurate ratings on the RRS require a great deal of self-awareness of ruminative tendencies. A domain specific questionnaire would ask participants to reflect on a specific type of situation (academic, social, etc.), allowing for a more sensitive measure of rumination. Secondly, Wade, Vogel, Liao and Goldman (2008) highlight the dispositional nature of the RRS. While some people may ruminate about many events in their lives, others may only ruminate over specific domains of negative events (academics, body image, social situations). In order to understand how an individual copes and overcomes a specific situation, rumination measures must also look at specific domains (Wade, Vogel, Liao & Goldman, 2008).

In order to accommodate these criticisms, this study will utilize the Multi-Domain Rumination Scale (MDRS; Martin, 1999) to measure rumination. The MDRS is a nine-item, two-factor, domain specific rumination measure (for more information see Appendix A and methods section). While the MDRS was modeled after the RSS, the MDRS does not ask participants to report their responses to a sad affect, but rather to a stressful academic and/or social situation.

Operationalizing Rumination. Response styles theory (Nolen-Hoeksema, 1991) focuses on the act of repetitively thinking about the causes and consequences of negative affect. By focusing primarily on negative affect, the theory neglects situation specific effects and the metacognitive skills and beliefs associated with specific situations (Smith & Alloy, 2009; Wade, et al., 2008). In contrast, goal progress theory (Martin & Tesser, 1996) claims rumination occurs because of a discrepancy between actual and ideal goal state and involves focusing on the action rather than affect. While this view of rumination has received substantial empirical support, it has been demonstrated that rumination remains stable even when the individual is not confronted with failure (Spasojevic & Alloy, 2001).

Smith and Alloy (2009) propose that rumination should be defined as an “experientially avoidant emotion regulation strategy that arises in response to perceived discrepancies between desired and actual status” (p. 126). This definition encompasses the nature of both the response styles theory and the goal progress theory, while also accommodating the domain specific nature of the MDRS.

Using Smith and Alloy’s (2009) definition of rumination, we can interpret Jane’s discrepancy between her actual test score and her desired outcome as a source of rumination (similar to goal attainment theory). Her negative mood will be a result of this discrepancy and can serve to prolong the ruminative response (similar to response style theory). Jane may suffer the deleterious effects of ruminating on a failed academic task, however she may respond differently to a failure in other domains (as measured by the MDRS).

Achievement Goal Orientation

Achievement goal orientation, exploring why people engage and persist in tasks, is one of the most dominant theories in motivation (Anderman & Wolters, 2006). The original model of

goal orientation consisted of two classes of goals: a) performance goals -- demonstrating ability and avoiding demonstrations of low ability, and b) mastery goals -- developing greater competence or skills (Dweck & Elliot, 1983)⁶. Elliot & Harackiewicz (1996) proposed that there are two dimensions of performance goals; performance-avoid (avoiding demonstrating lack of competence) and performance-approach (demonstrating competence). Performance-avoid goals have been linked with poor performance (Elliot, Shell, Henry & Maier, 2005), low interest (Elliot & Harackiewicz, 1996) and low well-being (Elliot, Sheldon & Church, 1997).

Research examining performance-approach goals has produced conflicting findings. While there is evidence that a performance-approach orientation is associated with academic persistence (Elliot, McGregor & Gable, 1999; Harackiewicz et al. 2002; Li-Fang, 2006), there is also evidence suggesting that performance-approach goals are also associated with avoidance of challenging work (Harackiewicz, Barron & Elliot, 1998; Wolters, Yu & Pintrich, 1996).

Pintrich (2000) has proposed that mastery goals can also be broken down into mastery-avoid (working to avoid falling from previous standard due to lack of understanding of material) and mastery-approach (developing competence) goals. Learners who adopt mastery-approach goals are more persistent when confronted with challenges (Ames & Archer, 1988; Elliot & Dweck, 1988; Grant & Dweck, 2003; Wolters, 2004), and to be more intrinsically motivated (Elliot & Church, 1997; Heyman & Dweck, 1992) than individuals who have adopted performance-approach or avoid goals.

To date there is limited research focusing on mastery-avoid goals (Meece, Anderman & Anderman, 2006; Was, 2006). Ciani and Sheldon (2010) proposes two main concerns when

⁶ Constructs similar to performance goals as operationalized in this study: *ego-involved goals* (e.g., Nicholls, 1984), *ability goals* (e.g., Ames, 1992), *extrinsic goals* (Pintrich & Garcia, 1991). Constructs similar to mastery goals as operationalized in this study: (e.g., Ames, 1992; Butler, 1993; Elliot & Harackiewicz, 1996): *learning goals* (Dweck & Elliot, 1983), *task goals* (e.g., Middleton & Midgely, 1997; Nicholls, 1984), *learning goals* (Dweck & Legget, 1988).

examining mastery avoidant goals: 1) they are too uncommon to be useful, and 2) mastery-avoidance items on self-reports use negatively valenced emotion words, which may be confused with anxiety items rather than motivational constructs. Ciani and Sheldon (2010) found that while athletes may indicate they have mastery-avoidant goals when explaining their goal orientations in writing they described a performance-approach goal. Due to limited research in the area of mastery-avoid orientation, I will use the trichotomous goal framework, mastery, performance-approach, and performance-avoid, (Elliot, 1999) when referring to goal orientations.

Returning to the scenario involving Jane, we see that Jane's goal orientation will have an impact on what happens next. If Jane adopts a mastery-goal orientation, we would expect her to use the feedback provided on the essay to improve her subject and task knowledge so that she will improve her understanding of the course material. A performance-approach orientation may result in negative emotions for Jane if she has performed worse than others in her class, however this may spark a desire to improve so that she can prove she knows more than her peers on future assignments. Alternatively, Jane may adopt a performance-avoid orientation. In this instance we would expect Jane to disengage from the course in order to avoid future failures.

Goal Orientation and Rumination

Research examining both goal orientations and emotional regulation in the form of rumination has largely been neglected. In the few instances that research refers to both of these fields it is often in relation to the pursuit of goals. In these studies, the term "goal" is used to refer to the desired end product (Ciarocco, Vohs & Baumeister, 2010; van Randenborgh, Huffmeier, , LeMoult & Joormann, 2010), not the process or motivational factors surrounding the goal as defined in goal orientation literature.

Martin & Tesser's (1996) concept of goal-linking investigates the relationship between rumination and perception of goal attainment. In the model of goal attainment theory, a linker is described as a person who links the outcomes of lower order goals to the outcomes of higher order goals. This maladaptive perception of goal pursuit is very similar to Dweck & Elliot's (1983) view of performance goals and Elliot and Harackiewicz's (1996) conceptualization of performance-avoid goals. In both views of goal orientations, an individual decides to withdraw effort in order to prevent displays of incompetence. Goal-linkers and those adopting performance-avoid goals are stunted by a failure in a small goal that prevents them from seeing the end goal. Similarly, a non-linker could also be viewed as a person who has adopted a mastery goal orientation. To date, there has been no research that examines the relationship between Martin and Tesser's (1996) goal-linking and Dweck and Elliot's (1983) achievement goal orientations. However, similar definitions and research findings provide reason to believe there may be a relationship between achievement goal orientations and academic rumination.

The motivational literature is equally as sparse when examining the relationship between academic rumination and achievement goal orientations. In a series of studies exploring the operationalization of approach goals, Grant and Dweck (2003) documented a link between participants who adopt performance goals (ability goals) and rumination, noting that those who identified highly with performance-approach goals also had higher instances of rumination. This study relied on two self-report items to identify rumination statements: "I would dwell on how poorly I did" and "I would replay it all over and over again in my mind" (p.547). While these statements are similar to those used in rumination measurements, to truly explore the relationship between these two areas, validated scales are essential.

The preliminary findings of Grant and Dweck (2003) suggest a relation between achievement goal orientations and academic rumination. It is unclear if this relation is due to the mutual association of each of these constructs with depressive symptoms, or if the relation goes beyond this. The purpose of this study is to commence this exploration by: a) examine the relations between the reflection and brooding factors of rumination and goal orientations, and b) to test whether this relationship can account for variance beyond their shared relationship with depressive symptoms.

Research Questions

The primary purpose of this study is to examine the relations between rumination, goal orientation and depressive symptoms. The analysis will examine two types of relations between these constructs. The first uses a series of separate regression analyses to examine goal orientation's ability to predict rumination type (brooding and reflecting) and depression.

The secondary purpose was to explore whether relations between achievement goal orientations and academic rumination remain significant after accounting for their shared relationship with depressive symptoms. To test this a series of hierarchical regressions will be run using the various achievement goal orientations as dependent variables. By entering in depressive symptoms (BDI scores), brooding and reflection scores hierarchically, the predictive power of each construct will be evaluated for their unique contribution in predicting the three types of achievement goal orientations. I hypothesized that both depressive affect and brooding measures will be significant predictors of performance-avoid and mastery goal orientations.

Academic rumination was measured using the self-report measure, MDRS (Martin, 1999), that produces a unique score for the brooding and reflection subscales. The PALS (Midgley et al. 1997) was used to measure goal orientations because of the emphasis on the trichotomous

goal model, yielding separate scores for each of the subscales (mastery, performance-approach and performance-avoid). Based on evidence from Grant and Dweck (2003) and goal-linking research (Martin & Tesser, 1996), I hypothesize that individuals who report a tendency towards performance-avoid goal orientations will tend to report higher academic rumination (brooding and reflection) scores, while those who gravitate towards mastery-oriented goals will display lower instances of brooding and reflection. Performance-approach orientation is expected to have a weak negative relationship with academic rumination, however it is not expected that these relationships will be significant based on inconsistent findings within the performance-approach literature.

Chapter III – Methodology and Research Design

Population and Sample

This study analyses data collected as part of a larger study conducted in 1999. The 196 participants were students from the University of Notre Dame First Year Studies program. Participants' ages ranged from 17 to 20 years, with a mean age of 18.5 (SD=.60). The population was 59% female and 41% was male. The participant group was predominantly Caucasian (78.1%), with the remainder being Hispanic (5.6%), Asian (4.1%), African-American (1%), Native American (1%) and other (2.6%). 7.7% of the participants did not disclose their ethnicity.

This study was part of a larger study conducted at the University of Notre Dame. To examine this data at the University of Victoria I obtained approval for the analysis of secondary data from the Human Research Ethics Board.

Measures

Multi-Domain Rumination Scale (MDRS). The MDRS is a nine-item, two-factor (brooding and reflection) measure that was developed by Martin (1999) to examine ruminative tendencies in response to stressful academic and social situations. The MDRS adapts items from Nolen-Hoeksema's Ruminative Response Scale (RRS; 1991) to refer to specific domains of stressful events⁷. The RRS items refer to ruminating about being depressed across three themes: self-focus, symptom focus, and causes and consequences of the mood. The MDRS creates domain specificity by repeating items separately for each domain and providing domain specific instructions. The academic rumination scale began with the following statement:

⁷ The RRS prompts participants with the following statement "People think and do many different things when they feel depressed. Please read each of the items below and indicate whether you almost never, sometimes, often, or almost always think or do each one when you feel down, sad, or depressed. Please indicate what you *generally* do, not what you think you should do." (RRS; S. Nolen-Hoeksema, personal communication, March 10, 2010)

Everyone who is in school experiences many stressful academic events, but some people think about them a lot and some very little. A stressful academic event could include getting a bad grade, receiving negative feedback on a paper, or not understanding class material. We are interested in the degree to which you focus on or become preoccupied with particular kinds of thoughts in response to what you believe is a NEGATIVE ACADEMIC event in your life.

Similarly, the MDRS introduces the social domain rumination items with the following statement:

College students experience many stressful social events. Examples could include having few friends, not being invited to a social gathering, being rejected by a romantic interest, or doing something socially inappropriate. We are interested in the degree to which you focus on or become preoccupied with particular kinds of thoughts in response to what you believe is a negative SOCIAL event in your life.

The MDRS asks respondents to rate its domain specific items on a ten-point Likert scale ranging from 1 = *"I spend very little time doing this,"* to 10 = *"I do this all of the time and I can't seem to stop"*.

Consistent with modifications made to depressive rumination measures like the RRS (Treyner, Gonzalez & Nolen-Hoeksema, 2003), Martin and Van Boekel, (2010) excluded items from the MDRS that deal with future oriented thought. Watkins et al., (2005) recommended this change to ensure that rumination, **not** a person's tendency to worry, is being assessed. Martin and Van Boekel, (2010) removed an additional two items because of their similarity to items on the BDI. Exclusion of depressive items is consistent with current rumination research practices, (Treyner, Gonzalez & Nolen-Hoeksema, 2003). A factor analysis was performed on the

remaining items. Martin and Van Boekel, (2010) also removed two items because of high cross-factor loadings ($<.40$). The cross-loading items included “*Talking about the stressful or bad event,*” and “*Thinking about how the poor performance is all your fault.*” These items were dropped from subsequent analyses.

Martin and Van Boekel (2010) found that similar to factor analyses of the RRS (Armey et al., 2009; Schoofs, Hermans & Raes, 2010; Treynor, Gonzalez & Nolen-Hoeksema, 2003), their MDRS data was represented best by a two-factor model. The final 9 items of the MDRS and three factor loadings are shown in Table 9 in Appendix A.

Martin and Van Boekel’s (2010) factor analyses of the MDRS suggest that, in this data set, participants’ responses to stressful academic and social situations fall into two distinct but correlated ($r = .58, p < .001$) factors: *brooding* and *reflection*. The reflection factor contains four items that represent a response to stressful events that analyzes and seeks to solve the problem. In contrast, the brooding factor contains five items that represent fixating on stressful events without active contemplation of a plan for solving the problem. These findings are consistent with prior research on response patterns to stressful situations (Treynor, Gonzalez & Nolen-Hoeksema, 2003; Wade, Vogel, Yu-hsin Liao & Goldman, 2008). Treynor and colleagues’ (2003) longitudinal work found that over a period of one year the brooding factor was associated with depression, while the reflective component was related to depressive symptoms immediately following the event, but less so after a year had passed. This finding suggests that while reflection shares the immediate maladaptive properties of rumination, over time the focus on solving the problem may be useful in reducing negative affect. Due to each factor’s differing relationship with depression, Treynor, Gonzalez, and Nolen-Hoeksema (2003) have suggested

that brooding and reflection be treated as separate subscales of rumination. Therefore the current study treats brooding and reflection as subscales, analysing each score separately.

The Patterns of Adaptive Learning Survey (PALS). Midgley and colleagues (1997) developed the PALS to assess elementary and middle school students' academic goal orientation. There have been three revisions of the PALS dated 1993, 1996 and 1997. This study uses the 1997 version of the PALS, which Ross, Blackburn and Forbes (2005) note is the most reliable of the three. The trichotomous goal orientations examined by the PALS is based on the achievement goal orientation framework (Elliot & Harackiewicz, 1996)⁸.

The PALS assesses the extent to which students gravitate towards task/mastery, performance-approach, or performance-avoid goals when engaged in classroom and learning activities. The mastery orientation subscale contains five items that assess students' focus on the development of actual competence and authentic understanding. The performance-approach subscale consists of six items assessing students' focus on demonstrating academic competence and superiority. The performance-avoid subscale consists of six items assessing students' focus on avoiding demonstrations of incompetence. Each statement is rated on a 5-point Likert scale (1=Not true at all, to 5= very true).

Although Midgley et al. (1997) originally designed the PALS for use with elementary and middle school students, Ross, Shannon, Salisbury-Glennon and Guarino (2002) found that the PALS also produces reliable results for college/university students (Cronbach's alphas ranged from .70 to .85). In accordance with suggestions from Ross and colleagues (2002), items mentioning "teacher" and "class" were replaced with "instructor" and "course." Ross, Blackburn and Forbes' (2005) surveyed the internal consistency of the PALS subscales in 30 studies, and

⁸ For review of achievement goal orientations see introduction.

found an average Cronbach's alpha for the mastery/task, performance approach(pa), and performance avoid subscales were .79 (SD=.05), .79 (SD =.07) and .81 (SD=.04), respectively. Midgley et al. (1997) found evidence of convergent validity of the PALS validity with Nicholls' (1989) ego and task orientation goals (similar to performance-approach and mastery goals orientations respectively) goals ($r_{(\text{ego with pa})} = .63$; , $r_{(\text{task with mastery})} = .67$) . The PALS scales have demonstrated construct and predictive validity in research on self-efficacy, use of adaptive/maladaptive learning strategies and, of importance in this study, affect. Midgley and colleagues (1997) identified a series of experiments that explore the relation between positive affect and goal orientations. Overall, mastery goal orientation was positively linked with positive affect in reference to academics, while performance goals relate negatively or not at all to affect (Meece, Blumenfeld, & Hoyle, 1988; Nicholls, Patashnick, & Nolen, 1985; Nolen & Haladyna, 1990; Roeser, Midgley, & Urdan, 1996). A recent study conducted by Tupper (2008) found a negative relation between depressive affect and mastery goal orientation, and depressive affect was positively related to performance-avoid goal orientations. In a confirmatory factor analysis of the PALS using 647 sixth grade students, a model with separate subscale factors provided a better fit to the data than did a single factor model ($\chi^2 (116, N=647) = 298.55$, $p < .001$; GFI=.95; TLI=.95; CFI=.96; RMSEA=.049, $p(.05) = .55$), illustrating that the trichotomous goal structure of the PALS displays good internal discriminant validity.

The Beck Depression Inventory (BDI). The BDI (Beck et al., 1961) is a single score, 21-item self-report measure of depressive symptoms created for use with adults. Items on the BDI use a 4-point scale ranging from 0, "I do not feel sad at all" to 3, "I am so sad or unhappy that I can't stand it". Beck, Steer and Garbin (1988) conducted a meta-analysis of studies using the BDI spanning 25 years. They found that the BDI had high internal consistency ($\alpha = .86$ for

depressive sample, $\alpha=.81$ for non-psychiatric sample). Scores on the BDI are strongly correlated with clinical assessments of depression (mean $r=.72$ for clinically depressed samples, $r=.60$ for non-psychiatric samples), the Hamilton Psychiatric Rating Scale for Depression (mean $r=.73$ for clinically depressed samples, $r=.77$ for non-psychiatric samples), the Zung Self-reported Depression Scale (mean $r=.76$ for clinically depressed samples, $r=.71$ for non-psychiatric samples), the MMPI Depression Scale (mean $r=.76$ for clinically depressed samples, $r=.60$ for non-psychiatric samples), and the Multiple Affect Adjective Checklist Depression Scale (mean $r=.63$ for clinically depressed samples, $r=.63$ for non-psychiatric samples). These strong relationships between the BDI and other depressive measures suggest good concurrent validity. The BDI demonstrates good construct validity, relating as expected to biological symptoms of depression (Brooksbank & Coppen, 1967; Akiskal et al., 1982), suicide and alcohol abuse tendencies (Emery, Steer, & Beck, 1981; Fine & Steer, 1997), anxiety (Baker & Jessup, 1980; DeLeon, Skodol, & Rosenthal, 1978), and social desirability (Beck, 1972). In a series of investigations (Byerly & Carlson, 1982; Gallagher, Nies & Thompson, 1982) the BDI has successfully differentiated between psychiatric and non-psychiatric participants.

Procedure

In 1999 three hundred first year students from Notre Dame University were sent a letter from the university inviting them to participate in the larger study. One hundred and ninety-six students agreed to participate. Upon arrival at the laboratory an investigator described the purpose of the study in the same manner as was outlined in the initial contact letter. Participants then completed a battery of questionnaires and a computerized task. For the purposes of this study only the MDRS, PALS and BDI are analyzed. Participants received \$5 compensation for their participation.

Chapter IV – Results

Preliminary Analyses

Treatment of outliers. I examined the data for outliers by plotting distributions, histograms and boxplots. One case with an out-of-range value was removed. Another participant who scored 50 out of 50 on the brooding subscale was inspected but found to be consistent with the rest of the participant's data. Closer inspection of this participant's scores on the entire MDRS revealed that the scores on the reflective element of rumination were consistent with other participants. Therefore the participant's score was left in the data. A similar situation was seen on three participants' PALS scores. One mastery subscale and two performance-approach subscale scores initially appeared to be outliers; however, like the MDRS, the PALS measurement is randomly ordered and because the participants' other subscale scores were not outliers their extreme scores were not deleted.

Finally, five participants scored greater than three standard deviations above the mean on the BDI. Regression analyses were performed with these cases deleted and resulted in only minor improvements in the results, therefore it was decided to keep these cases in the analysis. Participants with scores greater than 18 were contacted and, with their permission, their First Year of Studies academic advisor was notified for further referral if needed. No participants expressed suicidal intention.

Gender and university entry year differences. To determine if gender and university entry semester (Fall cohort or Spring cohort) should be included as covariates, I conducted a series of hierarchical regressions of their main effects and two-way interactions as predictors of brooding, reflection and depressive symptoms. There were no significant interactions, and

gender was the only significant main effect. Gender was included as a covariate in subsequent analyses. (See Appendix B for analysis)

Ethnicity. All analyses were run selecting only those participants that identified themselves as white. These analyses resulted in a similar pattern of results when compared to the analyses using the entire sample with the exception of the regression examining the ability of the BDI and the MDRS subscales to predict performance-avoid scores. In the original analysis, only BDI and brooding were significant unique predictors of performance-avoid scores, however when conducting the same regression selecting only the white participants BDI, brooding and reflection were all significant predictors.

Descriptive data. The MDRS subscales demonstrated good internal reliability with Chronbach's Alpha's of .82 and .87 for reflection and brooding respectively. The subscales of the PALS also exhibited good internal reliability, with mastery, performance-approach, and performance-avoid alphas of .75, .83, and .86 respectively.

Table 1 presents the means, standard deviations, minimum and maximum scores for the BDI, reflective and brooding subscales of the MDRS, and the PALS subscales.

Table 1.
Mean Scores for BDI, Rumination and Motivation Orientation Subscales (N=196)

	M	SD	Min	Max
Depressive Symptoms (BDI)				
BDI Scores	7.03	5.96	0	31
Rumination (MDRS)				
Reflective	21.06	6.72	4.00	40.00
Brooding	17.75	9.67	5.00	50.00
Motivational Orientation (PALS)				
Mastery	19.76	3.12	10.00	25.00
Performance Approach	20.45	5.21	6.00	30.00
Performance Avoid	14.19	5.27	6.00	30.00

The bi-variate correlations among the variables are shown in Table 2. As theoretically prescribed, the performance-avoid and mastery subscales, were negatively correlated ($r = -.26$, $p < .01$), supporting discriminant validity of the PALS subscales. Performance-avoid was positively correlated with the performance-approach subscale ($r = .52$, $p < .01$).

The MDRS subscales, brooding and reflection, were significantly positively correlated ($r = .58$, $p < .01$). While the correlation obtained in this study is higher than that found by Treynor, Gonzalez and Nolen-Hoeksema ($r = .37$, $p < .001$; 2003), both studies reported significant positive correlations between brooding and reflection.

As expected, the BDI depressive symptom scores were significant and positively correlated with both reflection ($r = .41$, $p < .01$) and brooding ($r = .64$, $p < .01$) rumination subscales. Depressive symptoms were significantly negatively correlated with mastery goal orientation ($r = -.41$, $p < .01$) and positively correlated with the performance-avoid subscale ($r = .35$, $p < .01$). There was a significant positive correlation between the performance-avoid subscale and both rumination scales, reflection ($r = .33$, $p < .01$) and brooding ($r = .41$, $p < .01$). The mastery subscale was negatively correlated with the brooding subscale ($r = -.40$, $p < .01$).

Table 2.
Correlations between Measures (N = 182)

	Depression (BDI)	Rumination (MDRS)			PALS	
	1	2	3	4	5	6
Depression (BDI)						
1. BDI Score	1					
Rumination (MDRS)						
2. Reflection	.41**	1				
3. Brooding	.64**	.58**	1			
PALS						
4. Mastery (Task)	-.41**	-.11	-.40**	1		
5. Performance Approach	.12	.14	.19**	-.02	1	
6. Performance Avoid	.35**	.33**	.41**	-.26**	.52**	1

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Main Analyses

Overview. Three sets of regression analyses were conducted. This first set of regression analyses evaluated the joint contributions of the three goal orientations to each rumination scale. Specifically, two regression models regressed brooding, then reflection, onto the mastery, performance-approach, and performance-avoid subscales of the PALS.

The second set of regression analyses tested the significance of the relationship between depressive symptoms (BDI) and mastery, performance approach, and performance-avoid motivational orientation (PALS) subscales. In other words, the same mastery orientation predictor variables used in the first analyses were regressed onto the BDI.

The third set of regression analyses assessed whether rumination and depression contributed independently to goal orientation. As seen in the preliminary correlational analyses, both achievement goal orientation and rumination are significantly correlated with the BDI. Furthermore, achievement goal orientation and rumination both have a demonstrated relationship

with depression (Nolen-Hoeksema, 1991; Nolen-Hoeksema, 2000; Tupper, 2008). In order to differentiate between the shared relationship with depression and a unique relation between rumination and goal orientations analyses were conducted in a hierarchical fashion, entering the BDI into the regression model first, then brooding and reflection. This assesses whether the rumination subscales contributes to the prediction of the PALS subscales over and above the variance accounted for by depressive affect.

Regression of PALS goal orientation and gender onto rumination subscales. To examine the relations between negative ruminative responses and goal orientation, two hierarchical multiple regression were conducted. The first model predicted brooding and the second reflection. Regressions were run using standardized scores and using listwise deletion for missing variables. Previous research examining the relationship between gender and ruminative tendencies has found that women have a significantly greater tendency to ruminate when compared to men (Mezulis, Abramson & Hyde, 2002). Therefore gender was entered into the model first in order to control for the effects of gender. The standardized subscales of PALS (mastery, performance-approach and performance-avoid), gender and interactions between gender and each of the PALS subscales, as well as an interaction for mastery and performance-approach were entered as dependent variables. In the final model no interactions were significant, and will not be discussed in the following analysis.

Brooding. In the first step of this hierarchical analysis gender was entered as a control variable. This step accounted for 7% of the variance in ruminative brooding. Next, the PALS subscales were added into the model. The addition of these variables resulted in a significant increase in the model's ability to account for variance in brooding scores ($\Delta R^2 = .22, p < .001$). As hypothesized, mastery ($\beta = -.30, p < .001$) and performance-avoid ($\beta = .27, p < .001$)

significantly predicted brooding scores. These findings indicate that participants with higher mastery goal orientation score lower on the brooding scale, whereas participants reporting high performance-avoid reported higher brooding scores. As expected, performance-approach was not significant. Gender ($\beta = .27, p < .001$) positively predicted brooding scores. In this study, female participants were coded as a one and men were coded as a zero. This finding suggests that women tend to brood more than men, which is consistent with other findings in rumination literature (Mezulis, Abramson & Hyde, 2002). The final model is reported as Step 2 in Table 3.

Table 3.
Hierarchical Multiple Regression Analyses Predicting Brooding From PALS subscales and Gender

Predictor	R ²	β
Step 1	.07**	
Gender		.27**
Step 2	.29**	
Gender		.18*
Mastery		-.30**
Performance Approach		.07
Performance Avoid		.27**
n	185	

* $p < .05$. ** $p < .001$.

Reflection. The model described above was used to predict the reflection subscale of rumination. Again, when gender is entered first as a control variable it accounted for a significant amount of variance in reflection scores ($R^2 = .05, p < .01$). When mastery, performance-approach and performance-avoid scores were added simultaneously to the model, the adjusted model accounted for a significant change in the amount of variance accounted for ($\Delta R^2 = .08, p < .05$). In this model performance-avoid ($\beta = .30, p < .001$) and gender ($\beta = .21, p < .05$) were the only significant predictors of reflection, illustrating that when a participant reported high levels of performance-avoid tendencies they were more likely to display more

reflective scores. As with the brooding subscales, gender was significant, showing that women had a stronger tendency to reflect than did men. The final model is reported as Step 2 in Table 4.

Table 4.
Hierarchical Multiple Regression Analyses Predicting Reflection From PALS subscales and Gender

Predictor	R ²	β
Step 1	.05*	
Gender		.21*
Step 2	.13*	
Mastery		.15*
Performance Approach		.00
Performance Avoid		-.01
		.30**
n	183	

*p < .05. **p < .001.

Regression of PALS goal orientations and gender onto depressive symptoms (BDI).

In this set of analyses the rumination subscales were replaced with depressive symptoms as measured by the BDI as the independent variable. Gender accounted for a significant amount of variance, $R^2 = .02$ ($p < .01$). Adding the PALS subscales resulted in a significant change in the amount of variance accounted for ($\Delta R^2 = .19$, $p < .001$). A closer inspection of the model shows that mastery scores significantly negatively predicts BDI ($\beta = -.33$, $p < .001$), while performance-avoid subscale positively predicts BDI ($\beta = .21$, $p < .05$). These findings suggest that participants reporting high mastery orientation scores reported lower depressive symptoms, while those that reported high performance-avoid scores were more likely to report high depressive symptoms. The final model is reported as Step 2 in Table 5.

Table 5.
Hierarchical Multiple Regression Analyses Predicting Depressive Affect From PALS subscales and Gender.

Predictor	R ²	β
Step 1	.02*	
Gender		.15*
Step 2	.21**	
Mastery		.07
Performance Approach		-.33**
Performance Avoid		.02
n	193	.21*

*p < .05. **p < .001.

Regression of brooding, reflection and BDI onto PALS goal orientation subscales.

Achievement goal orientation and rumination both have a demonstrated relationship with depression. In order to differentiate between the shared relationship with depression and a unique relation between rumination and goal orientations three separate hierarchical regressions predicting the individual subscales of the PALS (mastery, performance-approach, and performance-avoid) were tested. Depressive symptomology were added to the model first, followed by brooding and reflection, in order to determine if the rumination subscales contributes to the prediction of the PALS subscales over and above the variance accounted for by depressive affect.

In this set of analysis three hierarchical regressions were performed, one for each of the PALS subscales: mastery, performance-approach and performance-avoid. Previous research conducted by Tupper (2008) found that BDI scores significantly predicted each of the PALS subscales; therefore there is a theoretical basis for entering the BDI as a predictor variable into the model first. Following BDI, brooding and reflection were entered into the model simultaneously. Gender was then entered into the model followed by the simultaneous entry of

all two-way interactions for the variables in the model. The addition of gender or the interaction variables did not significantly add to the predictive value of the model, and will not be discussed in the following analysis.

Mastery Orientation. When only BDI was entered into the equation, the model accounted for 16% ($p < .001$) of the variance in mastery orientation scores. The MDRS subscales were then added simultaneously resulting in a significant change in the $R^2 = .06$ ($p < .05$). All three dependent variables were significant predictors of mastery orientation scores. BDI ($\beta = -.41, p < .001$) and brooding ($\beta = -.33, p < .001$) negatively predicted mastery orientation, while reflection ($\beta = .20, p = .05$) had a positive beta coefficient. These findings indicate that participants reporting higher depressive symptomology and brooding tendencies were more likely to report lower mastery orientations, while those who reported high reflection scores had reported high mastery orientation scores. The final model is reported as Step 2 in Table 6.

Table 6.

Hierarchical Multiple Regression Analyses Predicting Mastery Goal Orientation From BDI and MDRS Subscales

Predictor	R^2	β
Step 1	.16**	
BDI		-.41**
Step 2	.22*	
BDI		-.27*
Reflection		.20*
Brooding		-.34**
n	180	

* $p < .05$. ** $p < .001$.

Performance-approach. The model containing the predictor variables BDI, reflection and brooding, did not significantly predict performance-approach scores (see table 7). In this model no variables were significant. These findings are expected based on the findings from the

initial analysis where performance-approach did not contribute uniquely to the prediction of BDI, reflection or brooding scores.

Table 7.

Hierarchical Multiple Regression Analyses Predicting Performance-Approach Goal Orientation From BDI and MDRS Subscales

Predictor	R ²	β
Step 1	.02	
BDI		.12
Step 2	.04	
BDI		.00
Reflection		.04
Brooding		.17
n	180	

* $p < .05$. ** $p < .001$.

Performance-avoid. When entered first, BDI accounts for a significant percentage of variance in performance-avoid scores ($R^2 = .13$, $p < .001$). The two rumination factor subscales were then added to the model simultaneously, resulting in a significant change in $R^2 = .07$ ($p < .005$). As predicted brooding ($\beta = .25$, $p < .05$) and BDI scores ($\beta = .35$, $p < .005$) positively predicted performance scores. The reflection subscale did not have a significant unique contribution to the prediction of performance-avoid in this model ($\beta = .13$, $p = .13$). The final model is reported as Step 2 in Table 8.

Table 8.

Hierarchical Multiple Regression Analyses Predicting Performance-Avoid Goal Orientation From BDI and MDRS Subscales

Predictor	R ²	β
Step 1	.13**	
BDI		.35**
Step 2	.19**	
BDI		.15
Reflection		.13
Brooding		.25*
N	180	

* $p < .05$. ** $p < .001$.

Chapter V – Discussion

Primary Research Question

The primary purpose of this study was to examine the relations between students' achievement goal orientations and their tendencies to ruminate in the face of a stressful academic situation. In the first set of analyses the PALS subscales, mastery and performance-avoid, accounted for a significant portion of variance in each of the rumination subscales, reflection and brooding. These findings point to a shared relation between the adoption of achievement goal orientations and ruminative tendencies.

As hypothesized, participants reporting a high tendency for adopting a performance-avoid goal orientation were more likely to report engaging in rumination over stressful academic events. This was true for both subscales of academic rumination - reflection and brooding - assessed in this study. In fact, the strength of each type of rumination's relationship with performance avoid academic motivation were quite similar. In other words, individuals who report preferring performance-avoid goals in academic situations are more likely to engage in both brooding and reflective ruminative responses to a stressful academic situation.

Adopting a performance-avoid goal in an academic situation means the individuals are more likely to engage in avoidant behaviour, distancing themselves from situations where incompetence might be displayed. This avoidant behaviour requires a degree of thought suppression when attempting to avoid potential failures. While it may seem counterintuitive to link rumination with thought suppression, Wenzlaff and Luxton (2003) found that in stressful situations efforts to suppress thoughts can lead to rumination. According to Wegner's (1994) ironic processes theory, thought suppression utilizes two mechanisms: intentional distraction and monitoring for unwanted thoughts that signal a need for further distractions. In stressful

situations distraction becomes difficult because the individual's cognitive system may become overloaded dealing with the stress. College students monitor many of their tasks informally (Zimmerman & Paulsen, 1995), displaying an automatic process that is minimally affected in stressful situations. In stressful situations, a limited ability to distract results in unwanted thoughts surfacing with increased frequency due to the vigilant monitoring systems employed in thought suppression. In their longitudinal study, Wenzlaff and Luxton (2003) found that participants from the high suppression group who encountered self-reported stress during a ten-week timeframe reported significantly higher rates of rumination and depressive symptoms when compared to initial ratings. No significant changes were observed for the other participant groups (high stress, low suppress; low stress, high suppress; low stress, low suppress). Relative to these other groups, the high stress, high suppressing group reported the highest rumination and depressive symptom scores.

In the present study, I found that individuals reporting a tendency to adopt performance-avoid goals also reported a tendency to ruminate in stressful academic situations. This relation may be explained by applying Wegner's (1994) ironic processes theory. An individual who adopts a performance-avoid goal in an academic situation engages in a series of avoidant behaviours such as withdrawing effort from future assignments in order to prevent displays of incompetence. In a highly competitive university setting, reminders of the importance of academic success are everywhere. Students may withdraw effort, however, attempts to distract and maintain this avoidant behaviour will be undermined by reminders of the academic failure. Subconscious monitoring will continually alert the individual of signs of failure with increasing intensity. These persistent and uncontrollable reminders of academic stressors may then lead to academic rumination (Wenzlaff & Luxton, 2003). It is important to note that thought

suppression as a possible mediating factor in the relation between achievement goal orientation and academic rumination was not studied in this investigation. However, exploring thought suppression in this context is an important next step in the understanding the link between these two fields.

Participants reporting a propensity for adopting mastery goal orientations were more likely to report lower brooding scores in stressful academic situations. Mastery goals are associated with many adaptive patterns such as task persistence and elevated levels of interest even when confronted with challenging academic situations. Possessing a mastery goal orientation is not enough to ensure successful academic performance. Individuals adopting mastery goals, just as those adopting performance-approach or performance-avoid goals, will also be confronted with academic failures. Why then, do those that adopt mastery goals report a decreased likelihood of brooding following a stressful academic situation?

It may be that those who adopt mastery goals have repetitive thoughts that are focused more on problem solving rather than the affective elements of a given failure. Goal-linking research, like achievement goal orientation's concept of mastery orientation, suggests that non-linkers (individuals who do not link emotions to failures or setbacks of smaller goals while in pursuit of an over-arching higher goal) care more about the emotions that are derived from the process than the final results (Martin & Tesser, 1996). This focus on the pleasure of performing an activity, even when failing, could act as a distractor mitigating the negative feelings that often accompany failure. In experimental studies, the use of distraction in stressful situations has demonstrated decreased ruminative responses to stressful situations in both patients with depressive symptoms and those without (Lyubomirsky, Caldwell, & Nolen-Hoeksema, 1998; Wong & Moulds, 2009). Perhaps because those who adopt mastery goals are pre-occupied with

the thrill of the challenge, they are able to avoid focusing on the negative thoughts, thus preventing ruminative style responses to failure.

Conversely, it may be that in order for an individual to adopt a mastery goal orientation they must first be able to fully regulate their emotions without ruminating. van Randenborg, Huffmeier, LeMoult and Joormann (2010) found that individuals prone to ruminating had lower instances of skipping unsolvable anagrams in an impossible anagram test. Rumination, by inhibiting goal disengagement, acts a barrier preventing individuals from successfully regulating their performance. Similarly, Moberly and Watkins (2010) found that individuals failing to make progress towards their daily goals reported higher instances of rumination. These findings taken together create a maladaptive cycle, where individuals prone to ruminate find themselves in a situation where disengaging from an unrealistic goal is difficult, inevitably leading to failure. This failure, in turn, increases levels of rumination that are accompanied by a host of other maladaptive consequences. However, we know that not all academic failure situations lead to a vicious negative cycle of ruminative thoughts. In fact, individuals who adopt mastery-goal orientations persist in the presence of a challenging academic situation⁹ and, as found in this study, report lower instances of ruminating in stressful academic situations. Study two of van Randenborg, Huffmeier, LeMoult and Joorman's (2010) article examined the use of distraction in order to lessen the effects of rumination on goal disengagement. They found that when individuals were manipulated with a distraction they were more likely to skip unsolvable anagrams than the ruminating participants. In other words, when individuals were prompted with a strategy to help regulate their emotions by preventing ruminative thoughts, they were able

⁹ Research findings have been inconsistent when exploring the links between academic performance and mastery goal adoption (Hulleman et al, 2010). Motivational researchers have attempted to reconcile these inconsistencies by proposing that individuals can pursue multiple goals (Barron & Harackiewicz, 2001). The multiple goal framework suggests that one can pursue multiple achievement goals to varying degrees. Barron and Harackiewicz (2001) found that adopting of both mastery goals and performance-approach goals resulted in optimal achievement.

to overcome/avoid insurmountable obstacles while in pursuit of overarching goals. van Randenborg, Huffmeier, LeMoult and Joorman's (2010) article provides evidence that being able to affectively regulate one's emotions may be a prerequisite to the ability of adopting a mastery goal orientation.

Performance-approach did not significantly predict brooding or reflection. In contrast with our findings, Grant and Dweck (2003) found that individuals who adopted performance-approach goals had higher instances of rumination. These seemingly contradictory findings can be explained in two ways. First, Grant and Dweck used a two-item measure of rumination that may not have been as sensitive to rumination as the MDRS used in this study.

Second, in their article, Grant and Dweck (2003) propose four different types of performance goals: learning goals, ability-linked goals, normative goals and outcome goals. According to Grant and Dweck, the way a performance goal is operationalized will impact learning outcomes. Their study found that *ability-linked goals*, a goal aimed at validating ability, were linked to ruminative tendencies. Grant and Dweck used three items to define ability-linked goal orientation. These three items are similar to those used in the performance-approach orientation subscale of the PALS. However, unlike the PALS measure of achievement goal orientations, Grant and Dweck do not provide a performance-avoid type goal orientation. Therefore the different results found in this study and that of Grant and Dweck may be due to the way performance goals and rumination were operationalized. Future research examining the relation between academic rumination and achievement goal orientation fields must seek to establish a uniform conceptualization of the terminology. In this study, I discussed the differences of key views of rumination; a similar discussion could be formed for achievement goal orientation (see Hulleman, Schrage, Bodmann, & Harackiewicz, 2010 for a review). Based

on the decision to use the PALS to measure achievement goal orientations, this study explored goal orientations using the trichotomous goal framework. Future researchers must seek to clarify their conceptualization of both rumination and achievement goal orientation constructs.

In the final set of analyses, a series of hierarchical regressions were used to determine if brooding and rumination could predict the variance in the PALS subscales after accounting for the predictive power of depressive affect. As hypothesized, brooding and reflection accounted for a significant amount of the variance in predicting mastery and performance-avoid goal orientation, indicating that the relation between academic ruminative tendencies and achievement goal orientations extends beyond a shared relationship with depressive symptoms.

Prior research displayed links between rumination and depression (McIntosh, Harlow & Martin, 1995; McIntosh, Martin & Jones, 2001) and achievement goal orientations and depression (Tupper, 2008), therefore this set of analyses was key to providing evidence for a relation between the fields of academic rumination and achievement goal orientations beyond a shared relationship with depression. Consistent with the findings of the primary analyses, inclusion of the academic rumination subscales into the model containing BDI scores resulted in a significantly improved model when predicting both mastery and performance-avoid goal orientations.

Limitations and Future Research

The current study is limited by the use of a new, unvalidated rumination measure. While the MDRS was derived using the RRS and displayed many of the same characteristics (two-factor design, similar correlations within the measure and with depression, see Martin & Van Boekel, 2010), this measurement has not been tested in a variety of contexts. Treynor, Gonzalez, & Nolen-Hoeksema (2003) have discussed the need to increase the number of items in each of

the brooding and reflection subscales of the RSQ in order to increase construct validity and reliability. As the MDRS is modeled after the RSQ, the same can be said of the MDRS. Based on the outcomes of this study a further area of improvement of the MDRS should also look at the perceived ability to control one's emotions when confronted with a stressful academic situation.

A further limitation regarding the measurement of rumination is that participants were given a series of examples of negative academic events (bad grades, receiving negative feedback) and asked to report on how they would respond. Students were not asked to record the type of negative academic event they were evaluating and I therefore cannot assess the magnitude or importance of the event. However, because this study is only examining the relation between academic rumination and achievement goal orientation, potential mediating factors such as goal importance are beyond the scope of analysis.

This study is also limited in its ability to make definitive statements about the causes of the links between rumination and achievement goal orientation. Using a series of regressions to predict the relation between constructs allows for associative statements about the relationship, however only further investigation into the connections between academic rumination and achievement goal orientation will allow for causal statements about these two constructs.

The sample used in this study was made up of predominantly white (78%) university students limiting the generalisability of the findings. Firstly, school environments play a role in shaping students' goal orientation (Meece, Anderman, & Anderman, 2006). The University of Notre Dame is a highly competitive university and the competitive nature of the school environment may have had an influence on motivational patterns reported by the participants in this study. Secondly, one of the hypothesized links between academic rumination and achievement goal orientations is both constructs' shared association with thought suppression.

Suppressing emotions, more specifically emotional expressions, is associated with negative consequences in Western cultures such as increased negative emotion. In Asian cultures, suppressing emotional expressions was not associated with any negative effect (Butler, Lee, & Gross, 2007). A person's emotional reaction to a stressful academic situation may be influenced by cultural values. Considering these points, it is important that future research replicate the current study using more diverse populations.

Future experimental research in this field should look at the relationship between distraction and rumination in conjunction with the adoption of mastery goals in a failure-induced situation. We know that distracting individuals from ruminating is an effective strategy to reduce depressive affect (Lyubomirsky, Caldwell, & Nolen-Hoeksema, 1998; Wong & Moulds, 2009). To further an understanding of the relation between these two areas of study, research should determine if the ability to emotionally regulate is a prerequisite to adopting a mastery goal orientation or if the inherent pleasure obtained from participating in a challenging task can override the negative emotions that may arise when confronted by failure. This may be done by examining what, if any, the impact of distraction is in a mastery goal orientation situation, or if mastery is enough of a buffer in a failure situation on its own.

Conclusion

Overall, the findings from this analysis suggest that there is a relation between academic rumination and achievement goal orientation and that this association goes beyond a shared relationship with depressive affect. These studies have shown that rumination, specifically brooding, has a negative relation with mastery orientation and a positive relation with performance-avoid goal orientations. The reflection dimension of rumination is positively associated with mastery orientation and negatively associated with performance-avoid goal

orientations. These findings have important implications for the study of achievement goal orientations because they point to the possibility that efforts to set up mastery oriented classrooms may be undermined by some students' lack of ability to regulate their emotions when faced with stressful academic situations.

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Appendix A

Multi-Domain Rumination Scale – Academic (MDRS; Martin, 1999)

Note that only items 3, 5, 6, 7, 8, 10, 12, 13 and 14 were used in this study based on Martin and Van Boekel's (2010) factor analysis (see table 9 for factor loadings organised by subscales).

College students experience many stressful academic events. Examples could include, getting lower grades than expected, receiving negative feedback on a paper or not understanding class material. We are interested in the degree to which you focus on or become preoccupied with particular kinds of thoughts in response to what you believe is a negative ACADEMIC event in your life.

When something bad or stressful happens in your ACADEMIC LIFE, how much time do you spend . . .

I spend very little time doing this

I do this Somewhat

I do this all the time & I can't seem to stop myself

circle the number that best describes you.

1. Thinking about how the stressful event is all your fault. 0 ___ 2 ___ 3 ___ 4 ___ 5 ___ 6 ___ 7 ___ 8 ___ 9 ___ 10

2. Thinking about how the event will negatively affect your future. 0 ___ 2 ___ 3 ___ 4 ___ 5 ___ 6 ___ 7 ___ 8 ___ 9 ___ 10

3. Thinking about what the event means about you. 0 ___ 2 ___ 3 ___ 4 ___ 5 ___ 6 ___ 7 ___ 8 ___ 9 ___ 10

4. Thinking about how the cause of the event will lead to other negative things in your life. 0 ___ 2 ___ 3 ___ 4 ___ 5 ___ 6 ___ 7 ___ 8 ___ 9 ___ 10

5. Thinking about the causes of the stressful event. 0 ___ 2 ___ 3 ___ 4 ___ 5 ___ 6 ___ 7 ___ 8 ___ 9 ___ 10

6. Thinking about how the stressful 0 ___ 2 ___ 3 ___ 4 ___ 5 ___ 6 ___ 7 ___ 8 ___ 9 ___ 10

event will affect
other areas of your
life.

7. Thinking about how important the stressful event is to you. 0 ___ 2 ___ 3 ___ 4 ___ 5 ___ 6 ___ 7 ___ 8 ___ 9 ___ 10

8. Thinking about how things like this always happen to you. 0 ___ 2 ___ 3 ___ 4 ___ 5 ___ 6 ___ 7 ___ 8 ___ 9 ___ 10

9. Thinking about what the event means about your ability to cope with events in the future. 0 ___ 2 ___ 3 ___ 4 ___ 5 ___ 6 ___ 7 ___ 8 ___ 9 ___ 10

10. Wondering why you can't handle this kind of thing without getting upset. 0 ___ 2 ___ 3 ___ 4 ___ 5 ___ 6 ___ 7 ___ 8 ___ 9 ___ 10

11. Thinking about all your shortcomings/ faults / mistakes. 0 ___ 2 ___ 3 ___ 4 ___ 5 ___ 6 ___ 7 ___ 8 ___ 9 ___ 10

12. Losing sleep because you can't stop thinking about the stressful event. 0 ___ 2 ___ 3 ___ 4 ___ 5 ___ 6 ___ 7 ___ 8 ___ 9 ___ 10

13. Thinking about why this kind of thing happens to you and not others. 0 ___ 2 ___ 3 ___ 4 ___ 5 ___ 6 ___ 7 ___ 8 ___ 9 ___ 10

14. Remembering and replaying the bad event over and over again in your head. 0 ___ 2 ___ 3 ___ 4 ___ 5 ___ 6 ___ 7 ___ 8 ___ 9 ___ 10

15. Talking about the stressful or bad 0 ___ 2 ___ 3 ___ 4 ___ 5 ___ 6 ___ 7 ___ 8 ___ 9 ___ 10

event.

circle the number that best describes you.

Table 9.

Factor Loadings and Communalities (Comm) for Brooding and Reflection Subscales of Academic and Social MDRS Final Nine Items

Brooding Items	Entire Sample					
	Academic			Social		
	Reflect	Brood	Comm	Reflect	Brood	Comm
13. Thinking about why this kind of thing happens to you and not others.		.87	.77		.85	.79
12. Losing sleep because you can't stop thinking about the poor performance.		.65	.48		.66	.48
14. Remembering and replaying the poor performance over and over again in your head.	.30	.73	.63	.43	.69	.66
10. Wondering why you can't handle this kind of thing without getting upset.	.32	.73	.64		.76	.66
8. Thinking about how things like this always happen to you.		.84	.75	.31	.83	.78
Reflection Items						
7 Thinking about how important the performance is to you.	.83		.72	.82	.32	.78
3. Thinking about what the poor performance means about you.	.73	.30	.63	.75	.45	.76
6. Thinking about how the poor performance will affect other areas of your life.	.68	.41	.62	.69	.42	.65
5. Thinking about the causes behind the poor performance.	.81		.68	.87		.78

Appendix B

To determine if any covariates should be included in this study three hierarchical multiple regressions were conducted. The first model predicted brooding, followed by reflection and then depressive symptoms. Regressions were run using standardized scores and using listwise deletion for missing variables. In the first step of each model gender was entered on its own. In step 2 cohort was added to the model. The final step included the two-way interaction between gender and cohort. In the final model no interactions were significant, and will not be discussed in the following analysis.

Gender was the only variable to have a significant, unique contribution to the prediction of each of the dependent variables and was therefore included as a covariate in the primary analysis. (see tables 10, 11 & 12 below)

Table 10.
Hierarchical Multiple Regression Analyses Predicting Academic Brooding From Gender and Cohort (Fall or Spring enrolment) and two-way interactions

Predictor	R ²	β
Step 1	.09**	
Gender		.29**
Step 2	.09	
Gender		.29*
Cohort		-.04
n	172	

*p < .05. **p < .001.

Table 11.

Hierarchical Multiple Regression Analyses Predicting Academic Reflection From Gender and Cohort (Fall or Spring enrolment) and two-way interactions

Predictor	R ²	β
Step 1	.05*	
Gender		.21*
Step 2	.05	
Gender		.22*
Cohort		.07
n	183	

*p < .05. **p < .001.

Table 12.

Hierarchical Multiple Regression Analyses Predicting Depressive Symptoms (BDI) From Gender and Cohort (Fall or Spring enrolment) and two-way interactions

Predictor	R ²	β
Step 1	.02*	
Gender		.15*
Step 2	.03	
Gender		.14*
Cohort		-.09
n	193	

*p < .05. **p < .001.