

The Moderating Effect of Mindfulness on the Relationship
Between Rumination and Regret

Pitchaya Chulpaiboon 553 75699 38

Matawan Srisawad 553 75727 38

Khattaleya Limsakdakul 553 75521 38

Senior Project Submitted in Partial Fulfillment of the Requirements
for the Degree of Bachelor of Science in Psychological Science

Faculty of Psychology

Chulalongkorn University

Academic Year 2016

Senior Project Title	The Moderating Effect of Mindfulness on the Relationship Between Rumination and Regret
Author(s)	1. Pitchaya Chulpaiboon 2. Matawan Srisawad 3. Khattaleya Limsakdakul
Field of Study	Psychological Science
Senior Project Advisor	Nattasuda Taephant

This senior project is accepted by the Faculty of Psychology, Chulalongkorn University in partial fulfillment of the requirements for the Bachelor of Science degree (Psychological science).

.....
Dean of the Faculty of Psychology
(Assistant Professor Dr. Kakanang Maneesri)

Senior project committee

..... Chairperson
(Dr. Somboon Jarukasemthawee)

..... Advisor
(Dr. Nattasuda Taephant)

..... Committee
(Dr. Prapimpa Jarunratanakul)

5537569938, 5537572738, 5537552138: Bachelor of Science

KEYWORDS: REGRET / MINDFULNESS / RUMINATION

PITCHAYA CHULPAIBOON, MATAWAN SRISAWAD, KHATTALEYA
LIMSAKDAKUL: THE MODERATING EFFECT OF MINDFULNESS ON THE
RELATIONSHIP BETWEEN RUMINATION AND REGRET

ADVISOR: NATTASUDA TAEPHANT, Ph.D., 78 pp.

Abstract

This study examined the moderating effect of mindfulness on the relationship between rumination and regret. The participants were 193 Thai university students, of which 189 were included in the analysis. Participants were instructed to complete rumination, mindfulness, and regret scales, where the regret scale asked participants to read a regret inducing scenario beforehand. Results were partially supportive of our hypotheses. There was a significantly positive correlation between rumination and regret, as well as the negative correlation between rumination and mindfulness. In contrast with our expectation, the correlation between mindfulness and regret was not significant as we hypothesized. The interaction effect of mindfulness on the relationship between rumination and regret was also not significant. This study is the first to examine regret in relation to rumination and mindfulness in the Thai sample. We suggest the regret scale be further tested in Thai population to determine the appropriate factors involved in Thai's sense of regret, and to further validate the regret scale.

Field of Study: Psychological science Student's Signature.....

Academic Year: 2016 Student's Signature.....

Student's Signature.....

Advisor's Signature.....

Acknowledgments

First and foremost, we would like to express our greatest gratitude to professor, Dr. Nattasuda Taephant, our senior project advisor, who has given us full support throughout this journey. Dr. Nattasuda Taephant was patient, kind, and caring. Despite her tight work schedule, she constantly gave us insightful advices and feedbacks as well as checking up on us to make sure that we were able to create the best work possible. Without her, this work would not be possible.

We would also like to express our gratitude to Mr. Karin Vilavorn who never forgets to remind us of the important dates and events and who was always able to give us relevant information and solution whenever we ran into problems. Importantly, data collection would not be possible without the kind cooperation from our participants, who completed the lengthy survey for us.

Last but not the least, we would like to show appreciation to our families. Throughout the period when we were working on this research paper, their care and love were our sources of strength.

Table of Contents

Abstract.....	iii
Acknowledgements.....	iv
Contents.....	v
List of Tables.....	vii
Chapter 1: Introduction.....	1
1.1 Literature Review.....	4
1.1.1 Rumination.....	4
1.1.2 Regret.....	12
1.1.3 Mindfulness.....	20
1.2 Research Questions.....	26
1.3 Hypotheses.....	26
Chapter 2: Methodology.....	29
2.1 Participants.....	29
2.2 Measures.....	29
2.3 Procedure.....	40
2.4 Statistical Analysis.....	40
Chapter 3: Results.....	42
Demographics.....	42
Pearson’s Correlation.....	44
Moderated Multiple Regression.....	45

Chapter 4: Discussion.....	48
Hypothesis I.....	48
Hypothesis II.....	49
Hypothesis III.....	50
Hypothesis IV.....	51
Limitation.....	51
Future Research.....	52
Theoretical and Practical Applications	52
References.....	55
Appendix A: Rumination Scale.....	70
Appendix B: Mindfulness Scale.....	72
Appendix C: Regret Scale.....	73
Appendix D: Approval of Regret Scale and Scenario	74
Appendix E: Permission to Use Scales.....	75
Appendix F: Regret Scale Corrected Item-Total Correlation Value.....	76
Bibliography.....	77

List of Tables

	Page
Table 1. Ratings on the Response Styles Questionnaire Scale.....	30
Table 2. Comparison of Rumination Scales.....	31
Table 3. Ratings on the Freiburg Mindfulness Inventory Scale.....	32
Table 4. Comparison of Mindfulness Scales.....	33
Table 5. Ratings on the Regret Scale.....	35
Table 6. Comparison of Regret scales.....	36
Table 7. Cronbach's Alpha of Response Style Questionnaire, Mindfulness Inventory, and the Regret Scale.....	39
Table 8. Demographic frequencies.....	42
Table 9. Descriptive statistics on Regret, Rumination, and Mindfulness.....	44
Table 10. Correlational Table between Regret, Rumination, and Mindfulness....	44
Table 11. Tolerance and VIF Value for Independent Variables.....	45
Table 12. Moderated Multiple Regression Analysis for Predicting Variables and Regret.....	46
Table 13. Results summary for the five hypotheses.....	47

Chapter 1

Rationale

In recent years, emotional adjustment and stress in university students have been one of the common and heated topics in research. University students suffer from stress due to factors such as environmental change and academic expectations (Hamaideh, 2009). This has been linked to high suicide rates. Starting from 2007, the suicide rate among those aged 15 to 24 years old has risen from 9.6 deaths per 100,000 to 11.1 within only six years (Scelfo, 2015). Regret could be one contributing factor to this issue as findings have revealed that one of the most common regrets people have involves education-related issues, either not having tried hard enough in their studies or missing out on educational opportunities (Kinnier & Metha, 1989).

Decisions are being made almost all the time throughout people's life no matter big or small; it could be about what to eat for dinner or whether to marry or not. While there are correct choices, decisions can also go wrong. When people blame themselves and think about how a different choice or action could have made the situation better, they experience a negative emotion called 'regret' (Marcatto & Ferrante, 2008; Zeelenberg, van Dijk, Manstead, & der Pligt, 1998a). Regret is fairly common such that up to 90 percents of adults experience it (Wrosch, Bauer, & Scheier, 2005). In people's daily conversation, Shimanoff (as cited in Zeelenberg, 1999) revealed that regret was revealed to be the most frequently mentioned negative emotion and second only to the word love in terms of emotion in general. While regret can be adaptive such that its unpleasantness motivates people to take remedial actions to undo the cause of regret (Zeelenberg, 1999), many research has shown that it could be damaging at the same time. Regret uniquely predicted 11.9 percent of variance in depression (Lecci, Okun, & Karoly, 1994). It was shown to be correlated to greater secretion of cortisol or the stress hormone

in adults (Wrosch, Bauer, Miller, & Lupien, 2007), as well as sleep disturbances in nurses and physicians (Courvoisier, Agoritsas, Perneger, Schmidt, & Cullati, 2011). In general, regret was associated with lower life satisfaction (Pethtel & Chen, 2014). Rumination is one possible response people have toward regret.

Rumination is the process of thinking in circles which may have its origins towards resolving internal conflict (Papageorgiou & Wells, 2004). This is how past literature has found the relationship between regret and rumination. Once a person feels regret, some models of rumination would state that rumination would occur in order for the person to make sense of their situation (Lyubomirsky & Nolen-Hoeksema, 1993; Papageorgiou & Wells, 2004; Ingersoll-Dayton, Torges, & Krause, 2010). However, rumination is not only an effect from regret or a negative affect. Other research has found rumination to be the mediating factor towards depressive symptoms (Orth, Berking, & Burkhardt, 2006; Ingersoll-Dayton et al., 2010). To this extent, rumination was indicated to be related to depression as well as anxiety (Papageorgiou & Wells, 2004). Moreover, as rumination was found to intensify negative affect (Lyubomirsky & Nolen-Hoeksema, 1995; Almeda & Kessler, 1998), it is an area worth exploring to further understand, if not to find an intervention to improve well-being to those affected by it. As recent research in Eastern psychology has found, mindfulness is one of the rising techniques used to increase well-being in the context of repetitive thoughts (Feldman, Greeson, & Senville, 2010).

The concept and practice of mindfulness has gained tremendous interest from psychological research and clinical practice in the recent decades (Pickert, 2014). Scientific publications and general media have given continuous positive reports on the benefits of mindfulness. This might be attributed to the proven effect of mindfulness practices and

mindfulness-based clinical interventions in the promotion of physical and mental well-being and the treatment of various psychological disorders. Research has found that mindfulness practices can reduce stress (Khoury, Sharma, Rush, & Fournier, 2015), depression (Williams, 2008) and anxiety (Evans et al., 2008). It was also found to prevent relapse of many psychological disorders (Chiesa & Serretti, 2011; Piet & Hougaard, 2011; Witkiewitz, Marlatt, & Walker, 2005) and promote general health and well-being (Greeson, 2008; Brown & Ryan, 2003). Since mindfulness allows the person to focus on the present moment experiences while opening up to all thoughts, feelings, and sensations non-judgmentally, it can tackle unhelpful thought processes such as rumination (Querstret & Cropley, 2013). Although vast amount of research has been published on the direct effects of mindfulness in the prevention and treatment of mental illnesses, little is known on its moderating role on the relationship between two important factors related to these problems: regret and rumination.

The purpose of the current study aimed to explore the moderation effect of mindfulness on the relationship between rumination and regret. Rumination and regret have been topics of interest in the past decade due to their relevance with depressive symptoms and negative outcomes. Some past research around these two topics have found a circular relationship, where rumination can increase regret as well as vice versa. The main purpose of this study was not to question this relationship, but to examine how mindfulness can affect it. We examined regret as a dependent variable in this study because we were interested in whether mindfulness was able to reduce regret specifically. Mindfulness, interpreted as a cognitive aspect, has been shown to influence negative thinking as an intervention of negative affect. Following the implied correlations, it would seem that mindfulness may be able to influence the relationship between

rumination and regret. The use following this rationale was thus to see whether mindfulness may aid in reducing regret by influencing the cognitive aspect of negative thinking, which is rumination. Since regret may be a factor that put university students at risk of suicide, it would be beneficial to understand the relationships between regret, rumination, and mindfulness as it may be possible to help reduce and prevent the negative consequences.

Literature Review

Rumination

Definition. Rumination has been defined in a similar yet distinctly different manner throughout previous research. One of the first definitions given was by Rippere (1977), who gave a general statement that rumination was a repetitive and persistent depressive thinking process that commonly stems from negative affect. As the development of depression became a growing concern, this link between rumination and depressive thinking was further studied, and more comprehensive definitions were created to describe rumination. Martin and Tesser further defined rumination as the recurring thoughts that are not dependent upon direct external cues, though indirect cues may play a role in maintaining the recurrent thought process (as cited in Papageorgiou & Wells, 2004). However, this definition does not directly mention closely related factors such as depression that was the original motivation for further study of rumination.

One of the bigger contributors in rumination research, Nolen-Hoeksema (1991), defined rumination as a function relating to depression where one repetitively and passively think about the cause, meaning, and consequence of their depressive symptoms. However, some of Nolen-Hoeksema's research on the measurement of rumination led to criticisms about the overlapping construct between rumination, depression, and worry (Smith & Alloy, 2009). Since then, other

researchers have tried to define rumination in more contextual terms. Conway, Csank, Holm, and Blake (2000), for example, saw rumination as repetitive thoughts pertaining to current situation contributing to one's distress and sadness. Researchers such as Alloy and colleagues have also made extensions to Nolen-Hoeksema's definition by adding a stress-reactive component, described as one's tendency to ruminate in response to stressful life events. This is distinct from other definitions because it suggests that rumination occurs before affect or depressive mood (Papageorgiou & Wells, 2004). An interesting addition to these definitions is the subtypes of rumination. Rumination was found to have two subtypes: brooding and reflection. Brooding rumination was found to be related to the development of depressive symptoms over time and was considered as a maladaptive coping strategy while reflective rumination was indicated to be an adaptive strategy used to cope with negative affect (Burwell & Shirk, 2007; Treynor, Gonzalez, & Nolen-Hoeksema, 2003).

Based on these definitions from past researchers, it appeared that rumination has influence in many other factors in relation to affect. The link between rumination and distress of negative affect seemed to be well supported. After comparison of these different definitions, it seemed that Nolen-Hoeksema's (1991) definition of rumination with the further extension from Alloy and colleagues (Papageorgiou & Wells, 2004) would best fit the current research. The notion that rumination may be an important aetiology for depression (Alloy & Abramson, 1999) is an important consideration to be discussed later on in this research. Especially since this extension implies that rumination may be considered as a trait rather than as only a state that responds to affect. Moreover, the addition of brooding rumination (Burwell & Shirk, 2007; Treynor et al., 2003) consolidates the notion of a maladaptive rumination that is related to

negative affect such as depression and dysphoria. Thus, the current research defined rumination as the repetitive thought process that is characterised as brooding, self-focused, dwelling on the negatives and goal discrepancies, and having a tendency to increase negative affect, particularly about past or present events (Almeda & Kessler, 1998; Burwell & Shirk, 2007; Lyubomirsky & Nolen-Hoeksema, 1995; Nolen-Hoeksema, 2000; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008; Smith & Alloy, 2009; Treynor, Gonzalez, & Nolen-Hoeksema, 2003).

Models and processes. Rumination poses an interesting question to researchers. What is rumination, and what functions or effects does it have? Several researchers have examined the possible outcomes, and generally linked rumination to negative thinking and other negative affect disorders such as dysphoria (Lyubomirsky & Nolen-Hoeksema, 1995) and depression (Nolen-Hoeksema et al., 2008). Upon these findings, certain models arose in an attempt to explain rumination. The most prominent one is based on the researcher Nolen-Hoeksema (Smith & Alloy, 2009). In this model, the concept of rumination was based from the Response Styles Theory (RST), which indicated that rumination is in essence a mechanism in response to one's negative affect in order to make sense of it (Nolen-Hoeksema, 1991). Despite its popularity, however, this model has been criticized for its lack of relation to biological and cognitive processes. Its overlap with depression and worry was also critiqued. Another model that arose in extension of the RST was the Stress-Reactive Rumination (SRR) model (Robinson & Alloy, 2003). This model suggested that negative cognitive styles paired with SRR, the tendency to ruminate after a stressful event, led to an increased risk of developing depression. This was supported by a prospective study which found that this SSR model was able to predict major and hopelessness depressive episodes in terms of their onset, number, and duration (Robinson &

Alloy).

Other models have also been explored as research in rumination expands to other relating factors. The Rumination on Sadness model that was based from Conway et al.'s (2000) looked specifically on rumination and sadness. This was a good model that can predict sadness, but it was lacking in generalization to other related negative affects other than sadness, such as depression (Smith & Alloy, 2009). The Goal Progress Theory also presented another aspect of rumination. It fell in line with the definition developed by Martin and Tesser (as cited in Papageorgiou & Wells, 2004), where no motivation to resolve emotional distress was involved, but rather that rumination was a response to goal dissonance or failure to reach a goal (Smith & Alloy). Other models have been brought up as well, such as the Self-Regulatory Executive Functional theory and the Cognitive Emotional Regulation model, but these other models tend to have criticisms in overlapping constructs and make measurements of rumination difficult to obtain (Smith & Alloy).

Rumination and other factors. Within the RST, rumination was defined as having negative thinking, dwelling on mostly past and present events and the discrepancies between one's current and target goals (Smith & Alloy, 2009). With this definition, researchers have found relationships linking rumination with dysphoria, depression, and recently, aggression. As research continues, it also became increasingly important to distinguish rumination from other similarly related constructs.

Rumination and worry. One main construct commonly confused with rumination is worry. Rumination and worry has strikingly similar characteristics, such as being self-focused, repetitive, and pervasive in nature (Nolen-Hoeksema et al., 2008). However, some distinguishing

traits can separate rumination from worry. Rumination focuses more on the past or present, self-worth, meaning, and loss. On the other hand, worry focuses more on the future and anticipated threats (Nolen-Hoeksema et al.). Past research has also mainly considered rumination as a state characteristic, in response to a negative affect or event. However, with recent interpretations, rumination can also be considered as a trait in its stability of response to triggering events over time (Smith & Alloy, 2009). Further differences include how a study in a non-clinical sample found that when compared to worry, rumination was more past-oriented, less verbal in nature, showed less effort and confidence in problem solving, and less compulsion to act (Papageorgiou & Wells, 2004). Some of these distinctions also appear significant in major depressive disorder and panic disorder samples, where less confidence in problem solving and having a more past-orientation were differentiated in both samples while showing less effort to solve problems only differed in the panic disorder sample (Papageorgiou & Wells).

Rumination and dysphoria. Rumination is not only a negative affect that stands on its own; it also affects other areas of well-being. One of these areas is in emotions or affects, such as dysphoria. Dysphoria, a state of unease or dissatisfaction, has been studied with rumination and their effects to problem solving (Lyubomirsky & Nolen-Hoeksema, 1995). Results from this study found that rumination influenced dysphoric symptoms by that it exacerbated depressive thinking. This linked rumination with negative thinking, which was proposed to have led to self-doubts about one's abilities as well as enhance the magnitude of a problem. In turn, these thought patterns affect one's ability to solve problems. Ironically, the reasons for engaging in rumination were found to be related to a person's belief about its outcome. A person tended to ruminate if he or she believed that it would lead to a positive outcome or resolution (Papageorgiou & Wells,

2004). In a study by Lyubomirsky and Nolen-Hoeksema (1993), dysphorics felt that the induced rumination helped them gain insight towards their problems. However, if he or she picked up negative beliefs about the outcomes of rumination during that time, it could lead to depressive symptoms (Papageorgiou & Wells). Interestingly, if one removed rumination, dysphoric people showed signs of normal problem solving skills (Lyubomirsky & Nolen-Hoeksema, 1993). This implied not only that rumination has a strong influence on negative cognition and affect, but also the possibility that interventions toward rumination may also help others with affect disorders such as depression or anxiety.

Rumination and depression and anxiety. Depression is another disorder found to be related with rumination. Nolen-Hoeksema (2000) found that rumination may be able to predict depressive episodes in terms of new onsets and their chronicity, as well as some anxiety symptoms. It was also found that the tendency to ruminate was influenced by metacognitive beliefs as well, where a positive belief that rumination may help resolve one's distress could lead one to ruminate. However, if one's belief about rumination changed to a negative belief during this process, the outcome could lead to depression (Papageorgiou & Wells, 2004). This indicated how cognitive processes such as belief and rumination may influence the development of depression.

Another related study examined how rumination mediates the effects of shame on depression (Orth et al., 2006). This study was based on the aspect in rumination theory that rumination occurs when one perceives threat to one's fundamental need, such as the need to belong. An interesting finding in this study was in how the results distinguished between shame and guilt. While shame was found to have an effect on depression through rumination, guilt did

not. This was because guilt was a self-perception rather than other-perception of one's self, thus not leading to a threat in one's fundamental need (Orth et al.). Rumination was also found to mediate between unforgiveness and depressive symptoms in older adults (Ingersoll-Dayton et al., 2010). One of the results from a study by Ingersoll-Dayton et al. was how the perception of unforgiveness from others had a direct relationship with depressive symptoms in older adults. This is consistent with the implication that others' perception of oneself has an important relational role with depressive symptoms. A related and interesting point in this study was in how the authors defined unforgiveness towards oneself as regret. What was found was how self-unforgiveness, or regret, was indirectly related to depressive symptoms through rumination (Ingersoll-Dayton et al.).

Along with this association, other related factors were also found to be connected with rumination: negative thinking, reduced instrumental behaviour, and reduced social support (Nolen-Hoeksema et al., 2008). When rumination was paired with negative cognition, problem solving skills and self-confidence also decreased (Lyubomirsky & Nolen-Hoeksema, 1995). There has been challenges in interpreting the findings related to these relationships, such as inconsistent data on the relationship between rumination and regret in a predictive manner (Nolen-Hoeksema et al.). However, the gravity of these limitations may be attenuated due to the current study's focus on rumination having a correlational relationship with negative cognition and affect such as regret rather than having a predictive relationship. Moreover, it was not certain which type of rumination was measured more between brooding or reflection.

Rumination and aggression. Interestingly, aggression was also found to be related to rumination. In a study by Pedersen et al. (2010), self-focused rumination was compared to

provocation-focused rumination. The results showed similarities in angry affect, but differed in which state of aggression each rumination type affects. In the self-focused rumination, a mediation effect of self-critical affect and angry affect was found between self-focused rumination and displaced aggression. Results showed a significant beta value of 0.35 between self-focused rumination and self-critical negative affect, while self-critical and negative affect showed a significant positive correlation with displaced aggression with a beta value of 0.34, both with a p value of less than .05. On the other hand, provocation-focused rumination was found to only influence angry affect as well as aggressive action cognition and cardiovascular arousal. The key difference here is in how the self-focused rumination showed more cognitive and affect outcomes, while the provocation-focused rumination showed more tendencies to act and has influence over biological functions (Pedersen et al., 2010). This implied that although aggression is of a different nature than dysphoria and depression, it is still a negative affect that is influenced by rumination.

Rumination as a cognitive process. The relationships found between rumination and negative affect such as depression and aggression implied that rumination is fundamentally a cognitive process that can be influenced and modified. Cognitive-based modification, priming or modifying one's cognition to be neutral or brooding, has shown significant differences in rumination. Those with a self-focused mindset tend to brood and have more negative cognitions. When induced into negative biases, an increase in state rumination was found. Similar results were also found for those with depressive characteristics. The effects of the cognitive modifications were not long-term, but depended on recurring distributions across time and context (Hertel, Mar, Ferrari, Hunt, & Agrawal, 2014). The main characteristic of rumination

that was found to be of particular interest was in its self-focused characteristic. This led to the implication that cognitive-based therapy, such as mindfulness, may help reduce rumination and in turn aid in reducing depressive symptoms, depression relapse, and preventing depression in general (Nolen-Hoeksema et al., 2008). In addition, the distinction between brooding and reflection rumination in terms of coping strategies (Burwell & Shirk, 2007; Treynor et al., 2003) indicated that rumination, as a cognitive component, may have influence over negative affect after all.

Regret

Definition. Regret is one of the more complex negative emotions that arise after poor decisions have been made (Marcatto & Ferrante, 2008). People can feel regret both for having done something (action) and for failing to take certain actions or opportunities (inaction; Gilovich & Medvec, 1995). Depending on the field of research, different conceptualizations of regret have been proposed. One of the earliest conceptualizations of regret came from the field of economics. Based on this approach, regret was defined as the differences between the actual payoff and the highest possible payoff that could have been obtained had other routes have been taken (Schoeffler, 1962). Although regret usually implies events of the past, economists tend to study regret in future setting or ‘anticipated regret’ and look at its effect on decision making. Originally, it was thought that people make decisions based on anticipated utility and choose the option with the most value (Landman, 1987). However, because findings showed that people do take into account emotional outcomes, the traditional logic was violated (Gilovich & Medvec, 1995).

Forming the basis of the economic approach is the idea of ‘regret aversion’, whereby

people choose the option that allows them to minimize the possibility of future regret even if it means giving up on monetary profits (Gilovich & Medvec, 1995). This economic approach focused solely on the “outcome” and argued that without the feedback or knowledge about the result of either the chosen or unchosen alternatives, people would feel no regret (Gilovich & Medvec, 1995; Tsiros, 1998). Despite being utilized by many studies, this concept was too limited. It failed to take into account the decisional and behavioural components that lead to the unwanted outcome in the first place, as well as people’s capacity to “imagine” about alternatives (Gilovich & Medvec, 1995).

Filling in these gaps, the psychologists defined regret as a cognitively-based emotion and often referred to it as a counterfactual emotion, suggesting the relationship between regret and counterfactual thinking (CFT) (Gilovich & Medvec, 1995; Kahneman & Tversky, 1982; Nyklíček, Vingerhoets, & Zeelenberg, 2011). CFT is a cognitive process whereby people appraise and compare “what actually happened” to the imagined alternatives of “what might or could have happened” (Kahneman & Tversky, 1982). There are two types of CFT: upward and downward CFTs. While upward CFT involves the comparison between the reality and a better alternative, downward CFT involves comparing the reality to a worse alternative (Lee & Cotte, 2009). Regret in this line of research, was often described as an emotion that results from the process of an upward CFT (Marcatto & Ferrante, 2008).

It was suggested that the more salient or the easier it is to imagine about a more desirable option, the more intense the regret will be (Gilovich & Medvec, 1995). Although phrased differently, this definition of regret was used as the framework for many papers. For instance, Roese et al. (2009) who studied regret in relation to depression and anxiety has defined

regret as — a negative emotion colored by the inference that a personal action might have brought about a different, more desirable outcome”. Similarly, Marcatto and Ferrante (2008) described regret as —a counterfactual emotion that one experiences after realizing or imagining that a better outcome could have been obtained, had one decided differently”.

Beyond the general definition, there were also researchers who proposed a multidimensional model of regret (Connolly & Zeelenberg, 2002; Lee & Cotte, 2009).

According to the decision justification theory, regret is composed of two components, one of them being the quality of the outcome and the other one being the justification of the process leading up to the decision, in which unjustified decisions are experienced in the form of self-blame (Connolly & Zeelenberg, 2002). Although these two components sum up into the feeling of regret, they may vary independently (Connolly & Zeelenberg, 2002; Lee & Cotte, 2009).

According to the example given by Connolly and Zeelenberg (2002), a drunk person who has driven home safely may feel satisfied with the outcome but blames himself or herself on the hindsight for not choosing to use a taxi instead; after all, there was a high risk of getting into an accident by choosing to drive.

The definition of regret from the psychological perspective was used in this paper; there were three reasons for doing so. First of all, unlike the economic approach, psychological approach encompasses both the decisional and the outcome components, and also acknowledges people’s ability to imagine. Moreover, the fact that it links CFT to regret coincided with the aim of this paper which intended to focus on the underlying cognitive processes of regret. Lastly, this study was interested in regret as one whole emotional state and has no intention to separately elaborate on the differential elements which might affect regret intensity; hence, the

multidimensional model was disregarded. Therefore, in this research, regret was defined as a negative emotional state that tends to be experienced in situations of intrapersonal harm, when a person has realized that if he or she had decided or acted differently in the past, a better outcome could have been obtained (Berndsen, van der Pligt, Doosje, & Manstead, 2004; Marcatto & Ferrante, 2008). The reason why we as the researchers described regret as an intrapersonal emotion will be explained in the next section.

Regret and other factors.

Regret and guilt. Regret is often confused with the emotion of guilt, such that both are related to bad decisions and the feeling of responsibility for causing unwanted outcomes (Berndsen et al., 2004). Nonetheless, researchers who investigated these emotions within the context of intrapersonal and interpersonal harm suggested that they can be differentiated both conceptually and statistically. In a study using thought scenarios, average regret was shown to be significantly higher than guilt when the bad decision described caused harm to oneself rather than to others, and vice versa (Berndsen et al., 2004). Regret emphasizes broadly on one's "failure" in attaining the best result, but guilt on the contrary deals with actions that are perceived to be morally wrong and is related to the desire to be forgiven by the victim of those actions (Ben-Ze'ev, 2001; Roseman, Wiest, & Swartz, 1994). However, this is not to say that in situations of interpersonal harm there will be no regret at all.

Zeelenberg and Breugelmans (2008) found a contradicting result such that regret was equally induced in both situations of intrapersonal and interpersonal harm. Nevertheless, it has to be pointed out that Zeelenberg and Breugelmans (2008) only tested the condition under which regret and guilt will be elicited but they did not consider the effect of levels or the severity of the

consequences on the intensity of the induced emotions. Berndsen et al. (2004); on the other hand, found that while guilt increased with the levels of interpersonal harm, regret increased only with levels of intrapersonal harm. This suggested that although possibility exists for regret to be involved in both situations, the extent at which it varies weight more on the decisions and behaviours that result in harm to oneself. Moreover, a significant correlation was found between regret and guilt in the situation of interpersonal harm (Zeelenberg & Breugelmans, 2008); hence implying an overlap in the construct of the two emotions under this particular condition. Since this paper intended to measure the construct unique to regret, regret was defined as an intrapersonal emotion.

Regret and disappointment. Regret was also found to share similar characteristics with disappointment, an emotion that is also a result of bad decisions and upward CFT. Nevertheless, by letting participants fill out questionnaires after asking them to recall and appraise past emotional experiences, Frijda, Kuipers, and Ter Schure (1989) found that regret can be differentiated from disappointment by its high rating on the dimension of “self-agency”. It was shown that while disappointment involved blaming uncontrollable factors for the bad outcome, feeling powerless, and lacking the motivation to do anything, regret was related to the attribution of oneself as the cause of the event, thoughts on what one could have done differently, and the desire for another chance (Van Dijk & Zeelenberg, 2002; Zeelenberg et al., 1998a). These characteristics were reflected in the differences between counterfactual thought content that lead to regret and disappointment (Zeelenberg et al., 1998b). In a study by Zeelenberg et al. (1998b), participants were instructed to recall either a disappointing or a regretful personal experience and were asked to list counterfactual thoughts they had about what and how they wanted to undo the

event. Participants in the disappointment condition were shown to have more “situation-focused counterfactuals” such as how the test could have been easier (Zeelenberg et al., 1998b). On the contrary, participants in the regret condition reported more self-directed “behaviour-focused counterfactuals” such as how one could have studied harder (Zeelenberg et al., 1998b).

Effects of regret. Regret, although categorised as a negative emotion, does have its benefits. Regret aids learning process (Zeelenberg, 1999). By allowing people to associate bad decisions with negative feeling or unpleasantness, past mistakes would be better remembered; hence, people would be less likely to repeat the same mistake (Zeelenberg, 1999). In support of this, Camille et al. (2004) found that the experience of regret was linked to the activation of the orbitofrontal cortex, a brain region responsible for learning and planning, and also participants’ ability to choose a more advantageous option in a gambling game. Furthermore, regret functions as a warning sign indicating that something has to be attended to (Roese et al., 2009). Its aversive nature motivates people to fix and erase the cause of regret (Zeelenberg, 1999). Since regret involves mental simulations and thoughts about what one could have done differently to produce a better result, it also prepares an individual in case he or she encounter a similar situation in the future (Zeelenberg, 1999).

Nevertheless, despite the functions, regret that goes on unresolved could be maladaptive (Torges, Stewart, & Nolen-Hoeksema, 2008). Because regret is characterized by the perception of self as the cause of bad outcomes, it was found to be linked to the sense of responsibility, self-blame, and ultimately the desire to punish oneself (Connolly & Zeelenberg, 2002; Zeelenberg et al., 1998a). In a questionnaire-based study, regret was shown to be related to lower happiness and higher depression (Schwartz et al., 2002). Even after controlling for dispositional factors,

Pethtel and Chen (2014) found that life regret significantly predicted lower life satisfaction. Biologically, adults with high regret were shown to have higher stress as implied by greater cortisol secretion (Wrosch et al., 2007). Moreover, according to both quantitative and qualitative studies, regret appeared to be related to physical symptoms such as joint pain, stomachache and headache (Courvoisier et al., 2011; Wrosch et al., 2007).

Behaviorally, due to regret, medical staff reported having difficulty sleeping and felt less confident in their skills (Courvoisier et al., 2011). Sleepiness may further lead to fatigue, lower concentration, vigilance, worse cognitive processing which may go on to affect job performances, and just like a vicious cycle, contribute to more decision regret (Scott, Arslanian-Engoren, & Engoren, 2014). Conversely, Torges et al. (2008) observed better coping and adaptation after the loss of loved ones in people who were able to resolve bereavement related regret. This was demonstrated by the decrease in depression and anxiety, as well as better well-being in the long term (Torges et al., 2008). These findings pointed to the importance and the advantage in reducing the feeling of regret.

Rumination and Regret: The Circular Relationship

As previously stated, regret may happen as a motivator to correct a wrong, or as a learning experience for future reference (Zeelenberg, 1999). In doing so, this justification can reduce cognitive dissonance, and thus distress. However, when this is not resolved in a timely manner, rumination may occur (Lyubomirsky & Nolen-Hoeksema, 1993; Papageorgiou & Wells, 2004; Ingersoll-Dayton et al., 2010). As mentioned in the RST, one of the functions of rumination is to make sense of negative affect after a prolonged period of time (Nolen-Hoeksema, 1991). The repetitive nature of rumination was thought to serve the purpose of

figuring out the purpose of one choice over another alternative. However, rumination also has an influence on the negative affect. Prolonged rumination has been shown to exacerbate and perpetuate one's negative affect. Since regret is widely accepted as one of the negative emotions (Gilovich & Medvec, 1995), it is therefore expected to increase with rumination.

The relationship between rumination and regret may then be inferred as a circulatory one. While the creation of regret may lead to rumination, rumination may also perpetuate regret, which would lead to further rumination (Lyubomirsky & Nolen-Hoeksema, 1995; Almeda & Kessler, 1998). This cycle is indicative of the relationship between cognition and affect in how one is not independent, or merely a cause-effect, of the other. To support this notion, some studies found direct links from regret to rumination, $F(1, 149) = 12.78, p \leq .001$; specifically those who were able to resolve their regrets within six months after losing their loved ones were lower on rumination (Torges, Stewart, & Nolen-Hoeksema, 2008). Other studies have found correlations between them; repetitive thinking and regret was shown to be significantly positively correlated with a Pearson's r value of 0.41 (Roese et al., 2009). The finding that rumination can be modified through cognitive bias (Hertel et al., 2014) and that it may be an aetiology rather than only an effect of negative affects such as depression (Alloy & Abramson, 1999), implies the important role rumination plays as a cognitive process towards negative affect (Lyubomirsky & Nolen-Hoeksema, 1995; Almeda & Kessler, 1998; Orth et al., 2006; Ingersoll-Dayton et al., 2010). This role may also apply for similar negative affects such as anxiety and, more relevantly, regret.

This circular relationship points towards a negative pattern between cognition and emotion. One of the most effective interventions for dealing with negative patterns is through

cognitive means. Mindfulness, which can also be considered as a meta-cognition helps reduce negative thought patterns such as rumination by increasing understanding and allowing those thoughts to pass non-judgmentally (Williams & Kuyken, 2012). Thus, it may be inferred that mindfulness may also aid in reducing regret as an intervention through rumination. It would then follow that mindfulness would help reduce rumination, which would in turn help reduce the effects of regret.

Mindfulness

Definition. Mindfulness originated from Buddhist belief of Satipatthana Sutta, which involves being in the here and now and the remembrance of the changing self and the world to facilitate empathic connections with others and the environment (Brazier, 2013). In fact, mindfulness is considered one of the core components in Buddhist teaching. Mindfulness can be achieved through the practice of meditation which in its traditional context aims to achieve morality, virtue, compassion, wisdom (Shonin, Gordon, & Singh, 2015) and ultimately, liberation, to ending all personal suffering (Thera, 1962).

The concept of mindfulness was first popularized in the West by Jon Kabat-Zinn who invented mindfulness-based stress reduction program to assist people who experience both physical and psychological distress. According to Kabat-Zinn (1990), mindfulness is the awareness that result from attending purposefully to the present experiences, nonjudgmentally. Through time, the definition of mindfulness has been invented and reinvented to facilitate different research purposes. Mindfulness is viewed either as a state, a trait, or a set of skills and techniques (Brown, Ryan, & Creswell, 2007).

Another well accepted definition include Bishop's two-component model of mindfulness

(Bishop et al, 2004). The first component involves self-regulation of attention on present moment experience. Being conscious on the moment-to-moment experience allows one to pay attention to one's breath while also being able to detect incoming thoughts, feelings, or sensations. The self-regulated sustaining of attention to present moment experiences allows for the inhibition of secondary elaborative processes which therefore cease the loop of automatic and uncontrolled thoughts, which can lead to rumination. The second component involves having a curious, open, and accepting orientation toward those experiences. Mindfulness is not thought suppression. Instead it requires noticing the experiences then drawing back attention to the breath. As a result, more attentional resources were used for the current experiences. In essence, Bishop saw mindfulness as a self-regulation of attention that requires sustained-attention, attention switching, and the inhibition of elaborative processes. since mindfulness involves monitoring and control, it can be considered as a metacognition (Nelson, Stuart, Howard, & Cowley, 1999; Flavell, 1979).

Mindfulness as a trait. Although there are many different definitions of mindfulness, we believed it is best to conceptualize mindfulness as a psychological trait of being open, accepting, and non-judgmental of one's current moment experiences. Brown and Ryan (2003) regarded mindfulness as an inherent disposition. This meant that each individual possess different levels of mindfulness which is consistent through time and situations. This is possibly due to human's natural variation in the level of clarity and sensitivity of their thought processes. Some are more inclined to employ automatic response to a situation while others give more attention and awareness to their actions (Wallace, 1999). Using the Mindfulness Attention Awareness Scale (MAAS), Brown and Ryan were able to distinguish expert practitioner of Zen meditation with

the general adult population. Mindfulness score increased with the duration of meditation training across time as mindfulness is incorporated into one's inherent disposition, but was not related to the current practice of mindfulness (i.e., state mindfulness).

We acknowledged the different definitions of mindfulness; however, it was conceptualized as a trait for our research aim which saw mindfulness as an inherent ability that a person needs in order to tackle states of rumination and regret. In addition, mindfulness was regarded as a trait in the present research with the acknowledgement of the fact that it involves metacognitive ability, which is unique to individuals (Bishop et al, 2004). Metacognition is the core component which drives regret and rumination. Therefore, differences in trait mindfulness could lead to an alteration of metacognitive processes, which in turn could lead to a reduction in the states of regret and rumination.

Mindfulness-based interventions. Various mindfulness-based interventions have been invented to serve as an alternative method to modern medicine in the prevention and treatment of psychological illnesses and disorders. Evidence from studies using randomized controlled trials showed that mindfulness-based interventions such as mindfulness-based stress reduction (MBSR; Kabat-Zinn, 1982) and mindfulness-based cognitive therapy (MBCT; Segal, Williams, & Teasdale, 2002) not only helped reduce negative emotional states, it also helped reduce the likelihood of relapse of these illnesses and even improved the quality of life for both ill and healthy individuals (Gu, Strauss, Bond, & Cavanagh, 2015). These programs are widely used in clinical settings as well as in schools, organizations, prisons, hospitals, or regarded as a general mode of being for many people (Pickert, 2014).

Mindfulness and other factors.

Mindfulness and rumination. According to McLaughlin and Nolen-Hoeksema (2011), many mindfulness-based interventions were found to be effective in the treatment of anxiety and depression because it helped stop the process of rumination, which served as the main mechanism in the ongoing experience of these negative mental states. Trait mindfulness and rumination, in fact, were found to be highly correlated to each other, showing a strong negative relationship (Wilkinson & Goodyer, 2008). Borders, Earleywine, and Jajodia (2010) found a significant negative correlation between mindfulness and rumination with a Pearson's r value of -0.48 . A recent study by Gu, Strauss, Bond, and Cavanagh (2015) has also found that rumination and worry was found to be one of the most important mediators for the success of mindfulness-based interventions in the improvement of mental health outcomes. Bergomi, Strohle, Michalak, Funke, and Berking (2013) suggested that rumination is a normal human experience, which may become dysfunctional if uncontrolled. Mindfulness can allow the person to better handle and adapt to these negative emotion and lessen its impact on psychological health. Williams and Kuyken (2012) reasoned that mindfulness allows the individual to observe everything in their mind compassionately as they occur. However, instead of judging and reacting to them, the individual shifts his or her perspective to realize that his or her thoughts, feelings, and sensations are merely just what it is and might not hold a definite association with the self. The observed experiences are a separate entity; therefore, the individual is not required to step in and react to them. This allows the individual to be detached from the cycle, breaking the endless loop of negative thinking.

Mindfulness and regret. Regret as mentioned, is a cognitively-based emotion that arises when people think about and reflect on past events and sometime when trying to predict how much regret they would feel as a result of their future decisions (Gilovich & Medvec, 1995; Kahneman & Tversky, 1982). This implied that those who experience this negative emotion are people who tend to live in the past and future but not the present (Noonan, 2014). Moreover, regret was found to be related to the feeling of self-blame and self-punishment, where people hold themselves responsible for the bad outcomes that happened (Connolly & Zeelenberg, 2002; Zeelenberg et al., 1998a). Mindfulness on the other hand allows the person to focus on the present rather than things that are out of their control. Mindfulness practice of meditation helps draw awareness and attention to the present moment experiences, specifically to one's breath. All thoughts, feeling, and sensations; however, are allowed into one's attention without judgment (Kabat-Zinn, 1990). This allows the person to accept those experiences as it is and not obliged to react to them (Bishop et al., 2004). Furthermore, mindfulness practices let people understand their thoughts without linking it to the permanent self but to see it as a momentary passing event (Teasdale, Segal, & Williams, 1995). Although past research have yet to show the direct link between regret and mindfulness, knowing how both of these factors work, it is very likely that the trait of mindfulness would be able to reduce people's regret via the underlying mechanisms that work directly against one another.

Mindfulness and psychological distress. Many research has found that mindfulness practices lead to a reduction in anxiety and depression. A meta-analysis of 39 studies conducted by Hoffman, Sawyer, Witt, and Oh (2010) has shown that MBSR (Kabat-Zinn, 1982) and MBCT (Segal, Williams, & Teasdale, 2002), which are the main mindfulness based interventions used

in most studies predicted a reduction of anxiety and depression for both clinical and general population. In addition, these effects are relatively stable and long-term. Various neuroimaging techniques have also been incorporated into research on the relationship between mindfulness and psychological distress. In a study conducted by Farb et al. (2010), participants watched sad films while they were under functional magnetic resonance imaging scan (fMRI). Participants who went through MBSR training had less neural activity than the control group in different brain areas associated with emotions. These brain areas also showed different patterns prior and post the MBSR training. This showed that mindfulness may allow people to have higher ability to regulate their emotion, which is the root cause of distress. In another interesting study conducted by Kuyken et al. (2008), participants who were at risk of depressive relapse were assigned to undergo either an MBCT intervention or the usual antidepressant medication (ADM). Relapse rates were measured 15 months following the treatment. Result showed that MBCT were 13% more effective than ADM in reducing depressive symptoms and its associating psychological comorbid symptoms. In addition, 75% of those who discontinued their ADM showed a higher reported quality of life.

Theory and mechanism of mindfulness. Shapiro, Carlson, Astin, and Freedman (2006) proposed a theory of mindfulness, IAA, which involves three axioms or building blocks: intention, attention, and attitude. The first axiom, intention, involves having a sense of personal vision to the incorporation of mindfulness into one's life; that is, understands the purpose of mindfulness. The second axiom, attention, involves having the capacity to attend to or observe a moment-to- internal and external experiences. Attention includes having sustained attention on a particular object, switching of attention between objects, and cognitive inhibition of secondary

elaborative experiences. The third axiom, attitude, refers to the quality of awareness. This involves putting one 'heart' into the practice, or being kind and open to all experiences including the aversive. This allows for a non-judgmental attitude which is the core component of mindfulness. The IAA is a tri-axiomatic model, whereby the three axioms interact and influence each other. Together they create a re-perception of experiences, creating a shift in perspective, whereby one gains the ability to perceive internal experiences objectively rather than subjectively. Thoughts, feelings, and sensations no longer become an extension of the self. This allows one to observe experiences with more clarity as they naturally occur and pass away. Shapiro et al. (2006) hypothesized that multiple mechanisms are involved in this shift. They include self-regulation (i.e., stability to changes), values clarification (i.e., finding one's true value), cognitive-behavioral flexibility (i.e., being adaptive and not overly identified with one's experiences), and exposure (i.e., reduces avoidance and denial of difficult emotions).

Research Question

This research aimed to answer the question of how mindfulness can affect the relationship between rumination and regret. Specifically, we wanted to see whether mindfulness can reduce regret by acting on the process of rumination.

Hypotheses

1. There will be a significant positive correlation between rumination and regret.
2. There will be a significant negative correlation between mindfulness and regret.
3. There will be a significant negative correlation between rumination and mindfulness.
4. The relationship between rumination and regret will be significantly moderated by mindfulness, such that the negative correlation between them will be attenuated for

those who are high on mindfulness.

Samples & Variables

1. Samples used in this research are Thai undergraduate students from Chulalongkorn University.

2. Variables

a. Independent Variables

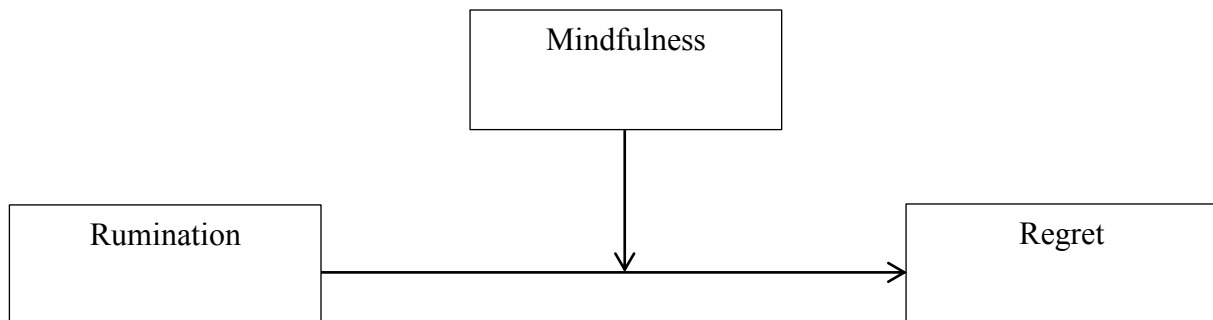
i. Rumination

ii. Mindfulness

b. Dependent Variable

i. Regret

Conceptual Framework



Operational definition

For the purpose of this research, the operational definition of each factor in this study has been drawn from a combination of the examined definitions for each factor.

1. Rumination is the repetitive thought process that is characterized as brooding, self-focused, dwelling on the negatives and goal discrepancies, and having a tendency to increase negative affect, particularly about past or present events (Lyubomirsky & Nolen-Hoeksema, 1995; Almeda & Kessler, 1998; Nolen-Hoeksema, 2000; Treynor,

- Gonzalez, & Nolen-Hoeksema, 2003; Burwell & Shirk, 2007; Nolen-Hoeksema et al., 2008; Smith & Alloy, 2009). Rumination will be measured by using the Thai version of the Response Styles Questionnaire (RSQ).
2. Mindfulness is a psychological trait of being open and accepting of one's thoughts, feelings, and sensations of the current moment without having a judgmental attitude towards its valence and the associating emotions (Bishop et al., 2004; Brown & Ryan, 2003). Mindfulness will be measured by using the Thai version of the Freiburg Mindfulness Inventory.
 3. Regret is a negative emotion that tends to be experienced in situation involving intrapersonal harm when a person has realized that if he or she had decided or acted differently in the past, a better outcome could have been obtained (Berndsen et al., 2004; Marcatto & Ferrante, 2008). Regret will be measured by using the Thai version of Breugelmans, Zeelenberg, Gilovich, Huang, and Shani's (2014) regret scale.

Expected Benefits

1. To understand the relationship between rumination and regret.
2. To understand the relationship of mindfulness on regret.
3. To expand on the understanding of rumination, regret, and mindfulness in Thai university students.

Chapter 2

Method

Participants

The sample and population was based on convenient sampling from a classroom at Chulalongkorn University. Based on Hair, Black, Babin, Anderson, and Tatham (2006) conceptual understanding of sample sizes, about 20 participants per group is needed to obtain a reliable outcome. This study collected data from 197 Thai undergraduate university students at Chulalongkorn University. Eight participants failed to answer all questions on the survey and were removed from analysis, leaving this study with a total of 189 participants. Participants were only of Thai or Asian ethnicity who are fluent in Thai language. Further demographic information can be seen in Table 8.

Measurements

In this correlational quantitative research, we used three measurements in Thai:

1. Response Styles Questionnaire (RSQ)
2. Mindfulness Inventory
3. Regret Scale

Rumination scale. The RSQ by Nolen-Hoeksema and Morrow (1991) as adapted by Siripanit, Manasveepongakul, and Ratanachatchuchai (2013) has 22 items (see Appendix A). The original items by Nolen-Hoeksema and Morrow were rated using a 4-point Likert Scale, where participants were asked to rate from 1 (almost never), to 4 (almost all the time) how much they agree with each statement, as in Table 1. Scores were calculated by calculating the mean score; there were no reverse items. Higher scores indicated higher frequencies of rumination.

Examples of items include “I think back to other times I have been depressed”, “I think about how hard it is to concentrate”, and “I go away by myself and think about why I feel this way”. This scale was preferred because it has already been translated into Thai language and has been tested with a Cronbach alpha of .90 (Siripanit et al., 2013), with an original Cronbach alpha of .89 in the original English scale (Nolen-Hoeksema & Morrow, 1991).

Table 1

Ratings in the RSQ

Frequency	Scoring/Rating
Almost never	1
Sometimes	2
Often	3
Almost all the time	4

The RSQ is compared to other rumination scales in Table 2. The Stress-Reactive Rumination Scale (SRRS) used by Alloy et al. (2000) was adapted from the RSQ, maintaining the 4-point Likert Scale format. This scale has a Cronbach alpha comparable to the RSQ. The Scott McIntosh Rumination Inventory (Scott & McIntosh, 1999) was used with Martin et al.’s Goal-Progress Theory (as cited in Papageorgiou & Wells, 2004) to measure rumination as a function of goal dissonance when one fails to accomplish their goal in a satisfactory manner. Among these three prominent measurements of rumination, the RSQ by Nolen-Hoeksema & Morrow (1991) was most consistent with the current study. This was because the definition used by Nolen-Hoeksema and Morrow was fairly consistent with the operational definition for rumination in this study. The improvement made by Alloy et al. seemed more of a state rather than trait measurement, since it required a stressful or negative life event before completing the

SRRS. The Scott McIntosh Rumination Inventory measures specifically for rumination in failure to reach a goal (Scott & McIntosh), which is not the type of rumination this study was interested in. The RSQ offers to measure the cognitive aspect of rumination that is consistent with the current study. It has also been widely used among Western researchers in the field of rumination, and has already been shown to have reliability within the targeted population, undergraduate students at Chulalongkorn University in Thailand (Siripanit et al., 2013), as well.

Table 2

Comparison of Rumination Scales

Study	Subjects	How Measured	Reliability
Nolen-Hoeksema & Morrow (1991); Siripanit et al. (2013)	Undergraduate students Thai Undergraduate students	Response Styles Questionnaire; 22 items; 4-point Likert scale format; –I think back to other times I have been depressed”, –I think about how hard it is to concentrate”, and –I go away by myself and think about why I feel this way”	.89; .90
Alloy et al. (2000)	Freshmen university students	Stress-Reactive Rumination Scale; degree of rumination about negative inferences to stressors; 25 items, nine subscales; 4-point Likert scale; rate items based on frequency of their negative thoughts and negative inferences for each item after a negative life event; "Think about what the occurrence of the stressor means about you" and –Think about how hard it is to concentrate”	.89
Martin et al. (1993); (Scott & McIntosh, 1999)	University students	Scott McIntosh Rumination Inventory; nine items, three subscales; 7-point Likert scale; –I often get distracted from what I'm doing by thoughts about something else” and –I rarely become 'lost in thought”	full scale .57-.60; subscales .66-.77

*Note: The SRRS was adapted from the RSQ

Mindfulness scale. Freiburg Mindfulness Inventory (Walach, Buchheld, Buttenmuller, Kleinknecht, & Schmidt, 2006) as adapted by Siripanit, Manasveepongsakul and Ratanachatchuchai (2013) was used in our study to measure mindfulness (see Appendix B). Mindfulness was assessed across four constructs which included: present-moment, non-judgemental towards self and others, openness to negative mind states, and process oriented insight understanding. The measure was composed of 14 scale items, including one reverse scored item, rated using a 4-point Likert Scale format from from 1(rarely) to 4 (almost always), as seen in Table 3. Examples of items included: I am open to the experience of the present moment; ‘ I accept unpleasant experiences. ‘

Table 3

Ratings on the Mindfulness Scale

Frequency	Rating/ Scoring
Rarely	1
Occasionally	2
Fairly Often	3
Almost Always	4

The measure was chosen for its validity and reliability in measuring mindfulness. With an internal consistency of Cronbach alpha =.93, it was able to discriminate the level of mindfulness between subjects who are experienced and new to meditation. In addition, it was the most appropriate measure of mindfulness in a generalized context. Therefore, it was most suitable to measure mindfulness in our definition, which was regarded as a trait. Freiburg Mindfulness Inventory (2006) is compared to other scales in Table 4.

Table 4

Comparison of Mindfulness Scales

Instrument name (Author)	Subjects	How Measured	Reliability (Internal consistency)
Five-facet mindfulness questionnaire (FFMQ; Baer et al., 2006)	Undergraduate students	5 facets; 39 items; 5-point Likert scale; e.g., <u>I</u> criticize myself for having irrational or inappropriate emotions. <u>I</u> am easily distracted.	0.84
Kentucky Inventory of Mindfulness Skills (KIMS; Baer et al., 2004)	Undergraduate students and sample of outpatients with borderline personality disorder	4 facets; 39 items; 5-point response scale; e.g., <u>I</u> disapprove of myself when I have irrational ideas. <u>I</u> 'm good at finding the words to describe my feelings.	0.80
Cognitive and Affective Mindfulness Scale Revised (CAMS-R; Feldman et al., 2006)	University students	4 facets; 12 items; 4-point Likert scale; e.g., <u>I</u> can tolerate emotional pain. <u>I</u> am able to accept the thoughts and feelings I have.	0.74
Southampton Mindfulness Questionnaire (SMQ; Chadwick et al., 2008)	Normal adult population and people with distressing psychosis	4 facets; 16 items; 6-point response scale; e.g., <u>I</u> judge myself as good or bad, depending on what the thought/image is about. <u>I</u> keep thinking about the thought/ image after it's gone.	0.80
Mindful Attention Awareness Scale (MAAS; Brown and Ryan, 2003)	Undergraduate students and general adult sample	Measure attentional aspect of mindfulness; 15 items; 6-point Likert scale; e.g., <u>I</u> find it difficult to stay focused on what's happening in the present. <u>I</u> rush through activities without being really attentive to them.	0.86

Freiburg Mindfulness Inventory (FMI; Walach et al., 2006)	General population and people with psychological disorders	Measure attention to present moment (presence) and non-judgemental attitude aspect of mindfulness; 14 items; 4-point response scale; e.g., <u>I</u> am open to the experience of the present moment. <u>I</u> accept unpleasant experiences.	0.83
Langer Mindfulness Scale (LMS; Bodner and Langer, 2001; Pirson et al., 2012)	American and Israeli Undergraduate students, university staffs, and general population	Measure novelty seeking, engagement, and novelty producing aspect of mindfulness; 14 items; 7-point response scale; e.g., <u>I</u> am very curious. <u>I</u> am rarely aware of changes.	0.82

Regret scale. To measure regret, five items were adopted from Breugelmans et al.'s (2014) regret scale (see Appendix C). Consistent with this paper theoretical framework, Breugelmans et al.'s regret scale viewed regret as a counterfactual emotion. Since the participants within this study are of Thai nationality, every item on the regret scale was translated from English into Thai language with the help of both English and Thai native speakers. Examples of the original items included “I thought that I had made a mistake” and “I wanted to correct my mistake”. The scale used a 6-point Likert Scale where participants were asked to rate from 0 (not at all) to 5 (very strongly) how much they agree with each statement (Table 5). The total score of this scale was averaged; a higher score indicated greater regret. The regret scale was shown to have a good internal consistency with a Cronbach's alpha value ranging between 0.80 and 0.86 across countries (Breugelmans et al, 2014).

Table 5

Rating on the regret scale

Agreement	Scoring/Rating
Not at all	0
Strongly disagree	1
Disagree	2
Neutral	3
Agree	4
Strongly agree	5

This scale was chosen for its good internal consistency and good discriminant validity. The scale was able to differentiate regret from disappointment and guilt on dimensions like specific emotional word, thought and attribution patterns, action tendencies, and motivational goals (Breugelmans et al., 2014). Moreover, the unique characteristics of regret as reflected in the items were shown to be generalizable across cultures (Western vs Eastern; Breugelmans et al., 2014). Unlike many other context specific regret scale, this scale is context-free and measures general state of regret; hence, its wide applicability. Furthermore, consistent with this study, the regret scale measured regret as a state of emotion and not as anticipated regret. Breugelmans et al.'s (2014) regret scale is compared to other regret scale in Table 6.

Table 6

Comparison of Regret Scales

Instrument Name (Author)	Subjects	Measurement	Reliability (Internal consistency)
Regret Scale (Breugelmans, Zeelenberg, Gilovich, Huang, & Shani, 2014)	Cross cultural university students	Used autobiographical recall to induce emotions and aimed to differentiate regret from disappointment and guilt across cultures; 5 items; 6-point Likert Scale; (0 = not at all to 5 = very strongly); e.g., <u>I</u> thought that I had made a mistake. <u>I</u> wanted to correct my mistake. <u>I</u>	.80 to .86
Anticipated Regret Scale (Sheeran & Orbell, 1999)	Citizens of the United Kingdom (UK) city, UK university students	Measure anticipated regret in the context of intention to play lottery; 2 items; 5- point Likert Scale (1 = strongly agree to 5 = strongly disagree); e.g., <u>If</u> I missed playing the national lottery for one week, I would regret it. <u>Not</u> playing the national lottery for one week would upset me. <u>I</u>	.83 to .96
Regret Scale (Clark et al., 2003)	Early prostate cancer patients	The scale was a part of a larger questionnaire that aimed to measure patients' experience of the treatment outcomes; 5 items; Likert Scale; e.g., <u>I</u> sometimes feel the treatment I had was the wrong one for me. <u>If</u> I had it to do over, I would choose some other treatment. <u>I</u>	.81
Regret and Disappointment Scale (Marcatto & Ferrante, 2008)	Undergraduate students	Used real-life scenarios to induce emotions and aimed to differentiate between the constructs of regret and disappointment; 2 items; 7- point Likert Scale (1 = not at all to 7 =	.64

		totally agree); e.g., <u>I</u> wish I had made a different choice.‘ <u>I</u> feel responsible for what happened to me.‘ There is a 3rd item which requires choosing between two counterfactual thoughts (regret vs disappointment)	
Regret Scale (Bui, Krishen, & Bates, 2011) *Modified from Tsiros’s (1998) original	Undergraduate students	Used purchase decision scenarios to induce emotion. The scale was a part of a larger questionnaire measuring consumers’ regret, rumination, and satisfaction in the context of post-purchase consumption behaviour. 3 items; 7-point Likert Scale; (1 = strongly disagree to strongly agree); e.g., <u>I</u> regret choosing to switch (not switch) brands.‘ <u>I</u> should have chosen the alternative laptop brand.‘	.87

Regret scale development.

1. In the process of regret scale development, five items from Breugelmans et al.’s (2014) Regret Scale were adopted. The original versions of the items were translated into Thai using by two Thai-English bilingual researchers using the back-translation method. One other Thai-English bilingual person then translated the Thai version back into English (see Appendix C).

2. An English native speaker was asked to go through the original and the back translated version of the scale. He commented on each back translated item’s content validity, and judged whether they still retained the meaning of the items in the original regret scale which they all did (see Appendix D).

3. To pilot test the Thai version of the regret scale, the items were made into an online survey. Eighty people were asked to complete the survey. To avoid an overlap between

participants in the pilot test and the actual experiment, only students from other universities beside Chulalongkorn University and students from Chulalongkorn University's faculty of psychology were recruited for this scale development phase.

4. To assess the items' quality, independent sample t-test was conducted to determine whether they can differentiate between people who experienced high and low regret. The step involved identifying the upper and lower groups as defined by 33 percent highest and lowest scorers based on the total score. Statistical analysis revealed that every item significantly differentiated between the two groups of people at the level of $p < .005$.

5. To establish the scale's reliability, its internal consistency or the assessment of how well the items measured the same construct was analyzed. Specifically, each item's corrected item-total correlation or CITC (see appendix F) and the scale's Cronbach's alpha, or averaged internal consistency were calculated. Results showed that each item on the Thai version of regret scale was reliable and that the scale as a whole was highly reliable ($\alpha = .82$).

Measurements Reliability

Internal reliability analysis showed that all of the measure used had moderate to high reliability as indicated by than Cronbach's Alpha values greater than .70. Specifically, while Rumination scale was highly reliable ($\alpha = .91$), Mindfulness scale ($\alpha = .75$) and the Regret Scale Regret scale ($\alpha = .78$) showed moderate reliability.

Table 7

Cronbach's Alpha of the Response Style Questionnaire, Mindfulness Inventory, and the Regret Scale

Measures	Cronbach's Alpha
1. Response Styles Questionnaire (RSQ)	.91
2. Mindfulness Inventory	.75
3. Regret Scale	.78

Regret scenario. The scenario which was used to induce regret was adopted from Berndsen, van der Pligt, Doosje, and Manstead (2004). In line with this research's view about regret, the scenario described a situation of intrapersonal harm and was shown to be able to elicit the emotion of regret (Berndsen et al., 2004). Moreover, the scenario involved academic related issue; therefore, it was believed to be relevant to this study university students sample. For comprehension, the scenario was translated from English into Thai using the back-translation method. Specifically, one English-Thai bilingual researcher translated the English version into Thai version and another English-Thai bilingual researcher translated that Thai version back into English. An English native speaker was then asked to comment on the back-translated version of the scenario (see Appendix D); appropriate adjustments were made according to the comments. The following is the original version of the scenario:

Imagine that you usually prepare for your exams together with friends. This time you do not want to do that. Your friends pass the exam, but you do not.

The following is the translated version of the scenario:

สมมุติว่า ปกติแล้วคุณเตรียมตัวสอบพร้อมกับเพื่อนของคุณ แต่ครั้งนี้คุณไม่ยอมและไม่ได้ไปเตรียมตัวสอบกับเพื่อน
เพื่อนๆ ของคุณสอบผ่าน แต่คุณไม่ผ่าน

Data Collection/Procedure

Data was collected through paper-and-pencil questionnaires. Participants were recruited through a classroom at Chulalongkorn University. The researchers used the class break time to hand out the surveys and to explain that this survey completion is voluntary. In this study, participant were asked to complete the questionnaire containing rumination and mindfulness scales that also included questions asking for the participants' age, gender, and which faculty they are from. After that, they were instructed to read a real-life scenario and then complete the regret scale. The order of scales presented on the questionnaire was counterbalanced to avoid order effect, resulting in a total of six versions. The six versions of the questionnaire were randomly distributed to the participants. Their participation in the data collection was fully voluntary as they were informed prior to the researchers handing out the survey. They were also informed through the information sheet attached to each survey explained that they are able to withdraw their consent or stop doing the survey at any time.

Statistical Analysis

The data collected was analyzed in the IBM SPSS statistical software version 20. The analysis included:

1. Descriptive analysis: Information about the mean, standard deviation, minimum, maximum, range, and the skewness.
2. Pearson's correlations between each main variable

3. Moderated Multiple Regression analysis: In this analysis, the variables were entered in a stepwise manner
 - a. The mean centered variables of Rumination and Mindfulness were entered into the equation at Step 1 and the interaction term between Rumination and Mindfulness at Step 2.
 - b. Simple Slope Analysis: Since the interaction was not significant, no simple slope analysis was done.

Chapter 4

Results**Demographics**

As depicted in Table 8, participants' demographic information of gender, age, academic year, grade point average (GPA), and faculty were collected. Of the 189 participants, 32 were male and 157 were female. Their age ranged from 18 to 23 years old. The majorities of the participants were in their freshman year and were from faculties under the field of Science and Technology. Their GPA mostly fell in the range from 3.01 to 3.50. Data from the descriptive statistical analysis (table 9) showed that while variables of rumination and mindfulness were normally distributed, regret was negatively skewed. The skew was fixed after square root was applied. However, because of the negative skew, the variable of regret had to be reflected before applying square root (Princeton University Library, 2007); therefore, all of the relationship to regret in this study has to be interpret in reverse direction to the original variable.

Table 8

Demographic frequencies

		Frequency	Percent
Gender	Male	32	16.9
	Female	157	83.1
	Total	189	100.0
Age	18	14	7.4
	19	57	30.2
	20	45	23.8
	21	40	21.2
	22	25	13.2

		Frequency	Percent
23		8	4.2
Total		189	100.0
Year	1	64	33.9
	2	52	27.5
	3	35	18.5
	4	35	18.5
	5	2	1.1
	6	1	.5
Total		189	100.0
GPA	less than 2.00	7	3.7
	2.01-2.50	31	16.4
	2.51-3.00	46	24.3
	3.01-3.50	67	35.4
	3.51-4.00	38	20.1
Total		189	100.0
Faculty	Social and Humanities	71	37.6
	Sciences		
	Science and Technology	110	58.2
	Sciences		
	Health Science	8	4.2
Total		189	100.0

Pearson's Correlation

Pearson's correlation was conducted to analyse the associations between variables of rumination, mindfulness, and regret. As indicated in table 9 and table 10, while regret ($M = 1.13$, $SD = 0.40$) was significantly positively correlated to rumination ($M = 2.11$, $SD = 0.48$), $r(189) = .21$, $p = .004$; regret was not significantly correlated to mindfulness ($M = 2.89$, $SD = 0.37$), $r(189) = -.10$, $p = .180$. This indicated that people who ruminate more were also more likely to experience greater regret. Rumination was shown to be significantly negatively correlated to mindfulness $r(189) = -.41$, $p < .001$, suggesting that people who were higher in rumination were more likely to be low on mindfulness.

Table 9

Descriptive statistics on Regret, Rumination, and Mindfulness

	M	Minimum	Maximum	SD	Skewness
Regret	3.57	0.20	5.00	0.88	-1.09
Regret*	1.13	0.00	2.19	0.50	-0.38
Rumination	2.11	1.14	3.59	0.48	0.42
Mindfulness	2.88	1.79	3.93	0.37	-0.38

*after applying the square root transformation

Table 10

Correlational Table between Regret, Rumination, and Mindfulness and Cronbach's Alpha values of each scale

	M	SD	Regret	Rumination	Mindfulness
Regret	1.13	0.50	.78	-	-
Rumination	2.11	0.48	.21**	.91	-
Mindfulness	2.88	0.37	-.10	-.41**	.75

** $p < .01$, one-tailed

Moderated Multiple Regression

A moderated multiple regression analysis with criterion of regret and predictors of rumination, mindfulness, and their interaction were performed. Rumination and mindfulness were entered in Step 1 while the interaction was entered in Step 2. This is to determine any additional variance made by only the interaction that is over and above the direct main effects of rumination and mindfulness. To reduce multicollinearity, rumination and mindfulness were mean-centered. Their interaction was the product of the mean centered value of rumination and mindfulness. As shown in table 11, the multicollinearity was not a problem here. The tolerance levels of all variable were over .1 and the Variance Inflation Factor (VIF) values were all below 10, indicating that it was appropriate for multiple regression to be conducted.

Table 11

Tolerance and VIF Value for Independent Variables

Independent Variables	Collinearity Statistics	
	Tolerance	VIF
Rumination	.81	1.24
Mindfulness	.81	1.24
Interaction	.91	1.11

In Step 1 of the model, 4.5% of the variance in regret was explained by the combined direct effect of rumination and mindfulness, $\Delta F(2, 186) = 4.34, p = .014$. Individually, rumination significantly accounted for 3.5% of the variance in regret, where higher rumination indicated higher regret, $\beta = .21, p = .010$. Mindfulness individually accounted for 0% of the variance of regret, $\beta = -.01, p = .859$. Shared variance between rumination and mindfulness

explained for 1% of regret variance. In Step 2 of the model, 0.9% of the variance was accounted for by a non-significant interaction, $\Delta F(1, 185) = 1.83$, $\beta = .10$, $p = .177$ (see Table 12).

Table 12

Moderated Multiple Regression Analysis Table for Predicting Variables and Regret

Model	Independent Variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.13	.028		39.91	.000
	Rumination	.17	.065	.21	-2.61	.010
	Mindfulness	-.02	.085	-.01	.18	.859
2	(Constant)	1.12	.03		37.78	.000
	Rumination	.19	.07	.22	-2.82	.005
	Mindfulness	-.03	.09	-.03	.40	.689
	Interaction	.17	.12	.10	-1.35	.177

*Note: $R^2 = .045$ (for model 1); $R^2 = .054$ (for model 2 with interaction)

Table 13

Results summary for the five hypotheses

Hypotheses	Results
1. There will be a significant positive correlation between rumination and regret.	<u>Supported</u> $r(189) = .21, p = .004$, two tailed
2. There will be a significant negative correlation between mindfulness and regret.	<u>Not Supported</u> $r(189) = -.10, p = .180$, two tailed
3. There will be a significant negative correlation between rumination and mindfulness.	<u>Supported</u> $r(189) = -.41, p < .001$, two tailed
4. The relationship between rumination and regret will be significantly moderated by mindfulness, such that the negative correlation between them will be attenuated for those who are high on mindfulness.	<u>Not supported</u> $R^2 = .054, p = .177$ $\beta = -.10, p = .177$

Chapter 4

Discussion

Regret was found to be associated to various health consequences and has been implied to be a contributing factor to university students' educational stress (Hamaideh, 2009; Kinnier & Metha, 1989; Lecci et al., 1994; Scelfo, 2015). It is therefore of importance to understand regret and the factors influencing it. The aim of this study was to examine the relationship between rumination, regret, and mindfulness. In terms of correlation, we hypothesized that rumination and regret would be positively correlated, regret and mindfulness would be negatively correlated, and rumination and mindfulness would be negatively correlated. For the regression, we hypothesized that there would be an interaction in which mindfulness would moderate the relationship between rumination and regret, such that mindfulness would attenuate their relationship. Mixed results were produced in relation to past literature and the main hypotheses.

Hypothesis I: There will be a significant positive correlation between rumination and regret.

Results: Hypothesis was supported

Consistent with the first hypothesis, the result showed that people who have a high level of rumination will also have a high level of regret. Specifically, students who experienced higher regret about their bad decision, in this case, not joining a study group which cost them their grades, were more likely to experience rumination. The result was supported by several studies which found that rumination was a factor strongly related factor to regret (Ingersoll-Dayton et al., 2010; Lyubomirsky & Nolen-Hoeksema, 1993; Papageorgiou & Wells, 2004). A past study conducted by Marcatto & Ferrante (2008) stated that when one regrets about events that turned

out to be unsatisfactory to them, either as a result of poor decision or inaction, they would be more inclined to engage in rumination in order to make sense of the situation. In other words, rumination occurs when one tries to get rid of the discomforting feeling of regret by comparing the actual event that happened to an imagined better alternative (Lyubomirsky & Nolan-Hoeksema, 1993).

Hypothesis II: There will be a significant negative correlation between mindfulness and regret.

Results: Hypothesis was not supported

Although inconsistent to the second hypothesis, the non-significant statistical result could imply ambiguous relationship of regret and mindfulness among our samples. Participants who showed high regret did not show low levels of mindfulness. Therefore, this hypothesis was not supported. This is inconsistent with what previous literature have been suggesting. According to past research, regret, as mentioned, is a cognitive reflection of past event or prediction of how they would feel in the future (Kahneman & Tversky, 1982). This definition is the contrary to mindfulness, which allows one to stay in the present moment and without judgement of thoughts (Kabat-Zinn, 1990). In addition, people higher on mindfulness trait are more accepting of their experiences and less likely to react to them. Therefore, the opposing characteristics between regret and mindfulness made it unlikely for people with higher level of mindfulness to show high level of regret as a response to a certain situation (Noonan, 2014). The nonsignificant result found might be attributable to issues relating to the regret scale. Since the scale did not show as much reliability and validity as previous studies have shown (Breugelmans et al., 2014; Huang & Shani, 2014), this might led to a reduced significance level. The marked reliability of one item in

particular was brought into question. It should also be noted that Breugelmans et al.'s (2014) study does not include Thai sample.

Hypothesis III: There will be a significant negative correlation between rumination and mindfulness.

Results: Hypothesis was supported

In addition, consistent to the third hypothesis, the result showed that students with high rumination showed lower levels of mindfulness. This is in agreement with what past research suggested. According to Wilkinson and Goodyer (2008), rumination and mindfulness are highly correlated to each other, showing a strong negative relationship. In fact, most mindfulness-based interventions work on the premise that psychological distress could be reduced if rumination can be control (McLaughlin and Nolen-Hoeksema, 2011; Gu et al., 2015). It has been shown that rumination responds positively to interventions relating to mindfulness (Feldman et al., 2010; Querstret & Cropley, 2013). Although rumination is a normal experience, it can become dysfunctional when it could not be control (Bergomi et al., 2013). Mindfulness allows one to observe thoughts non-judgmentally and compassionately as they occur (Williams & Kuyken, 2012). Since these negative thoughts do not become part of a self-concept, it possible for one to detach themselves from rumination.

Hypothesis IV: The relationship between rumination and regret will be significantly moderated by mindfulness, such that the negative correlation between them will be attenuated for those who are high on mindfulness.

Results: Hypothesis was not supported

Inconsistent to the study's fourth hypothesis, the results show that mindfulness had no significant interaction or attenuating effects to the relationship between rumination and regret. Therefore, the hypothesis was not supported. This may be because our sample size is relatively small compared to other studies using a moderating model (Siripanit et al., 2013), which might have reduced the statistical power to detect an interaction effect.

Limitations

There are several limitations to the study. First the sample size in this study is relatively small as compared to other studies within this area. Comparing to Siripanit et al.'s (2013) paper on the moderating effect of mindfulness on rumination and anxiety which has 275 participants, the number of participants in our study is relatively small. This might have reduced our statistical power and led to our partially supported results. Second, time limitation has prevented us from conducting an elaborative factor analysis on the development of regret scale in Thai population. This might have led to an oversight on how the scale might not be valid for measuring regret in Thai population. Third, regret is a relatively new construct globally and very new in Thailand. The regret scale used in this study has not been used in a Thai population before; the use of the current regret scale may not be the most suitable for participants within Thailand without further validation. Item 5 in the regret scale had shown a marked difference in statistical output from the rest of the items in the regret scale. The reliability analysis for the pilot test has shown that item 5

has substantially lower CITC value despite being above the critical r value of 0.232. Item 5 asked about one's sense of responsibility towards the scenario. In a full research, since we were using a scale on a new population, a factor analysis was required; however, due to the time limitation of this study, we were unable to do so. Therefore, theories on its mechanisms and processes might not be perfectly reliable. The second and third limitations were both considered important factors in limiting the results of our study.

Future Research

There are several points that future research could work on to improve upon this research. Future research should aim to include a larger number of participants in order to increase statistical power. In addition, research should be time conscious; it should be conducted without time constrictions in order to be able to conduct elaborative factor analysis on the development of each scale in the new population. Moreover, future research should further examine the validity and reliability of Breugelmans et al.'s (2014) regret scale in Thai population, in order to have a better understanding of how the scale works in a new context. We suggest that factor analysis should be performed in order to better understand the relationships between items on the measure used, how they uniquely contribute to the result, and how they relate to one another. Future research can also extend beyond the dimension of this study and explore how state mindfulness plays a role on rumination and regret, in order to extend their suggestion of implications beyond what the current research is capable of.

Theoretical and Practical Applications

This research has several theoretical implications on the relationship between rumination, regret, and mindfulness. It reaffirmed the findings from previous literature that rumination and

mindfulness are negatively correlated, which suggested that people who have a lower level of rumination would be more likely to possess a higher level of trait mindfulness. It also revealed that this relationship is present not only in Western populations (Wilkinson & Goodyer, 2008), but also in Thai population, specifically in university students. Similarly, it reaffirmed previous findings that rumination and regret are positively correlated, such that those who experienced a higher level of rumination would experience greater feelings of regret, in both Western and Thai university students. Our knowledge of the relationship between rumination, mindfulness, and regret in Thai university students has increased; the findings expanded an understanding of the relationship between rumination and regret with mindfulness as a moderating factor by exploring the links within the contexts of the Thai university students. Although the moderating role of mindfulness on the relationship between rumination and regret was not found, a key factor that might have contributed to this finding appeared to be the concept of one's sense of responsibility used in the current regret scale. This concept seemed to have some differences between Western and Eastern populations, especially within the South East populations.

In practical applications, this study has shown the importance of mindfulness in reducing rumination, which may eventually lower one's sense of regret. Although result was not significant, the additional analyses conducted in the present study had revealed a tendency for mindfulness to attenuate the relationship between rumination and regret in Thai university students. As a preventive measure against dysfunctional cognitive patterns, universities may encourage students to be more mindful. The implied benefit would not only come from mindfulness directly, but also through the reduced stress from rumination. Since rumination was

related to regret, the reduction effect from mindfulness was theoretically discussed to also influence regret as well.

References

- Alloy, L. B. & Abramson, L. Y. (1999). The temple-wisconsin cognitive vulnerability to depression (CVD) project: Conceptual background, design and methods. *Journal of Cognitive Psychotherapy: An International Quarterly*, *13*, 227–262. doi:10.1037//0021-S43X.109.3.403
- Alloy, L. B., Abramson, L. Y., Hogan, M. E., Whitehouse, W. G., Rose, D. T., Robinson, M. S., Kim, R. S., & Lapkin, J. B. (2000). The Temple-Wisconsin cognitive vulnerability to depression project: Lifetime history of axis I psychopathology in individuals at high and low cognitive risk for depression. *Journal of Abnormal Psychology*, *109*(3), 403-418. doi:10.1037//0021-S43X.109.3.403
- Almeda, D. M., & Kessler, R. C. (1998). Everyday stressors and gender differences in daily distress. *Journal of Personality and Social Psychology*, *75*(3), 670-680. doi:10.1037//0022-3514.75.3.670
- Baer R. A., Smith G. T., Allen K. B. (2004). Assessment of mindfulness by self-report: The Kentucky inventory of mindfulness skills. *Assessment* *11* 191–206. doi:10.1177/1073191104268029
- Baer R. A., Smith G. T., Hopkins J., Krietemeyer J., Toney L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment*, *13*, 27–45. doi:10.1177/1073191105283504
- Ben-Ze'ev, A. (2000). *The subtlety of emotions*. Cambridge, Mass: MIT Press.

- Bergomi, C., Ströhle, G., Michalak, J., Funke, F., & Berking, M. (2013). Facing the dreaded: Does mindfulness facilitate coping with distressing experiences? A moderator analysis. *Cognitive Behaviour Therapy, 42*(1), 21-30. doi:10.1080/16506073.2012.713391
- Berndsen, M., van der Pligt, J., Doosje, B., & Manstead, A. (2004). Guilt and regret: The determining role of interpersonal and intrapersonal harm. *Cognition & Emotion, 18*(1), 55-70. doi:10.1080/02699930244000435
- Bishop, S. R., Lau, M., Shapiro, S., Carlson, L., Anderson, N. D., Carmody, J., ... & Devins, G. (2004). Mindfulness: A proposed operational definition. *Clinical Psychology: Science and Practice, 11*(3), 230-241. doi:10.1093/clipsy.bph077
- Brazier, C. (2013). Roots of mindfulness. *European Journal of Psychotherapy & Counseling, 15*(2), 127-138. doi:10.1080/13642537.2013.795336
- Breugelmans, S. M., Zeelenberg, M., Gilovich, T., Huang, W., & Shani, Y. (2014). Generality and cultural variation in the experience of regret. *Emotion, 14*(6), 1037-1048. doi:10.1037/a0038221
- Bodner T., Langer E. (2001). "Individual differences in mindfulness: the mindfulness/mindlessness scale," in *Poster Presented at the 13th Annual American Psychological Society Conference Toronto, ON*
- Borders, A., Earleywine, M., & Jajodia, A. (2010). Could mindfulness decrease anger, hostility, and aggression by decreasing rumination?. *Aggressive Behavior, 36*(1), 28-44. doi: 10.1002/ab.20327

- Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology, 84*(4), 822. doi:<http://dx.doi.org/10.1037/0022-3514.84.4.822>
- Brown, K. W., Ryan, R. M., & Creswell, J. D. (2007). Mindfulness: Theoretical foundations and evidence for its salutary effects. *Psychological Inquiry, 18*(4), 211-237. doi:10.1080/10478400701598298
- Bui, M., Krishen, A. S., & Bates, K. (2011). Modeling regret effects on consumer post-purchase decisions. *European Journal of Marketing, 45*(7/8), 1068-1090. doi:10.1108/03090561111137615
- Burwell, R. A., & Shirk, S. R. (2007). Subtypes of rumination in adolescence: Associations between brooding, reflection, depressive symptoms, and coping. *Journal of Clinical Child and Adolescent Psychology, 36*, 56-65. doi:10.1080/15374410709336568
- Camille, N., Coricelli, G., Sallet, J., Pradat-Diehl, P., Duhamel, J., & Sirigu, A. (2004). The involvement of the orbitofrontal cortex in the experience of regret. *Science, 304*(5674), 1167-1170. doi:10.1126/science.1094550
- Chiesa, A., & Serretti, A. (2011). Mindfulness based cognitive therapy for psychiatric disorders: a systematic review and meta-analysis. *Psychiatry Research, 187*(3), 441-453. doi:10.1016/j.psychres.2010.08.011
- Clark, J. A., Bokhour, B. G., Inui, T. S., Silliman, R. A., & Talcott, J. A. (2003). Measuring patients' perceptions of the outcomes of treatment for early prostate cancer. *Medical Care, 41*(8), 923-936. doi:10.1097/00005650-200308000-00006

- Connolly, T., & Zeelenberg, M. (2002). Regret in decision making. *Current Directions in Psychological Science, 11*(6), 212-216. doi:10.1111/1467-8721.00203
- Conway, M., Csank, P. A., Holm, S. L., & Blake, C. K. (2000). On assessing individual differences in rumination on sadness. *Journal of Personality Assessment, 75*(3), 404-425. doi:10.1207/S15327752JPA7503_04
- Courvoisier, D. S., Agoritsas, T., Perneger, T. V., Schmidt, R. E., & Cullati, S. (2011). Regrets associated with providing healthcare: Qualitative study of experiences of hospital-based physicians and nurses. *PLoS One, 6*(8), e23138. doi:10.1371/journal.pone.0023138
- Davis, D. M., & Hayes, J. A. (2011). What are the benefits of mindfulness? A practice review of psychotherapy-related research. *Psychotherapy, 48*(2), 198. doi:http://dx.doi.org/10.1037/a0022062
- Evans, S., Ferrando, S., Findler, M., Stowell, C., Smart, C., & Haglin, D. (2008). Mindfulness-based cognitive therapy for generalized anxiety disorder. *Journal of Anxiety Disorders, 22*(4), 716-721. doi:10.1016/j.janxdis.2007.07.005
- Farb, N. A. S., Anderson, A. K., Mayberg, H., Bean, J., McKeon, D., & Segal, Z. V. (2010). Minding one's emotions: Mindfulness training alters the neural expression of sadness. *Emotion, 10*, 25-33. doi:10.1037/a0017151.supp
- Feldman, G., Greeson, J., & Senville, J. (2010). Differential effects of mindful breathing, progressive muscle relaxation, and loving-kindness meditation on decentering and negative reactions to repetitive thoughts. *Behaviour Research and Therapy, 48*(10), 1002-1011. doi:10.1016/j.brat.2010.06.006

- Feldman G., Hayes A., Kumar S., Greeson J., Laurenceau J.-P. (2006). Mindfulness and emotion regulation: the development and initial validation of the cognitive and affective mindfulness scale-revised (CAMS-R). *J. Psychopathol. Behav. Assess.* 29, 177–190. doi:10.1007/s10862-006-9035-8
- Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive-developmental inquiry. *American Psychologist*, 34(10), 906. doi:http://dx.doi.org/10.1037/0003-066X.34.10.906
- Frijda, N. H., Kuipers, P., & ter Schure, E. (1989). Relations among emotion, appraisal, and emotional action readiness. *Journal of Personality and Social Psychology*, 57(2), 212-228. doi:10.1037/0022-3514.57.2.212
- Gilovich, T., & Medvec, V. H. (1995). The experience of regret: What, when, and why. *Psychological Review*, 102(2), 379-395. doi:10.1037/0033-295X.102.2.379
- Greeson, J. M. (2009). Mindfulness research update: 2008. *Complementary Health Practice Review*. doi:10.1177/1533210108329862
- Gu, J., Strauss, C., Bond, R., & Cavanagh, K. (2015). How do mindfulness-based cognitive therapy and mindfulness-based stress reduction improve mental health and wellbeing? A systematic review and meta-analysis of mediation studies. *Clinical Psychology Review*, 37, 1-12. doi:10.1016/j.cpr.2015.01.006
- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate Data Analysis* (Vol. 6). Upper Saddle River, NJ: Pearson Prentice Hall
- Hamaideh, S. H. (2009). Stressors and reactions to stressors among university students. *International Journal of Social Psychiatry*. doi:10.1177/0020764009348442

- Hertel, P. T., Mar, N., Ferrari, C., Hunt, O., & Agrawal, N. (2014). Looking on the dark side: Rumination and cognitive-bias modification. *Clinical Psychological Science*, 2(6), 714-726. doi:10.1177/2167702614529111
- Hoffman, S. G., Sawyer, A. T., Witt, A. A., & Oh, D. (2010). The effect of mindfulness-based therapy on anxiety and depression: A meta-analytic review. *Journal of Consulting and Clinical Psychology*, 78, 169–183. doi:10.1037/a0018555
- Ingersoll-Dayton, B., Torges, C., & Krause, N. (2010). Unforgiveness, rumination, and depressive symptoms among older adults. *Aging & Mental Health*, 14(4), 439-449. doi:10.1080/13607860903483136
- Kabat-Zinn, J. (1982). An outpatient program in behavioral medicine for chronic pain patients based on the practice of mindfulness meditation: Theoretical considerations and preliminary results. *General Hospital Psychiatry*, 4(1), 33-47. doi:10.1016/0163-8343(82)90026-3
- Kabat-Zinn, J. (1990). Full catastrophe living: Using the wisdom of your body and mind to face stress, pain, and illness. Bantam Doubleday Dell Publishing Group. *New York, New York*.
- Kahneman, D., & Tversky, A. (1982). The simulation heuristic. In D. Kahneman, P. Slovic, & A. Tversky (Eds.), *Judgment under uncertainty: Heuristics and biases* (pp. 201–208). New York: Cambridge Univ Press.
- Khoury, B., Sharma, M., Rush, S. E., & Fournier, C. (2015). Mindfulness-based stress reduction for healthy individuals: a meta-analysis. *Journal of Psychosomatic Research*, 78(6), 519-528. doi:10.1016/j.jpsychores.2015.03.009

- Kinnier, R. T., & Metha, A. T. (1989). Regrets and priorities at three stages of life. *Counseling and Values*, 33(3), 182-193. Retrieved from https://www.researchgate.net/profile/Richard_Kinnier/publication/232564914_Regrets_and_priorities_at_three_stages_of_life/links/56046e8f08ae5e8e3f30e7d2.pdf
- Kuyken, W., Byford, S., Taylor, R. S., Watkins, E., Holden, E., White, K., ... & Teasdale, J. D. (2008). Mindfulness-based cognitive therapy to prevent relapse in recurrent depression. *Journal of Consulting and Clinical Psychology*, 76(6), 966. doi:10.1037/a0013786
- Landman, J. (1987). Regret and elation following action and inaction: Affective responses to positive versus negative outcomes. *Personality and Social Psychology Bulletin*, 13(4), 524-536. doi:10.1177/0146167287134009
- Lecci, L., Okun, M. A., & Karoly, P. (1994). Life regrets and current goals as predictors of psychological adjustment. *Journal of Personality and Social Psychology*, 66(4), 731-741. doi:10.1037//0022-3514.66.4.731
- Lee, S. H., & Cotte, J. (2009). Post-purchase consumer regret: Conceptualization and development of the PPCR Scale. *Advances in Consumer Research*, 36(1), 352-356. Retrieved from http://www.acrwebsite.org/volumes/v36/NAACR_v36_290.pdf
- Lyubomirsky, S., & Nolen-Hoeksema, S. (1993). Self-perpetuating properties of dysphoric rumination. *Journal of Personality and Social Psychology*, 65(2), 339-349. Retrieved from <http://drsonja.net/wpcontent/themes/drsonja/papers/LN1993.pdf>
- Lyubomirsky, S., & Nolen-Hoeksema, S. (1995). Effects of self-focused rumination on negative thinking and interpersonal problem solving. *Journal of Personality and Social*

- Psychology*, 69, 176-190. Retrieved from <http://sonjalyubomirsky.com/wp-content/themes/sonjalyubomirsky/papers/LN1995.pdf>
- Marcatto, F., & Ferrante, D. (2008). The regret and disappointment scale: An instrument for assessing regret and disappointment in decision making. *Judgment and Decision Making*, 3(1), 87-99. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.420.2385&rep=rep1&type=pdf>
- McLaughlin, K. A., & Nolen-Hoeksema, S. (2011). Rumination as a transdiagnostic factor in depression and anxiety. *Behaviour Research and Therapy*, 49(3), 186-193. doi:10.1016/j.brat.2010.12.006
- Nelson, T. O., Stuart, R. B., Howard, C., & Crowley, M. (1999). Metacognition and clinical psychology: A preliminary framework for research and practice. *Clinical Psychology & Psychotherapy*, 6(2), 73-79. Retrieved from https://www.researchgate.net/profile/Richard_Stuart2/publication/230074723_Metacognition_and_Clinical_Psychology_A_Preliminary_Framework_for_Research_and_Practice/links/02e7e51b643294c887000000.pdf
- Nolen-Hoeksema, S. (2000). The role of rumination in depressive disorders and mixed anxiety/depressive symptoms. *Journal of Abnormal Psychology*, 109(3), 504-511. doi:101037/10021-843X.109.3.504
- Nolen-Hoeksema, S., & Morrow, J. (1991). A prospective study of depression and posttraumatic stress symptoms after a natural disaster: The 1989 Loma Prieta earthquake. *Journal of Personality and Social Psychology*, 61, 115-121. Retrieved from https://www.researchgate.net/profile/Jannay_Morrow/publication/21264569_A_prospecti

ve_study_of_depression_and_posttraumatic_stress_symptoms_after_a_natural_disaster_The_1989_Loma_Prieta_earthquake/links/02e7e524428c66a0d1000000.pdf

Nolen-Hoeksema, S., Wisco, B. E., & Lyubomirsky, S. (2008). Rethinking rumination. *Perspectives on Psychological Science*, 3(5), 400-424. doi:10.1111/j.1745-6924.2008.00088.x

Noonan, S. (2014). Mindfulness-based stress reduction. *The Canadian Veterinary Journal*, 55(2), 134. Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3894868/pdf/cvj_02_134.pdf

Nyklicek, I., Vingerhoets, A., & Zeelenberg, M. (Eds.). (2011). *Emotion Regulation and Well-Being*. New York, NY: Springer.

Orth, U., Berking, M., & Burkhardt, S. (2006). Self-conscious emotions and depression: Rumination explains why shame but not guilt is maladaptive. *Personality and Social Psychology Bulletin*, 32(12), 1608-1619. doi:10.1177/0146167206292958

Papageorgiou, C. & Wells, A. (2004). Nature, functions, and beliefs about depressive rumination. In C. Papageorgiou & A. Wells (Eds.), *Depressive rumination: Nature, theory, and treatment* (pp. 3-20). New York: Wiley.

Pedersen, W. C., Denson, T. F., Goss, R. J., Vasquez, E. A., Kelley, N. J., & Miller, N. (2010). The impact of rumination on aggressive thoughts, feelings, arousal, and behaviour. *British Journal of Social Psychology*, 50, 281-301. doi:10.1348/014466610X515696

Pethtel, O., & Chen, Y. (2014). Life regrets and life satisfaction in mature adults. *The Journal of Happiness and Well-Being*, 2(2), 106-118. Retrieved from <http://www.journalofhappiness.net/frontend/articles/pdf/v02i02/2.pdf>

- Pickert, K. (2014). The mindful revolution. *TIME Magazine*, 3. Retrieved from <https://drive.google.com/viewerng/viewer?a=v&pid=sites&srcid=ZGVmYXVsdGRvbWFpbmxtaW5kZnVsbmVzc21lZGl0YXRpb25ueWN8Z3g6NDYzMWE4MTIzZDQwMzlmMw>
- Piet, J., & Hougaard, E. (2011). The effect of mindfulness-based cognitive therapy for prevention of relapse in recurrent major depressive disorder: a systematic review and meta-analysis. *Clinical Psychology Review*, 31(6), 1032-1040.
doi:10.1016/j.cpr.2011.05.002
- Pirson M., Langer E. J., Bodner T., Zilcha-Mano S. (2012). *The Development and Validation of the Langer Mindfulness Scale - Enabling a Socio-Cognitive Perspective of Mindfulness in Organizational Contexts*. Fordham University Schools of Business Research Paper.
Retrieved from <http://ssrn.com/abstract=2158921>
- Princeton University Library. (2007). *Introduction to regression*. Retrieved from http://dss.princeton.edu/online_help/analysis/regression_intro.htm
- Querstret, D., & Cropley, M. (2013). Assessing treatments used to reduce rumination and/or worry: A systematic review. *Clinical Psychology Review*, 33(8), 996-1009.
doi:10.1016/j.cpr.2013.08.004
- Rippere, V. (1977). 'What's the thing to do when you're feeling depressed?' — a pilot study. *Behaviour Research and Therapy*, 15(2), 185-191. doi:10.1016/0005-7967(77)90104-8
- Robinson, M. S., & Alloy, L. B. (2003). Negative cognitive styles and stress-reactive rumination interact to predict depression: A prospective study. *Cognitive Therapy and Research*,

- 27(3), 275-292. Retrieved from
<http://sites.temple.edu/moodandcognitionlab/files/2014/01/Robinson-Alloy-2003.pdf>
- Roese, N. J., Epstude, K., Fessel, F., Morrison, M., Smallman, R., Summerville, A. . .
 Segerstrom, S. (2009). Repetitive regret, depression, and anxiety: Findings from a nationally representative survey. *Journal of Social and Clinical Psychology, 28*(6), 671-688. doi:10.1521/jscp.2009.28.6.671
- Roseman, I. J., Wiest, C., & Swartz, T. S. (1994). Phenomenology, behaviors, and goals differentiate discrete emotions. *Journal of Personality and Social Psychology, 67*(2), 206-221. doi:10.1037/0022-3514.67.2.206
- Scelfo, J. (2015, July 27). Suicide on campus and the pressure of perfection. *The New York Times*. Retrieved from http://www.nytimes.com/2015/08/02/education/edlife/stress-social-media-and-suicide-on-campus.html?_r=1
- Schoeffler, M. S. (1962). Prediction of some stochastic events: A regret equalization model. *Journal of Experimental Psychology, 64*(6), 615-622. doi:10.1037/h0041300
- Schwartz, B., Ward, A., Monterosso, J., Lyubomirsky, S., White, K., & Lehman, D. R. (2002). Maximizing versus satisficing: Happiness is a matter of choice. *Journal of Personality and Social Psychology, 83*(5), 1178-1197. doi:10.1037/0022-3514.83.5.1178
- Scott, L. D., Arslanian-Engoren, C., & Engoren, M. C. (2014). Association of sleep and fatigue with decision regret among critical care nurses. *American Journal of Critical Care: An Official Publication, American Association of Critical-Care Nurses, 23*(1), 13-23. doi:10.4037/ajcc2014191

- Scott, V. B., & McIntosh, W. D. (1999). The development of a trait measure of ruminative thought. *Personality and Individual Differences, 26*(6), 1045-1056. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.524.2080&rep=rep1&type=pdf>
- Segal, Z. V., Williams, J. M. G., & Teasdale, J. D. (2002). *Mindfulness-based cognitive therapy for depression: A new approach to relapse prevention*. New York, NY: Guilford.
- Shapiro, S. L., Carlson, L. E., Astin, J. A., & Freedman, B. (2006). Mechanisms of mindfulness. *Journal of Clinical Psychology, 62*(3), 373-386. doi: 10.1002/jclp.20237
- Sheeran, P., & Orbell, S. (1999). Augmenting the theory of planned behavior: Roles for anticipated regret and descriptive norms¹. *Journal of Applied Social Psychology, 29*(10), 2107-2142. doi:10.1111/j.1559-1816.1999.tb02298.x
- Shonin, E., Van Gordon, W., & Singh, N. N. (Eds.). (2015). *Buddhist Foundations of Mindfulness*. Springer.
- Siripanit, K., Manasveepongskul, T., & Ratanachatchuchai, S. (2013). *Relationship between rumination and anxiety: The moderating effect of mindfulness*. Senior project Chulalongkorn University. Retrieved from http://cuir.car.chula.ac.th/bitstream/123456789/44156/1/Kulpariya_si.pdf
- Smith, J. M., & Alloy, L. B. (2009). A roadmap to rumination: A review of the definition, assessment, and conceptualization of this multifaceted construct. *Clinical Psychology Review, 29*(2), 116-128. doi:10.1016/j.cpr.2008.10.003
- Teasdale, J. D., Segal, Z., & Williams, J. M. G. (1995). How does cognitive therapy prevent depressive relapse and why should attentional control (mindfulness) training help?. *Behaviour Research and Therapy, 33*(1), 25-39. doi:10.1016/0005-7967(94)E0011-7

- Thera, N. (1962). *Satipatthana: The heart of Buddhist meditation: A handbook of mental training based on the Buddha's way of mindfulness*. Kandy, Sri Lanka: Rider.
- Torges, C. M., Stewart, A. J., & Nolen-Hoeksema, S. (2008). Regret resolution, aging, and adapting to loss. *Psychology and Aging, 23*(1), 169-180. doi:10.1037/0882-7974.23.1.169
- Treynor, W., Gonzalez, R., & Nolen-Hoeksema, S. (2003). Rumination reconsidered: A psychometric analysis. *Cognitive Therapy and Research, 27*(3), 247-259. Retrieved from https://deepblue.lib.umich.edu/bitstream/handle/2027.42/44342/10608_2004_Article_464752.pdf?sequence=1
- Tsiros, M. (1998). Effect of regret on post-choice valuation: The case of more than two alternatives. *Organizational Behavior and Human Decision Processes, 76*(1), 48-69. doi:10.1006/obhd.1998.2793
- Van Dijk, W. W., & Zeelenberg, M. (2002). Investigating the appraisal patterns of regret and disappointment. *Motivation and Emotion, 26*(4), 321-331. doi:10.1023/A:1022823221146
- Wallace, B. A. (1999). The buddhist tradition of samatha: Methods for refining and examining consciousness. *Journal of Consciousness Studies, 6*(2-3), 175-187. Retrieved from <http://www.cebtm.net/CEB%20Background/Wallace-Samatha.pdf>
- Walach, H., Buchheld, N., Buttenmüller, V., Kleinknecht, N., & Schmidt, S. (2006). Measuring mindfulness—the Freiburg mindfulness inventory (FMI). *Personality and Individual Differences, 40*(8), 1543-1555. doi:10.1016/j.paid.2005.11.025
- Williams, J. M. G. (2008). Mindfulness, depression and modes of mind. *Cognitive Therapy and Research, 32*(6), 721-733. doi:10.1007/s10608-008-9204-z

- Williams, J. M. G., & Kuyken, W. (2012). Mindfulness-based cognitive therapy: a promising new approach to preventing depressive relapse. *FOCUS*, *200*, 359–360.
doi:<http://dx.doi.org/10.1176/appi.focus.10.4.489>
- Wilkinson, P., & Goodyer, I. (2008). The effects of cognitive-behavioural therapy on mood-related ruminative response style in depressed adolescents. *Child and Adolescent Psychiatry and Mental Health*, *2*(3). doi:10.1186/1753-2000-2-3
- Witkiewitz, K., Marlatt, G. A., & Walker, D. (2005). Mindfulness-based relapse prevention for alcohol and substance use disorders. *Journal of Cognitive Psychotherapy*, *19*(3), 211-228.
doi: <http://dx.doi.org/10.1891/jcop.2005.19.3.211>
- Wrosch, C., Bauer, I., Miller, G. E., & Lupien, S. (2007). Regret intensity, diurnal cortisol secretion, and physical health in older individuals: Evidence for directional effects and protective factors. *Psychology and Aging*, *22*(2), 319-330. doi:10.1037/0882-7974.22.2.319
- Wrosch, C., Bauer, I., & Scheier, M. F. (2005). Regret and quality of life across the adult life span: The influence of disengagement and available future goals. *Psychology and Aging*, *20*(4), 657-670. doi:10.1037/0882-7974.20.4.657
- Zeelenberg, M. (1999). The use of crying over spilled milk: A note on the rationality and functionality of regret. *Philosophical Psychology*, *12*(3), 325-340.
doi:10.1080/095150899105800
- Zeelenberg, M., & Breugelmans, S. M. (2008). The role of interpersonal harm in distinguishing regret from guilt. *Emotion*, *8*(5), 589-596. doi:10.1037/a0012894

Zeelenberg, M., van Dijk, W. W., S.R.Manstead, A., & der Pligt, J. (1998a). The experience of regret and disappointment. *Cognition & Emotion*, *12*(2), 221-230.

doi:10.1080/026999398379727

Zeelenberg, M., van Dijk, W. W., van der Pligt, J., S.R.Manstead, A., van Empelen, P., & Reinderman, D. (1998b). Emotional reactions to the outcomes of decisions: The role of counterfactual thought in the experience of regret and disappointment. *Organizational Behavior and Human Decision Processes*, *75*(2), 117-141. doi:10.1006/obhd.1998.2784

Appendix A

Rumination Scale

คำชี้แจง: ให้ท่านระลึกถึงประสบการณ์ที่ทำให้รู้สึกไม่ดี เสียใจ หรือ ซึมเศร้า จากนั้นโปรดพิจารณา

แต่ละข้อความว่า ท่านมัก **‘คิด’** หรือ **‘กระทำ’** อย่างไร เมื่อเผชิญกับเหตุการณ์ดังกล่าว โดยทำ

เครื่องหมาย ล้อมรอบตัวเลขหรือทำเครื่องหมาย X ในช่องที่เห็นว่าตรงกับท่านมากที่สุด

1 = แทบจะไม่เคยเลย 2 = บางครั้ง 3 = บ่อยครั้ง 4 = เกือบตลอดเวลา

ข้อ	ข้อความ	แทบจะไม่เคย เลย	บางครั้ง	บ่อยครั้ง	เกือบตลอด เวลา
1	ฉันมักครุ่นคิดความรู้สึกโดดเดี่ยวที่มี	1	2	3	4
2	ฉันมักคิดว่า ฉันจะ ไม่สามารถทำอะไรต่อได้ หากยังคง รู้สึกแย่อยู่”	1	2	3	4
3	ฉันมักคิดถึง ”ความรู้สึกปวดเมื่อยและเหนื่อยล้า”	1	2	3	4
4	ฉันคิดว่า ฉัน เรื่องยากที่จะมีสมาธิกับเรื่องใดเรื่อง หนึ่ง”	1	2	3	4
5	ฉันคิดซ้ำไปมาว่า ทำไม จึงเกิดเรื่องเช่นนี้กับฉัน”	1	2	3	4
6	ฉันมักคิดว่า ”ตนเองไม่มีอำนาจและท้อแท้เสีย เหลือเกิน”	1	2	3	4
7	ฉันมักวิเคราะห์เหตุการณ์ต่างๆ เพื่อพยายามทำความเข้าใจ ว่าทำไมฉันจึงรู้สึกซึมเศร้าเช่นนี้	1	2	3	4
8	ฉันคิดว่า ฉัน ไม่รู้สึกระไรอีกแล้วต่อไป/หมดสิ้น ความรู้สึกกับสิ่งต่างๆแล้ว”	1	2	3	4
9	ฉันคิดว่า ทำไม ฉันถึงหมดแรง ทำอะไรไม่ไหว”	1	2	3	4
10	ฉันคิดว่า ทำไม ฉันถึงได้มีปฏิกิริยาตอบสนองต่อสิ่ง ต่างๆอย่างที่ เป็นเช่นนี้”	1	2	3	4
11	ฉันหลบมาอยู่คนเดียวแล้วครุ่นคิดว่า ทำไมตนเองจึงรู้สึก เช่นนี้	1	2	3	4
12	บางครั้งเรื่องที่คิด คาใจฉันเสียจน ฉันต้องเขียนออกมา วิเคราะห์ต่อ	1	2	3	4

13	ฉันคิดถึงเหตุการณ์ที่เพิ่งเกิดขึ้น และคิดว่าอยากให้เหตุการณ์นั้นจบลงดีกว่านี้	1	2	3	4
14	ฉันมักคิดว่า “หากฉันยังรู้สึกเช่นนี้ ฉันจะทำให้ไม่มีสมาธิ/ทำใจจดจ่ออยู่กับงานได้”	1	2	3	4
15	ฉันมักคิดว่า “ทำไมฉันถึงต้องประสบปัญหาแบบที่คนอื่นเขาไม่เจอ”	1	2	3	4
16	ฉันคิดว่า “ทำไมฉันถึงไม่สามารถรับมือกับเรื่องที่เจอ/สิ่งที่เกิดขึ้นได้ดีกว่านี้”	1	2	3	4
17	ฉันมักครุ่นคิดถึงความเสียใจที่มี	1	2	3	4
18	ฉันมักครุ่นคิดถึงข้อบกพร่อง ความล้มเหลว ความผิดพลาดทั้งหมดของตนเอง	1	2	3	4
19	ฉันคิดว่า “ฉันไม่มีก้อยากทำอะไรเลย”	1	2	3	4
20	ฉันวิเคราะห์บุคลิกภาพตัวเอง เพื่อพยายามทำความเข้าใจว่าทำไมฉันจึงรู้สึกซึมเศร้า	1	2	3	4
21	ฉันไปสถานที่ต่างๆ เพื่อนึกทบทวนถึงความรู้สึกต่างๆ ที่เกิดขึ้น	1	2	3	4
22	ฉันมักคิดถึงความโกรธที่มีต่อตัวเอง	1	2	3	4

Appendix B

Mindfulness Scale

คำชี้แจง: โปรดพิจารณาข้อกระทงต่อไปนี้ จากประสบการณ์ในสามวันที่ผ่านมาของท่าน โดยทำ

เครื่องหมาย ○ ล้อมรอบตัวเลขหรือทำเครื่องหมาย X ในช่องที่เห็นว่าตรงกับท่านมากที่สุด

1 = แทบจะไม่เคยเลย 2 = บางครั้ง 3 = บ่อยครั้ง 4 = เกือบตลอดเวลา

ข้อ	ข้อความ	แทบจะไม่เคย เลย	บางครั้ง	บ่อยครั้ง	เกือบตลอด เวลา
1	ฉันเปิดรับประสบการณ์ที่มีในปัจจุบัน	1	2	3	4
2	ฉันรับรู้ถึงร่างกายของตัวเอง ไม่ว่าจะขณะรับประทานอาหาร ทำความสะอาด หรือพูดคุย	1	2	3	4
3	เมื่อฉันรู้ว่าตนเองใจลอย ฉันจะค่อยๆดึงตนเองกลับมาสู่ปัจจุบัน	1	2	3	4
4	ฉันทำให้ตนเองพึงพอใจอย่างที่ตนเป็นได้	1	2	3	4
5	ฉันสนใจเหตุผลที่อยู่เบื้องหลังการกระทำของฉัน	1	2	3	4
6	ฉันรับรู้ความผิดพลาด และความยุ่งยากที่ตนเองมีโดยไม่ตีโพยตีพาย	1	2	3	4
7	ฉันอยู่กับประสบการณ์ที่มีในปัจจุบัน	1	2	3	4
8	ฉันยอมรับประสบการณ์ที่ไม่น่าพึงพอใจ	1	2	3	4
9	ฉันเป็นมิตรต่อตนเอง แม้ว่าฉันจะทำอะไรผิดพลาด	1	2	3	4
10	ฉันเฝ้าสังเกตความรู้สึกต่างๆ ของตนเอง โดยไม่จมไปกับความรู้สึกเหล่านั้น	1	2	3	4
11	เวลาเจอสถานการณ์ยุ่งยาก ฉันสามารถหยุดตนเอง <u>ไม่</u> ตอบสนองไปทันที/ <u>ไม่</u> ทำอะไรนุ่มน่อม	1	2	3	4
12	ฉันยังรู้สึกสงบและผ่อนคลาย แม้ว่าจะเจอช่วงเวลาที่ยุ่งวายและตึงเครียด	1	2	3	4
13	ฉันอารมณ์เสียง่ายทั้งกับตนเอง และผู้อื่น	1	2	3	4
14	ฉันยังสามารถยิ้มได้ แม้ว่าฉันจะรู้ว่าบางครั้งฉันก็ทำให้ชีวิตของตนเองยุ่งยาก	1	2	3	4

Appendix C

Regret Scale

คำชี้แจง: จงอ่านและจินตนาการเหตุการณ์สมมุติด้านล่าง และจินตนาการว่าหากเหตุการณ์นั้นเกิดกับท่าน แล้วขอให้ท่าน

ตอบคำถามต่อไปนี้ โดยระบุว่า ท่านเห็นด้วยกับข้อความต่อไปนี้มากน้อยแค่ไหน โดยทำเครื่องหมาย ○ ส้อมรอบตัวเลข

หรือทำเครื่องหมาย X ในช่องที่เห็นว่าตรงกับท่านมากที่สุด

เหตุการณ์จำลอง

—สมมุติว่า ปกติแล้วคุณเตรียมตัวสอบพร้อมกับเพื่อนของคุณ แต่ครั้งนี้คุณไม่อยากและไม่ได้ไปเตรียมตัวสอบกับเพื่อน เพื่อนๆ

ของคุณสอบผ่าน แต่คุณไม่ผ่าน”

0 = ไม่เห็นด้วยเลย 1 = ไม่เห็นด้วยอย่างยิ่ง 2 = ไม่เห็นด้วย 3 = เห็นด้วยและไม่เห็นด้วยพอกัน

4 = เห็นด้วย 5 = เห็นด้วยอย่างยิ่ง

ข้อ	ข้อความ	ไม่เห็นด้วย เลย	ไม่เห็นด้วย อย่างยิ่ง	ไม่เห็น ด้วย	เห็นด้วยและไม่เห็น ด้วยพอกัน	เห็น ด้วย	เห็นด้วย อย่างยิ่ง
1	ฉันรู้สึกเสียค่า	0	1	2	3	4	5
2	ฉันคิดว่าฉันได้ทำผิดพลาด ไปแล้ว	0	1	2	3	4	5
3	ฉันอยากแก้ไขความผิดพลาด ของฉัน	0	1	2	3	4	5
4	ฉันรู้สึกโกรธตัวเอง	0	1	2	3	4	5
5	ฉันคิดว่าฉันเป็นผู้รับผิดชอบ ต่อสถานการณ์ที่เกิดขึ้น	0	1	2	3	4	5

Appendix D

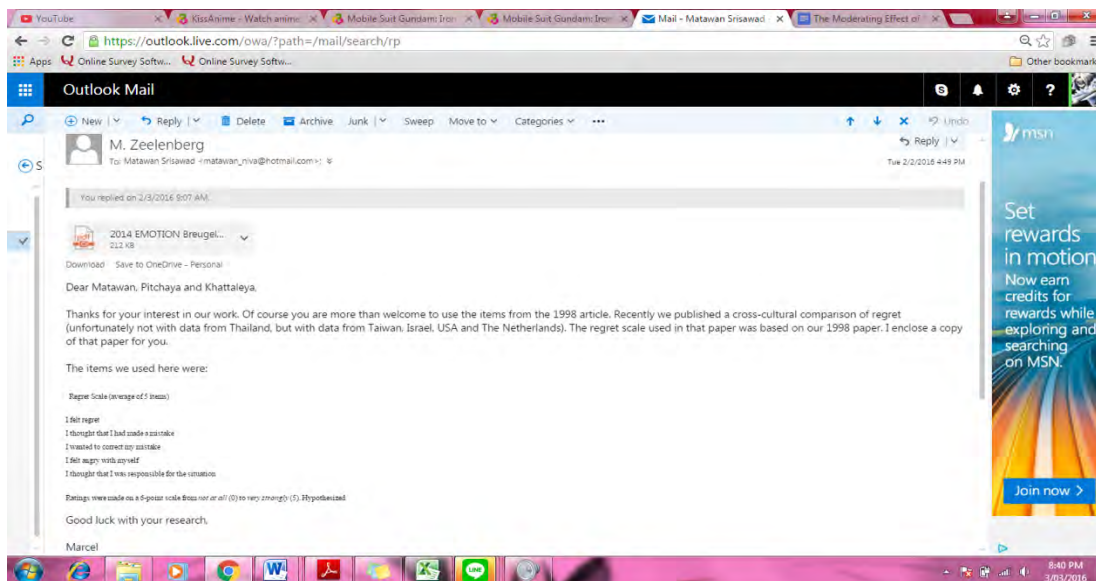
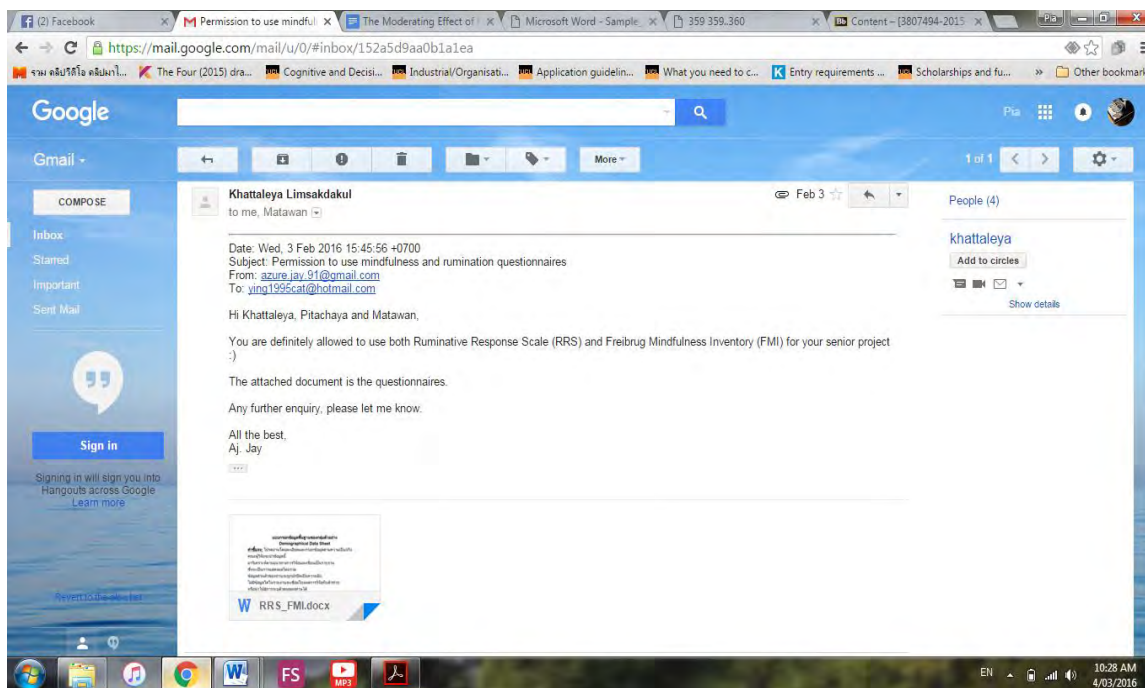
Approval of the Back-Translated Version of the Regret Scale Items

Original version	Back-translated version	Yes/No
I felt regret.	I feel regret.	yes
I thought that I had made a mistake.	I think I've made a mistake.	yes
I wanted to correct my mistake.	I want to fix my mistakes.	yes
I felt angry with myself	I am angry with myself.	yes
I thought that I was responsible for the situation.	I think I am responsible for what happened.	yes

Approval and Comment of the Back-Translated version of the Regret Scenario

Original Version	Back-translated version	Yes/No	Comment
Imagine that you usually prepare for your exams together with friends. This time you do not want to do that. Your friends pass the exam, but you do not.	Normally you have been preparing for exams with your friends, but you don't join them this time. Your friends pass the exam but you don't.	no	They imply much the same idea, but to be safe, the Thai version should be more thorough. The original states imply failure to study with group because of not wanting to. Back-translated just states failure to study with group, and it's not clear whether this failure is due to not wanting to, or for general reasons (unknown reasons). Better to add to Thai version "didn't want to (...and didn't do it)"

Appendix E

Permission to use Breugelmans et al's (2014) Regret scale*Permission to use Siripanit, Manasveepongakul, and Ratanachatchuchai's (2013) translated scales in Mindfulness and Rumination*

Appendix F

Regret Scale Corrected Item-Total Correlation Value

Items	CITC Value
1. ฉันรู้สึกเสียใจ	0.67
2. ฉันคิดว่าฉันได้ทำผิด พลาดลงไปแล้ว	0.74
3. ฉันอยากแก้ไขความ ผิดพลาดของฉัน	0.67
4. ฉันรู้สึกโกรธตัวเอง	0.70
5. ฉันคิดว่าฉันเป็นผู้รับผิดชอบต่อสถานการณ์ที่เกิดขึ้น	0.26

Bibliography

Pitchaya Chulpaiboon

Pitchaya Chulpaiboon is currently in a Psychology major at Chulalongkorn University. As part of their Joint International Psychology Program, she also recently graduated from the University of Queensland, with a BA in an extended major in Psychology and a minor in Sociology in December, 2015. Pitchaya is interested in cross-cultural management and perspectives. She hopes to further her experiences by working to explore how people really behave in organizations, as well as how organizations function as a whole. She aims to make use of her psychological knowledge and skills to help bridge across cultural differences in a variety of contexts, especially between organizations.

Matawan Srisawad

Matawan Srisawad is an undergraduate student currently enrolled in the Joint International Psychology Program (JIPP) at Chulalongkorn University who has just recently graduated from The University of Queensland with a BA in psychology. She has high interest in learning about individual differences and enjoys listening to other people's stories. With the experience of living abroad in Australia; getting to meet new people in a novel environment, Matawan has become even more attracted to psychology. Her plan for the future is to further her study in industrial and organisational psychology and to find a career as a consultant, a role which will allow her to use her psychological knowledge to help harmonize and minimize business/organizational problems. It is also her intention to constantly engage in research which would hopefully be able to contribute to the society's understanding about people/human beings.

Khattaleya Limsakdakul

Khattaleya Limsakdakul is currently completing her undergraduate program in Psychology at the Chulalongkorn University, Bangkok. As part of her program, she recently graduated from the University of Queensland with a Bachelor of Arts in Psychology, 2015. Khattaleya has always been passionate about understanding the world from different angles and is committed to bring out a positive change to the world in her own way. In the near future, Khattaleya hopes to operate her own social business and aims to take use of her knowledge in Psychology to the most benefit.