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THE RELATIONS BETWEEN RUMINATION, THOUGHT CONTROL, AND SUICIDAL THINKING

by

Morgan Buerke

A Thesis
Submitted to the Graduate School,
the College of Education and Human Sciences
and the School of Psychology
at The University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Master of Arts

Approved by:

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May 2023

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2023

Published by the Graduate School

ABSTRACT

Despite the far-reaching impact of suicide on our communities, we need more research to understand how suicidal thoughts develop, and what leads to their maintenance. As suggested by the depression distress-amplification model (Capron et al., 2013), emotion-regulation strategies such as rumination may cause or worsen suicidal ideation by amplifying the distress associated with negative thoughts. In addition, ruminative thoughts are often described as difficult to control, which may lead people to think about suicide as an escape from these uncontrollable thoughts. The current study examined the relationship between certain forms of rumination (i.e., brooding, reflection, anger rumination, and suicidal rumination) and likelihood and severity of lifetime suicidal thinking in a sample of 228 undergraduate students at the University of Southern Mississippi. For each form of rumination that was related to suicidal thinking, I then examined whether that relationship was explained by perceived loss of control of one's own thoughts. I found that all forms of rumination were related to likelihood and severity of lifetime suicidal thinking, as well as heightened perceived inability to control one's own thoughts. This thought control inability at least partially explained the relationship between brooding, reflection, and anger rumination's relationships with both likelihood and severity of suicidal thinking. Thought control did not play a role in the relationship between suicidal rumination and suicidal ideation severity or likelihood. Clinicians should be aware of the impact ruminative thoughts may have on suicidal thinking. More research needs to be done to replicate and extend these effects.

ACKNOWLEDGMENTS

I would like to thank my mentor, Dr. Dan Capron for providing expert assistance on every aspect of this thesis, from conceptualization to writing, as well as his continuous positive comments and helpful feedback. I would also like to thank my other thesis members, Dr. Stephanie Smith and Dr. Megan Renna, for their thought-provoking comments and helpful guidance on the final version of this manuscript. Lastly, I would also like to acknowledge my husband, Amir Mafi, for his unwavering support in all my academic endeavors.

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CHAPTER I - INTRODUCTION

Annual suicide deaths number over 50,000 people in the United States alone (Drapeau & McIntosh, 2021). This comes out to approximately one person every 11.5 minutes who dies by suicide (Drapeau & McIntosh, 2021). Non-lethal suicide attempts are even more common, occurring anywhere from 10-30 times more often than death by suicide (Bachmann, 2018; Drapeau & McIntosh, 2021) and 9.8 million adults experience serious suicidal thinking in a given year (Piscopo et al., 2016). Due to the prevalence of suicidal thoughts and behaviors, more study is needed to elucidate the causes of suicidal thinking and the mechanisms whereby it can translate into suicidal behavior.

Currently assessed risk factors for suicide barely predict suicidal behavior over chance (Franklin et al., 2017). For instance, previous suicidal behavior is considered the most predictive marker for future suicide risk (Beghi et al., 2013). Beautrais (2004) found that out of a sample with serious suicidal behavior, those with a prior suicide attempt had a 37% chance of making another attempt or a 6.7% chance of dying by suicide in the next 5 years. However, the predictive utility of past suicidal behavior is low as many individuals, specifically older adults, die by suicide after only their first attempt (Paraschakis et al., 2012). One of the reasons that risk for suicidal behavior has been so difficult to study is because it usually requires large longitudinal studies, with data collection spanning years (Ribeiro et al., 2019). Instead, it may be beneficial to study factors that may explain or worsen suicidal thinking, ultimately leading to suicidal behavior.

Suicidal thinking has been termed “suicidal ideation,” which involves thoughts about ending one’s own life. This can range from passive death wish, or thoughts such as “I wish I wasn’t here anymore” or “I wish I was dead” to more active thoughts of harming oneself with the intent to die (Posner et al., 2011). While the assessment of suicidal ideation often varies based on which measure is used, suicidal ideation is most often considered as the severity of one’s suicidal thinking (i.e., level of intent to die, planning, etc.), with less attention given to other important facets of suicidal ideation such as the frequency, duration, and controllability of suicidal thoughts (Beck et al., 1979; Posner et al., 2011). Although there are obvious benefits to studying the severity of suicidal thoughts, as more severe thoughts such as suicidal ideation with a plan are predictive of future suicidal behaviors (Nock et al., 2008), other thought processes, such as the frequency and controllability of these thoughts, also deserve study.

Frequency of negative thoughts, such as those found in suicide, may be of particular interest because continuously dwelling on particular thoughts can increase the distress associated with the thought (Michl et al., 2013) and factors that increase other negative thoughts may also exacerbate negative feelings, which may lead to an increase in suicidal thinking (Capron et al., 2013). Along this line of reasoning, recent attempters are more likely to have frequent thoughts of suicide (Kleiman et al., 2018), indicating that frequency of suicidal thoughts may be particularly relevant to suicidal behaviors.

In addition, control of suicidal thoughts is often assessed to determine risk for suicide. For instance, studies surveying why people make attempts have found a consistent pattern whereby many people who attempted suicide felt that their feelings of

losing control of their life situation, thoughts, and/or feelings played a role in their attempt (Bonnewyn et al., 2014; Crocker et al., 2006; Pavulans et al., 2012). In addition, attempting to control suicidal thoughts through suppression oftentimes backfires, resulting in increases in suicidal ideation over time (Pettit et al., 2009). These findings indicate that certain thought processes, such as those that impact the frequency and controllability of suicidal thinking may be particularly important for the study of suicide.

These thought processes are specifically important to understand given the transdiagnostic nature of suicide. One of the reasons that the study of suicide remains so complex is because it can be precipitated by multiple psychiatric disorders, such as mood, anxiety, substance use, bipolar, psychotic, eating, and personality disorders (Harris & Barraclough, 1997; Nock et al., 2008, 2010). It's transdiagnostic nature therefore makes it difficult to study, yet much of the research done on suicide risk examines risk factors in the context of a particular diagnosis (e.g., depression). This is problematic, as it has been hypothesized that suicide's relationship with many of these psychiatric disorders is due to the presence of any psychopathology, rather than to a specific diagnosis (Hoertel et al., 2015). In addition, there is still a percentage of the population that die by suicide who may have had no psychiatric disorder whatsoever (Nock et al., 2010). This provides evidence that suicide is not a diagnostically specific problem, and that greater emphasis should be placed on investigation of transdiagnostic risk factors for suicide that can impact the frequency and controllability of suicidal thinking, rather than diagnostically specific ones (i.e., anhedonia in the context of depression, undereating in the context of anorexia, etc.).

1.1 Rumination

Rumination is one such transdiagnostic thought process that increases the frequency of other negative thoughts, such as suicidal, depressive, and angry thoughts (Nolen-Hoeksema & Morrow, 1991; Rogers, Law, et al., 2021; Sukhodolsky et al., 2001). Broadly, rumination is defined as a repetitive preoccupation with one's thoughts or feelings (Nolen-Hoeksema et al., 2008). Unlike other forms of repetitive thinking that focus on the future such as worry, rumination tends to focus on events/feelings related to the past (Ehring & Watkins, 2008) and in most instances, is focused on negative thoughts (i.e., "Why can't I get going", "I don't feel anything anymore"; Fresco et al., 2002; Nolen-Hoeksema & Morrow, 1991). Rumination has been related to a number of psychiatric disorders, including depression, anxiety, post-traumatic stress disorder, obsessive-compulsive disorder, etc. (Michl et al., 2013; Moulds et al., 2020; Nolen-Hoeksema et al., 2008; Raines et al., 2017; Wahl et al., 2021).

To date, the most commonly studied form of rumination is depressive rumination, which involves a frequent preoccupation with depressive thoughts and feelings, and the causes and consequences of each (Nolen-Hoeksema & Morrow, 1991; Smith & Alloy, 2009). As previous literature has indicated that our current measures of depressive rumination overlap considerably with measures of general symptoms of depression, depressive rumination has been further separated into two subtypes: brooding and reflection (Treynor et al., 2003). Brooding specifically refers to negative self-focus and/or focusing on negatives in a person's life, while reflection refers to focusing on problem-solving to fix depressive symptoms (Treynor et al., 2003). Specifically, brooding often

refers to thoughts that are passive, so it involves thinking about a person's mood and situation without identifying solutions to one's problems (Treynor et al., 2003). In contrast, reflection may involve a neutral problem-solving approach to one's problems, and it may be similar to coping with one's problems.

A review of depressive rumination and suicide from 2017 indicated that depressive rumination in general (both brooding and reflective rumination combined) and brooding were related to same-time ideation and likelihood of having a past attempt, as well as predicting follow-up ideation (Rogers & Joiner, 2017). However, reflection was not related to same-time ideation or history of attempt, only prospective ideation, and no studies were done at the time of the review that examined rumination in the prediction of prospective attempts (Rogers & Joiner, 2017). Authors speculated that this may have to do with the problem-solving nature of reflection, where short-term focus on problem solving one's difficulties may be helpful, but focusing on these negative thoughts, even in a problem-solving manner can be harmful long-term (Rogers & Joiner, 2017). While there were few studies examining these relationships used in the review, since then, multiple cross-sectional studies have been done that support a positive relationship between overall depressive rumination (brooding and reflection combined) and suicidal behavior (Akpinar Aslan et al., 2020; Buerke et al., 2021; Tang et al., 2021), and a positive relationship between brooding and suicidal ideation (Rogers et al., 2017; White et al., 2017) and behavior (Rogers et al., 2017). However, there is still discrepant information about whether reflection is related to suicidal ideation as the two studies conducted since the initial review did find a relationship between reflection and suicidal

ideation in two differing samples (Tang et al., 2021; White et al., 2017). In addition, one study in patients currently in a major depressive episode did find that brooding was not related to past suicidal behavior (Tang et al., 2021).

Like depression, there is evidence for the relationship between anger and suicidal behavior (Daniel et al., 2009; Osman et al., 2010), with many who make an attempt listing experiences of anger directly before their attempt (Chapman & Dixon-Gordon, 2007). However, this relationship has been less well studied. Anger rumination, which involves focusing repetitive thinking on one's thoughts and feelings of anger, usually following an anger-provoking event (Sukhodolsky et al., 2001), has been found to prolong angry feelings. For instance, there is evidence that anger usually dissipates approximately ten minutes after an anger-provoking event (Averill, 1982; Tyson, 1998), however, anger rumination can increase feelings of anger and prolong them to up to eight hours after the event (Bushman et al., 2005). Therefore, anger rumination's increased duration of anger may lead to the development or worsening of suicidal thoughts.

Despite anger rumination's theoretical relevance to the study of suicide, only four studies to-date have examined the relationship between anger rumination and suicidal ideation. Most studies have found a relationship between anger rumination and ideation in those with Major Depressive Disorder (Uğur & Polat, 2021; Wahba & Hamza, 2022), with one finding a relationship in a sample of undergraduates with and without a diagnosis of borderline personality disorder (Selby et al., 2009) and one finding no relationship in a sample of undergraduates with borderline personality disorder (Cho et

al., 2020). Due to the variation in these samples, it is still unclear whether anger rumination has a relationship with suicidal ideation in the general population.

Anger and depressive rumination specifically occur in response to negative affect (Smith & Alloy, 2009), and therefore describe the frequency of thoughts that may not necessarily encompass suicidal thinking. However, of particular relevance to the study of suicidality is a ruminative subtype that has only recently been evaluated in the literature: suicide-specific rumination (Rogers et al., 2021a).

Suicide-specific rumination directly refers to the frequency of thoughts about suicide. Because suicide rumination is novel, it is still understudied, but has been found to relate to history of suicidal behavior as well as suicidal intent, above and beyond other factors such as suicidal ideation, emotion dysregulation, avoidance, distress tolerance, and even depression and anxiety symptomology (Höller et al., 2022; Rogers, Gallyer, et al., 2021; Rogers & Joiner, 2018). These subtypes of rumination need further study to determine whether they are, in fact, related to suicidal ideation, and through what pathways.

1.2 Controllability of Thoughts

Another important facet when assessing for suicidal thoughts is the controllability of those thoughts, which is included in many frequently-used measures of suicidal ideation (Beck et al., 1979; Posner et al., 2011). For instance, in studies asking those who survived a suicide attempt about factors contributing to their attempt, ability to control thoughts of suicide is often named as a key precipitator of a suicidal behavior (Keyvanara et al., 2010). In addition, distraction from thoughts of suicide has been associated with

lower levels of suicide risk (Tucker et al., 2017). This indicates that use of alternative approaches to these thoughts can be fruitful when handling suicidal thinking.

In addition, it may be possible that lack of control of any thoughts, not just suicidal, may increase levels of ideation as people think of suicide as an escape from those negative thoughts. Feeling like one's life and actions are out of control is often a precipitator of suicidal behavior (Bonnewyn et al., 2014; Crocker et al., 2006; Pavulans et al., 2012). This is consistent with Baumeister (1990)'s theory of suicide in which suicidal actions are often enacted to escape painful thoughts and feelings. This is also consistent with the Depression Distress-Amplification Model (Capron et al., 2013), as feeling unable to control one's own thoughts may be another mechanism that increases the distress associated with a particular negative mood state, which may, in turn, increase the likelihood or severity of suicidal thinking.

One interesting notion is whether having frequent negative thoughts, such as those found in rumination, can increase this lack of thought control, and whether this, in turn, can increase suicidal ideation. For instance, those who are able to distract themselves from repetitive negative thoughts have been found to decrease their depression symptoms (Huffziger & Kuehner, 2009; Nolen-Hoeksema, 1987; Nolen-hoeksema & Morrow, 1993; Rood et al., 2009). In contrast, trying to control these thoughts through suppression actually increases these thoughts (Pettit et al., 2009), which may lead to increased levels of depression, distress, or even suicidal ideation.

1.3 Current Study

This study seeks to examine the relations between 1) multiple subtypes of ruminative thought processes (i.e., depressive rumination brooding and reflection subtypes, anger rumination, and suicidal rumination) and 2) suicidal ideation. I will also examine whether each of the hypothesized relationships are indirect through perceived inability to control one's own thoughts.

I hypothesize that: 1) The presence of brooding and anger rumination1 will be associated with higher likelihood of lifetime suicidal ideation; 2) Brooding, anger, and suicidal rumination will relate to higher severity of lifetime suicidal ideation; and 3) There will be an indirect effect of perceived thought control in the relationship between these ruminative thought processes and suicidal ideation, whereby lack of control of one's own thoughts will explain a significant portion of the variance between increased rumination and increased likelihood and severity of ideation.

1- We did not test the relationship between suicide-specific rumination and presence of suicidal ideation, as presence of suicidal ideation was a requirement for suicide-specific rumination to be present.

CHAPTER II – METHODS

2.1 Sample:

228 Undergraduate students were recruited from the University of Southern Mississippi though the SONA system between March and December of 2022. Eligible participants were aged 18 or older and enrolled in at least one psychology class that allowed for SONA participation. 217 participants were analyzed as part of the final sample. Participant demographic characteristics can be found in **Table 2.1**. Participants were approximately 23 years old, and the majority identified themselves as Female, White, Not Hispanic or Latino, Heterosexual, and college Freshmen.

Table 2.1 Descriptive Statistics (N=217)

Age	22.7 (7.4)
Gender* (N (%))	
Female	147 (67.8%)
Male	56 (25.8%)
Trans-woman	0 (0%)
Trans-man	2 (0.9%)
Gender fluid	4 (1.8%)
Non-binary	6 (2.8%)
Unsure/declined	2 (0.9%)
Race* (N (%))	
White	150 (69.1%)
Black/African American	56 (24.4%)
Asian	11 (5.1%)
Native American/Alaksa Native	4 (1.8%)
Middle Eastern/North African	1 (<0.1%)
Pacific Islander	0 (0.0%)
Other	3 (1.4%)
Ethnicity (N (%))	
Hispanic/Latino	6 (2.8%)
Sexual Orientation* (N (%))	
Heterosexual	156 (71.8%)
Lesbian/Gay	15 (6.9%)
Bisexual	24 (11.0%)
Pansexual	10 (4.6%)
Queer	3 (1.4%)
Asexual	2 (0.9%)
Demisexual	1 (<0.1%)
Unsure/declined	5 (2.3%)
Grade (N (%))	
1st year	81 (37.3%)
2nd year	37 (17.1%)
3rd year	51 (23.5%)
4th year	35 (16.1%)
Above 4th year undergraduate	12 (5.5%)
Graduate/professional student	1 (<0.1%)

*Note: Percentages may not add to 100 as multiple options could be selected.

2.2 Procedures:

Participants were recruited through the University of Southern Mississippi's online recruitment system, SONA. Participants completed a series of questionnaires using REDCap. Questionnaires were administered in the same order for all participants, which was a demographic questionnaire followed by the rest of the questionnaires alphabetically by name. There were two attention check items (i.e., "Please answer 'A LITTLE' for this answer") included in the study. Failure to answer one or more attention check items correctly resulted in removal of that person's data. All participants received half of a credit for study participation through SONA, regardless of study completion. All procedures were approved by the University of Southern Mississippi Institutional Review Board, and all participants gave informed consent before participation in study procedures.

2.3 Materials:

2.3.1 RUMINATIVE RESPONSES SCALE (RRS; NOLEN-HOEKSEMA & MORROW, 1991)

Trait levels of depressive rumination were assessed using the RRS, which is a 22-item questionnaire assessing levels of frequency of thought about a participant's depressed mood. Questions were asked about what participants typically do while depressed. The scale was reversed to be rated from 1 *somewhat infrequently* to 4 *almost always*, where higher scores indicate higher levels of rumination. Due to the relationship between this scale and depression measures, only the brooding and reflective components were calculated (Treynor et al., 2003). The reflection and brooding subscales have

demonstrated acceptable internal consistency in past studies (reflection α =0.72; brooding α=0.77) and give similar information as the full RRS, without the additional depression items (Treynor et al., 2003). In my study, the brooding and reflection subscales demonstrated good internal consistency (reflection α =0.83; brooding α=0.88).

2.3.2 ANGER RUMINATION SCALE (ARS; SUKHODOLSKY ET AL., 2001)

The ARS was used to measure trait levels of anger rumination, that is, the level of anger rumination participants typically have in their life. The ARS consists of 19 items rated from 1 *Almost never* to 4 *Almost Always* and its total ranges from 19 to 76, where higher scores indicate higher levels of anger rumination. The ARS is related to anger in, anger out, negative affectivity, social desirability, and satisfaction with life (Sukhodolsky et al., 2001). The ARS total score has demonstrated excellent internal consistency in past studies (α=0.93; Sukhodolsky et al., 2001), as well as in the current study (α=0.94).

2.3.3 SUICIDE RUMINATION SCALE (SRS; ROGERS ET AL., 2021A)

The SRS is an 8-item self-report questionnaire that was used to measure trait levels of suicide-specific rumination. This was asked based on what participants generally do and was only given for participants who answered positively to the screener question: *Have you ever had thoughts of suicide or pictured yourself dying by suicide?* Items are rated on a scale from 0 to 4, where 0 is *Almost Never* and 4 is *Almost Always*. Total suicide-specific rumination is calculated on a scale from 0 to 32, with a higher total indicating higher levels of suicide-specific rumination. The SRS has demonstrated excellent internal consistency in its validation study (ω=0.91) and is related to history of suicide attempt, suicidal ideation, capability for suicide, as well as perceived

burdensomeness, thwarted belongingness, distress tolerance, brooding, and mindfulness (Rogers, Law, et al., 2021). In the current study, the SRS demonstrated excellent internal consistency (α=0.96).

2.3.4 THOUGHT CONTROL ABILITY QUESTIONNAIRE (TCAQ; LUCIANO ET AL., 2005)

Ability to control one's own thoughts was assessed using the TCAQ. Questions asked include *I often cannot avoid having upsetting thoughts* and *Frequently, some thoughts or images take over my mind*. The TCAQ is 25 items, rated from 1 Strongly Agree to 5 Strongly Disagree, with total scores ranging from 25 to 125. Scores were reversed such that higher scores indicate less ability to control one's own thoughts. The TCAQ has demonstrated excellent internal consistency (α=0.92) in past studies (Luciano et al., 2005). The TCAQ relates to other measures of thought control such as thought suppression, as well as symptoms of anxiety, worry, obsessive-compulsive disorder, guilt, and depression (Luciano et al., 2005). The TCAQ also demonstrated excellent internal consistency in the current study (α=0.93).

2.3.5 COLUMBIA-SUICIDE SEVERITY RATING SCALE SELF-REPORT VERSION (CSSR-S; POSNER ET AL., 2011)

Presence and severity of lifetime suicidal thinking was measured using the CSSR-S self-report version. The first five questions ask about severity of suicidal ideation ranging from passive (i.e. "Have you wished you were dead or wished you could go to sleep and not wake up?") to active with a plan (i.e. "Have you started to work out, or actually worked out, the specific details of how to kill yourself and did you actually

intend to carry out the details of your plan?"). These questions are answered yes or no. If a participant answers yes to at least one form of ideation, they are then asked about the intensity of their suicidal thoughts (i.e., extent of planning), and the frequency, duration, controllability, reasons for dying, and whether there are any deterrents to acting upon these thoughts. The total CSSR-S score ranges from 0 to 25, with higher scores indicating more severe suicidal thoughts. Presence of ideation was denoted by a score > 0 on the CSSR-S. In the current study, the CSSR-S was modified to assess lifetime and past month, with the question about suicidal behavior also asking about the most recent attempt for the purpose of assessing suicide risk (Suicide Prevention Resource Center, 2009).

The CSSR-S has been well-validated as a measure of suicidal thoughts, with use in a range of populations (e.g., different age groups, psychiatric conditions, veterans) and settings (e.g., inpatient and outpatient settings, emergency departments, primary care, forensic settings, etc.) with over 150 studies being conducted on the risk assessment protocol since 2007. The CSSR-S has been found to have excellent internal consistency in validation studies (α=0.94 (Posner et al., 2011). Importantly, the CSSR-S has also recently been found to be predictive of imminent risk of death by suicide (Bjureberg et al., 2021).

2.4 RISK PROTOCOL

The Substance Abuse and Mental Health Services Administration (SAMHSA) created a Suicide Assessment Five-step Evaluation and Triage (SAFE-T) plan to be used with the Columbia Suicide Severity Rating Scale (CSSR-S). Resources were provided at

the end of the survey for all participants and the CSSR-S was used to determine suicide risk levels following these guidelines:

2.4.1 HIGH SUICIDE RISK

This was denoted by an answer of yes to questions asking about suicidal ideation with intent in the past month, or suicidal behavior in the past 3 months. Participants in this risk category were contacted by a trained graduate clinician within 24 hours of assessment completion to do a follow-up risk assessment (clinician administered CSSR-S) and to complete a coping card. If clinician judgment after the follow-up risk assessment deemed the participant to be at imminent risk based on their clinical judgment, the graduate student contacted a licensed psychologist with over 10 years of suicide risk assessment experience (Dr. Daniel Capron) and a risk-level appropriate plan was created to ensure the participant's safety.

2.4.2 MODERATE SUICIDE RISK

This included participants who were not deemed to be high risk and had suicidal ideation with no intent in the past month or had lifetime history of suicidal behavior (but none in the past 3 months). Participants in this risk category were contacted by a trained graduate clinician within one business day of assessment completion to complete a coping card. If the participant was not reached via phone, extra resources were sent to them.

2.4.3 LOW SUICIDE RISK

This included participants who were not deemed to be high or moderate suicide risk. Resources were provided to these participants at the end of the survey.

2.5 ANALYTIC STRATEGY

Power analysis was run to determine the sample size needed to detect a medium indirect effect using G*Power Version 3.1.9.7 (Faul et al., 2009). 74 usable participants with nonzero levels of ideation were needed to detect a medium effect with 0.95 power. My final sample included 91 people who met this requirement and completed the SRS.

All analyses were run in R Version 4.0.5. Data was checked to ensure that no data was outside its appropriate range (i.e., on Likert-scale 0 to 5 items, that no answer was outside of that range). Study duration (in minutes) was checked and examined for outliers. Extremely short durations resulted in removal of the participant's data (i.e., 5 minutes) and extremely long durations were examined on a case-by-case basis to determine removal (i.e., 2 hours). Overly consistent responses (i.e., answering "A LITTLE" for each answer, even on reverse items), patterned responding (i.e., consistently answering 1, 2, 3, 4, 5), and illogical responding (i.e., answering "yes" to question about suicide attempt, then '0' for number of attempts) were examined on a case-by-case basis and removed when deemed to be due to lack of attention. Other missingness (i.e., incomplete responses to the surveys, not finishing the measures of interest) was handled via listwise deletion. Data was examined for outliers, which were defined as data outside of 1.5 times the interquartile range above or below the median, and outliers were set to the highest non-outlier value.

Overall, seven people were removed for missing one or more attention check questions. Two people were removed for not completing the survey in one sitting. Two

people were removed for completing the survey too quickly and random responding. No one was removed for overly consistent responses.

First, descriptive statistics and suicide characteristics were reported. Then Pearson correlations were run to examine the relationships between each type of rumination. Next, to test the main hypothesis, a stepwise indirect effects model was used (Baron & Kenny, 1986) using the R package 'mediation' (Tingley et al., 2019) to run a series of linear regressions with bootstrapping using 1000 iterations. Initially, the relationships between brooding, reflection, or anger rumination and presence and severity of suicidal ideation were tested. Presence and severity were tested separately, as the zero-inflated nature of suicidal thoughts often causes distorted interpretations of findings. Specifically, binomial logistic regression was used to examine the relationship between rumination and the binary outcome presence or absence of suicidal ideation, and general linear regression was run on the continuous outcome of ideation severity. In addition, as suicidal rumination can only occur in those who have suicidal thoughts, whether suicidal rumination relates to severity (but not likelihood) of suicidal ideation was tested using a similar binomial logistic regression. This involved running seven separate tests; therefore, the false discovery rate was adjusted using the Benjamini Hochberg method (Benjamini & Hochberg, 1995; Glickman et al., 2014). This method involves adjustment of the model's original p-values to reflect the number of comparisons made (in this case, seven), which decreases the likelihood of false error while increasing power as compared to adjustments such as the Bonferroni (Benjamini & Hochberg, 1995). Lastly, the analysis was re-run with sex as a covariate as there are sex differences in rates of suicidal

ideation, suicide-characteristics (i.e., method and lethality of suicide attempts), as well as rumination measures (Callanan & Davis, 2012; Johnson & Whisman, 2013; Miranda-Mendizabal et al., 2019; Nock et al., 2008).

For each significant direct effect, it was determined whether each facet of rumination was related to suicidal ideation (presence or severity) through the indirect effect of perceived inability to control one's own thoughts. Importantly, unlike Baron and Kenny's (1986) original approach, if paths a (the relationship between each form of rumination and thought control) or paths b (the relationship between thought control and presence or severity of suicidal ideation) were insignificant, the third step (full/partial mediation analysis) was still run as indicated in Hayes (2013) guidelines for mediation models. The model was considered to be fully indirect when the indirect path from in the independent variable to the dependent variable was significant, and when the mediator was accounted for, the direct effect became insignificant. A partial indirect effect was indicated by a significant indirect effect and significant direct effect once the mediator was accounted for.

CHAPTER III – RESULTS

Our final sample consisted of a significant number of participants who had reported lifetime suicidal thinking and behaviors. 135 (62%) of participants reported having had a least passive death wish, which includes thoughts of wishing that they could not be here anymore or wishing that they were dead in their lifetime. Over half (N=120; 55%) also reported lifetime suicidal thinking, with 101 (46%) having had a method, 70 (32%) with a plan, and 38 (18%) with a method, plan, and intent to act upon that plan in their life. In addition, 40 (19%) participants in the sample reported a lifetime suicide attempt, with 27 (13%) reporting more than one attempt in their life. Full suicide-related characteristics of the sample are described in more detail in **Table 3.1**.

Table 3.1 Suicide-Related Characteristics

Ideation	
Lifetime	
Passive Death Wish (N (%))	135 (62.2%)
Suicidal Thinking (N (%))	120 (55.3%)
With method, no plan or intent	101 (46.5%)
With method and plan, but no intent	70 (32.3%)
With plan and intent	38 (17.5%)
Severity of Suicidal Thinking (Mean (SD))	11.5 (5.1)
Past Month	
Passive Death Wish (N (%))	29 (13.4%)
Suicidal Thinking (N (%))	20 (9.2%)
With method, no plan or intent	14 (6.5%)
With method and plan, but no intent	8 (3.7%)
With plan and intent	3 (1.4%)
Severity of Suicidal Thinking (Mean (SD))	10.6 (4.6)
Attempt	
Lifetime	40 (18.6%)
Number of attempts (N (%))	
1	13 (6.0%)
2+	27 (12.6%)
Methods (N (%))*	
Prescribed Medication	11 (27.5%)
Unprescribed Medication	10 (25.0%)
Alcohol/illicit substances	2 (5.0%)
Sharp object	13 (32.5%)
Suffocation	2 (5.0%)
Firearm	4 (10.0%)
Train/car	1 (2.5%)
Jumping	1 (2.5%)
Other	3 (7.5%)
Lethality (Mean (SD))	
Past 3 Months	4 (1.8%)
Interrupted Attempt (N (%))	21 (9.7%)
Aborted Attempt (N (%))	38 (17.5%)
Non-Suicidal Self-Injurious Behavior (N (%))	63 (29.0%)

*Methods denoted for most lethal/ most severe attempt. Percentages will not add to 100 as multiple methods could be used for a single attempt.

3.1 CORRELATION ANALYSIS

Pearson correlations were run to examine the relationships between each type of rumination. Correlation results can be found in Figure 1. Brooding was highly correlated with reflection (r= .72, p<.001) and anger rumination (r=0.62, p<.001) and moderately correlated with suicidal rumination (r=0.48, p <.001). Reflection was highly correlated with anger rumination (r= .39, p<.001), but had no significant relationship with suicidal rumination (r= .16, p=.127). Anger rumination was highly correlated with suicidal rumination (r= .44, p<.001).

Figure 3.1 *The Relationship Between Rumination Variables*

All significant correlations are denoted with color. Blue indicates a positive relationship, where orange indicates negative relationship. Empty boxes indicate nonsignificant correlations. Brooding was highly correlated with reflection and anger rumination and moderately correlated with suicidal rumination. Reflection was correlated with anger rumination but had no significant relationship with suicidal rumination. Anger rumination was moderately correlated with suicidal rumination.

3.2 RUMINATION SUBTYPES ON PRESENCE OF LIFETIME IDEATION

Logistic regression revealed a relationship between brooding and presence of ideation (OR=1.27, Z=5.41, p <.001), such that for each one additional point a person had on the brooding subscale, there was a 1.28 increase in the likelihood of having reported lifetime ideation. There was also a relationship between reflection and presence of suicidal ideation (OR=1.34, Z=5.99, p <.001), such that for each one point higher reflection score, participants, on average, had a 1.35 higher likelihood of having reported lifetime ideation. Anger rumination was also related to presence of suicidal ideation (OR=1.06, Z=3.95, p<.001), where for each one additional point a participant had on the anger rumination total, they had a 1.07 higher likelihood of having reported lifetime ideation. These relationships held after adjustment of p-values. See **Table 3.2** for full results.

Table 3.2 Binomial Logistic Regression Examining the Relationship between Brooding, Reflection, and Anger Rumination, and Presence of Suicidal Ideation

	Odds Ratio	**Lower CI**	**Upper CI**	**Z value**	**P value**	**P-adjusted**
Brooding	1.27	1.16	1.38	5.41	<.001	<.001
Reflection	1.34	1.22	1.48	5.99	<.001	<.001
Anger Rumination	1.06	1.03	1.09	3.95	<.001	<.001

3.3 RUMINATION SUBTYPES ON LIFETIME SEVERITY OF SUICIDAL IDEATION

Linear regression revealed a positive relationship between brooding and severity of suicidal ideation such that one point higher brooding score was associated with 0.58 higher severity of lifetime suicidal ideation (β=0.58, t(139) =6.23, p <.001). There was also a positive relationship between reflection and lifetime suicidal ideation severity (β=0.47, t(139) =4.46, p <.001), anger rumination and lifetime suicidal ideation severity (β=0.15, t(143) =4.43, p <.001), and suicide rumination and lifetime suicidal ideation severity (β=0.31, t(89) =8.19, p <.001), such that a one-point higher score on each rumination subtype was associated with 0.47, 0.15, and 0.31 increases in suicidal ideation scores, respectively.

Table 3.3 Linear Regression Examining the Relationship between Brooding, Reflection, Anger Rumination, and Suicidal Rumination, and Severity of Suicidal Ideation

	Estimate	**Lower CI**	**Upper CI**	**T value**	**df**	**P value**	**P-adjusted**	**R^2**
Brooding	0.58	-0.55	1.71	6.23	139	<.001	<.001	0.22
Reflection	0.47	-0.45	1.39	4.46	139	<.001	<.001	0.13
Anger Rumination	0.15	-0.15	0.45	4.43	143	<.001	<.001	0.12
Suicide Rumination	0.31	-0.30	0.91	8.19	89	<.001	<.001	0.43

3.4 COVARYING FOR SEX

When re-running the above analyses and covarying for sex, all significant relationships remained. Sex did not significantly relate to presence or severity of suicidal ideation in any model. See full results of these covariate analyses in **Tables 3.4 and 3.5**, where covarying for sex did not change the nature of these relationships.

Table 3.4 Binomial Logistic Regression Examining the Relationship between Brooding, Reflection, and Anger Rumination, and Presence of Suicidal Ideation, Covarying for Sex

Name	Odds Ratio	Lower CI	Upper CI	Z value	P value	P-adjusted
Brooding	1.27	1.16	1.39	5.39	<.001	<.001
Sex	0.96	0.48	1.95	-0.10	.921	1.000
Reflection	1.35	1.22	1.48	6.00	<.001	<.001
Sex	1.28	0.62	2.63	0.66	.508	1.000
Anger Rumination	1.06	1.03	1.09	3.91	<.001	<.001
Sex	1.17	0.60	2.26	0.46	.642	1.000

Table 3.5 Linear Regression Examining the Relationship between Brooding, Reflection, Anger Rumination, and Suicidal Rumination, and Severity of Suicidal Ideation, Covarying for Sex

Name	Estimate	Lower CI	Upper CI	T value	df	P value	P-adjusted	R^2
Brooding					138			0.22
Brooding	0.58	-0.56	1.72	6.22		<.001	<.001	
Sex	-0.39	0.37	-1.15	-0.44		.659	1.000	
Reflection					138			0.13
Reflection	0.47	-0.45	1.39	4.46		<.001	<.001	
Sex	0.39	-0.38	1.17	0.43		.669	1.000	
Anger Rumination					142			0.12
Anger Rumination	0.15	-0.15	0.45	4.41		<.001	<.001	
Sex	-0.03	0.03	-0.08	-0.03		.977	1.000	
Suicidal Rumination					88			0.43
Suicidal Rumination	0.31	-0.30	0.92	8.10		<.001	<.001	
Sex	-0.29	0.28	-0.86	-0.37		.716	1.000	

3.5 Indirect Effect

As all rumination variables significantly predicted presence and severity of suicidal ideation, indirect effect analyses were performed examining whether perceived control of one's own thoughts (thought control) significantly indirectly explained some of

the variance in the relationship between each form of rumination and suicidal ideation. Path diagrams are found in **Figures 3.2 and 3.3**.

3.5.1 PRESENCE OF LIFETIME SUICIDAL IDEATION

3.5.1.1Brooding

The relationship between brooding and presence of lifetime suicidal ideation through thought control was examined. Path a (i.e., brooding on thought control; β= 3.08, p< .001) and path b (i.e., thought control on presence of suicidal ideation; β= 0.04, p= .010) were significant. When thought control was entered into the relationship between brooding and presence of suicidal ideation, the indirect effect was significant (β= 0.01, p=.004) and the direct effect (β = 0.02, p= .024) was still significant. Therefore, thought control partially mediated the relationship between brooding and presence of suicidal ideation. See **Figure 3.2** for full statistical relationships.

3.5.1.2 Reflection

The relationship between reflection and presence of suicidal ideation through thought control was examined. Path a (i.e., reflection on thought control; β= 2.29, p< .001) and path b (i.e., thought control on presence of suicidal ideation; β= 0.04, p=.001) were significant. In addition, when thought control was entered into the relationship between reflection and presence of suicidal ideation, the indirect effect (β= 0.01, p=.004) was significant and the direct effect (β= 0.02, p<.001) remained significant. Therefore, thought control partially mediated the relationship between reflection and presence of suicidal ideation. See **Figure 3.2** for full statistical relationships.

3.5.1.3 Anger Rumination

The relationship between anger rumination and presence of suicidal ideation through thought control was examined. Path a (i.e., anger rumination on thought control; $\beta = 0.96$, $p < .001$) and path b (i.e., thought control on presence of suicidal ideation; $\beta = 0.05$, $p < .001$) were significant. In addition, when thought control was entered into the relationship between anger rumination and presence of suicidal ideation, the indirect was significant ($\beta = 0.01$, $p < .001$), but the direct effect ($\beta = 0.00$, $p = .65$) became insignificant. Therefore, thought control fully mediated the relationship between anger rumination and presence of suicidal ideation. See **Figure 3.2** for full statistical relationships.

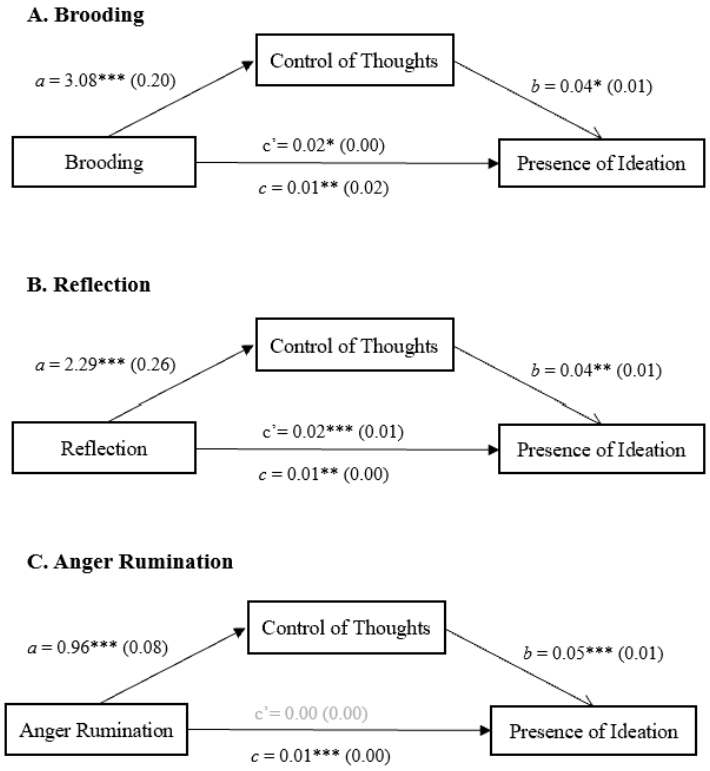

Figure 3.2 *The Indirect Effect of Perceived Control of Thoughts on the Relationships between Brooding, Reflection, and Anger Rumination and Presence of Suicidal Ideation*

Heightened levels of brooding, reflection, and anger rumination all related to higher likelihood of having reported lifetime suicidal ideation and to higher levels of perceived inability to control one's own thoughts. For brooding and reflection, the relationship between these depressive rumination subtypes and likelihood of lifetime suicidal ideation was partially explained through perceived inability to control one's own thoughts. For anger rumination, this relationship was fully explained by perceived inability to control one's own thoughts.

p<.05 *, p<.01 **, p<.001 ***

3.5.2 Severity of Suicidal Ideation

3.5.2.1 Brooding

The relationship between brooding and severity of suicidal ideation through thought control was examined. Path a (i.e., brooding on thought control; $\beta = 2.87$, $p < .001$) was significant. However, path b (i.e., thought control on suicidal ideation severity; $\beta = 0.02$, $p = .054$) was not significant. When thought control was entered into the relationship between brooding and suicidal ideation severity, the indirect effect ($\beta = 0.05$, $p = .028$) was significant but the direct effect ($\beta = 0.06$, $p = .190$) was not significant. Therefore, thought control fully mediated the relationship between brooding and suicidal ideation severity. See **Figure 3.3** for full statistical relationships.

3.5.2.2 Reflection

The relationship between reflection and severity of suicidal ideation through thought control was examined. Path a (i.e., reflection on thought control; $\beta = 1.73$, $p < .001$) and path b (i.e., thought control on suicidal ideation severity; $\beta = 0.02$, $p = .002$) were significant. When thought control was entered into the relationship between reflection and suicidal ideation severity, the indirect effect ($\beta = 0.04$, $p = .008$) was significant but the direct effect ($\beta = 0.05$, $p = .130$) became insignificant. Therefore, thought control fully mediated the relationship between reflection and suicidal ideation severity. See **Figure 3.3** for full statistical relationships.

3.5.2.3 Anger Rumination

The relationship between anger rumination and severity of suicidal ideation through thought control was examined. Path a (i.e., anger rumination on thought control;

β = 0.84, p< .001) and path b (i.e., thought control on suicidal ideation severity; β = 0.02, p= .002) were significant. When thought control was entered into the relationship between anger rumination and suicidal ideation severity, the indirect effect (β = 0.02, p= .014) was significant but the direct effect (β = 0.00, p= .916) became insignificant. Therefore, thought control fully mediated the relationship between anger rumination and suicidal ideation severity. See **Figure 3.3** for full statistical relationships.

3.5.2.4 Suicidal Rumination

The relationship between suicidal rumination and severity of suicidal ideation through thought control was examined. Path a (i.e., suicidal rumination on thought control; β = 0.75, p< .001) was significant. However, path b (i.e., thought control on suicidal ideation severity; β = 0.00, p= .973) was not significant. When thought control was entered into the relationship between suicidal rumination and suicidal ideation severity, the indirect effect (β = 0.00, p=.980) was not significant. Therefore, thought control did not mediate the relationship between suicidal rumination and suicidal ideation severity. See **Figure 3.3** for full statistical relationships.

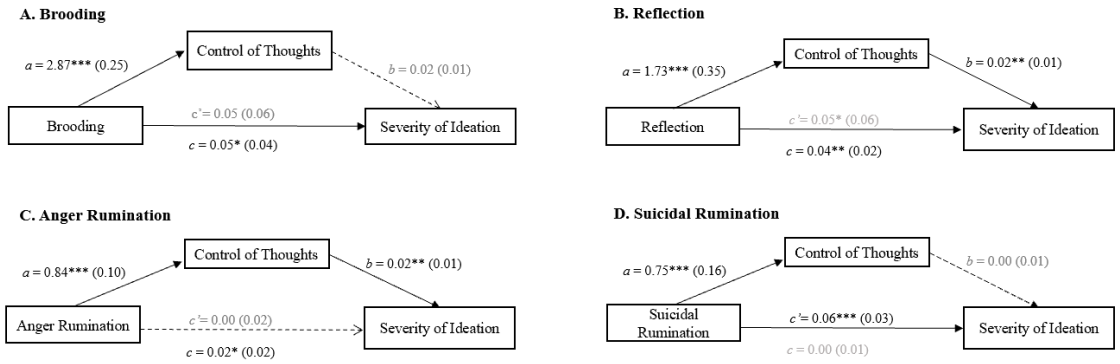

Figure 3.3 *The Indirect Effect of Perceived Control of Thoughts on the Relationships between Brooding, Reflection, Anger Rumination and Suicidal Rumination on Severity of Suicidal Ideation*

Heightened levels of brooding, reflection, anger rumination, and suicidal rumination all related to higher severity of lifetime suicidal ideation and to higher levels of perceived inability to control one's own thoughts. For brooding, reflection, and anger rumination, this relationship was fully explained by perceived inability to control one's own thoughts. Control of thoughts did not play a role in the relationships between suicidal rumination and ideation severity.

p<.05 *, p<.01 **, p<.001 ***

CHAPTER IV – DISCUSSION

The present study had two primary goals. The first was to examine the relationships between various subtypes of ruminative thought (i.e., anger, brooding, reflection, and suicidal) and presence and severity of lifetime suicidal ideation. The second was to examine whether each subtype of rumination's relationship with suicidal ideation was partially or fully explained by inability to control one's own thoughts. In this study, I found that all forms of rumination (i.e., brooding, reflection, anger rumination, and suicidal rumination) were related to presence and severity of suicidal ideation. I also found that thought control partially explained the relationships between brooding and reflection depressive rumination and presence of suicidal ideation, and fully explained the relationship between these and suicidal ideation severity. In addition, thought control fully explained the relationship between anger rumination and both presence and severity of suicidal ideation. Contrary to hypotheses, thought control did not explain the relationship between suicidal rumination and severity of suicidal ideation. These results give us insight on how rumination relates to suicidal thinking, and one mechanism that can explain this relationship (thought control).

4.1 RUMINATION AND SUICIDAL IDEATION

These results indicate that rumination not only plays a role in the presence of suicidal ideation, but also the severity of that ideation. This aligns with the Depression Distress-Amplification Model of suicide, which suggest that certain facets of affect dysregulation, such as rumination, may increase the distress associated with negative affect states, such as sadness or anger, and lead to increases in suicidal ideation (Capron

et al., 2013). Importantly, this relationship between rumination and ideation was found to exist regardless of the type of rumination, which may indicate that repetitive negative thinking subtypes have a common mechanism for increasing distress. For instance, repetitive negative thinking usually involves a component of internal/self-focus (Hamilton et al., 2015), which may limit one's ability to attend to non-negative and external information (Whitmer & Gotlib, 2013). Consistently, distinct types of repetitive negative thinking have even been associated with similar patterns of activation in the brain in areas thought to be associated with internally focused thinking (i.e., the Default Mode Network; Hamilton et al., 2015; Stern & Taylor, 2014; Zhou et al., 2020). However, despite some of these shared relationships, previous research has found that ruminative subtypes (i.e., anger and depressive) are differentially related to externalizing and internalizing psychopathology (Peled & Moretti, 2010), indicating that while some mechanisms may be shared, there are still differences in these constructs that need to be accounted for.

4.1.1 Depressive Rumination

Our finding that brooding related to presence and severity of suicidal ideation aligns with other research studies on the relationship between depressive rumination and suicide that suggest brooding's consistent and strong relationship with suicidal ideation (Rogers & Joiner, 2017). However, it has been unclear thus far whether reflection has this same relationship (Rogers & Joiner, 2017). My study found that both brooding and reflection relate to the presence and severity of suicidal thinking. I also found that this relationship with presence of suicidal ideation was partially due to brooding and

reflection increasing perceptions that people cannot control their own thoughts, however there was variance not explained by inability to control one's own thoughts. This suggests that depressive rumination may have a specific mechanism by which it relates to suicidal ideation outside of making people feel like their thoughts are uncontrollable.

For instance, depressive rumination leads to difficulties with problem-solving, avoidance of actions to actively solve problems, and worse social support (Borders, 2020; Nolen-Hoeksema et al., 2008), which have also all been associated with suicidal ideation (Chang, 2002; Harrison et al., 2010). In addition, depressive rumination has been implicated in worsening the severity of depressive symptoms (Nolen-Hoeksema et al., 2008), which makes the development of suicidal ideation and more suicidal thoughts more likely.

4.1.1.1 Brooding

Brooding involves passively focusing on one's situation and symptoms of depression (Treynor et al., 2003). My study was consistent with other studies finding that brooding is associated with suicidal ideation (Rogers & Joiner, 2017). Due to brooding's internal focus without a problem-solving component, it has been associated with numerous factors that can worsen depression symptoms, such as overly general memories of one's personal life (Romero et al., 2014). Brooding is also associated with higher levels of hopelessness, which has been found to, in turn, predict suicidal ideation (Miranda et al., 2013).

4.1.1.2 Reflection

Reflection, on the other hand, involves thinking about one's situation through a problem-solving lens (Treynor et al., 2003). Previous studies found reflection to be associated with prospective suicidal ideation, but not same-time ideation (Rogers & Joiner, 2017). In addition, there is some evidence that more reflection may be associated with more severe suicidal ideation in those with worse depression symptoms, relative to those with less depression symptoms (Cheref et al., 2015). Consistently, Whitmer & Gotlib (2013) found that it is harder to differentiate reflection and brooding in those with greater depression symptoms. Consistently, depression interferes with many facets of problem-solving (Bishop & Gagne, 2018; Lawlor et al., 2020; Visted et al., 2018), therefore the problem-solving nature of reflection may be lost in those with more severe depressive symptoms. It is possible that reflection may then be an adaptive coping strategy, except when paired with depression or experienced over long periods of time. Future studies should continue to examine the relationship between reflective depressive rumination and suicidal ideation to determine in which instances reflection may lead to the development or maintenance of suicidal thoughts.

4.1.2 Anger Rumination

In contrast to depressive rumination, very few studies have examined the relationship between anger rumination and suicidal thinking and while some studies have found a relationship (Selby et al., 2009; Uğur & Polat, 2021; Wahba & Hamza, 2022), one did not (Cho et al., 2020). Specifically, studies involving Major Depressive Disorder have found anger rumination to be higher in those with suicidal ideation than those

without (Uğur & Polat, 2021; Wahba & Hamza, 2022). Another study in undergraduates found a relationship (Selby et al., 2009), but a study using only undergraduates with high levels of borderline personality disorder traits did not (Cho et al., 2020). My study found that anger rumination was related to both the presence and severity of suicidal thoughts. This is particularly important as anger rumination is often thought to be a precursor to externalizing behaviors, such as physical and verbal aggression, as well as hostility (Anestis et al., 2009; Peled & Moretti, 2010), rather than internalizing disorders such as depression or anxiety, which are often thought to be precursors to suicidal thinking. Importantly, there is evidence to suggest that the relationship between anger rumination and internalizing is due to those with higher levels of anger rumination also having higher levels of depressive rumination (du Pont et al., 2018). Therefore, future studies should continue to examine the relationship between anger rumination and suicidal ideation and should examine to what extent this relationship is explained by shared variance with depressive rumination.

4.1.3 SUICIDE-SPECIFIC RUMINATION

Our study is also one of the first studies to confirm the relationship between suicide-specific rumination and severity of suicidal ideation in a study not including authors involved in the initial scale development. Previous studies have found evidence that suicidal rumination is related to severity of suicidal ideation, suicidal intent, and presence of past suicide attempt (Höller et al., 2022; Rogers, Gallyer, et al., 2021; Rogers & Joiner, 2018). However, no longitudinal studies or real-time monitoring studies have been done to examine these relationships. In addition, this study found that thought

control did not mediate the relationship between suicide-specific rumination and suicidal ideation severity. It is possible that this is because there is too much overlap in the measures of suicidal ideation severity and suicide-specific rumination (i.e., including aspects of frequency, duration and controllability in both). Therefore, more studies still need to be done as mechanisms by which suicidal rumination may increase suicidal ideation, or if the relationship is only unidirectional (i.e., suicidal rumination may not increase suicidal thinking, but increased suicidal thinking may lead to higher levels of suicidal rumination) are still unclear.

4.2 RUMINATION AND THOUGHT CONTROL

Our study found that each form of rumination was associated with perceptions that people are unable to control their own thoughts. Evidence suggests that while rumination is distinct from other uncontrollable thoughts, such as intrusions, (i.e., not all ruminative thoughts are involuntary, intrusive thinking is usually associated with trauma, etc.; Smith & Alloy, 2009), ruminative thoughts are often triggered as a response to external cues and situations habitually, such that rumination is automatically applied in specific situations (Watkins & Nolen-Hoeksema, 2014), which may still make it feel uncontrollable. Consistent with this hypothesis, a significant portion of people with ruminative thoughts report that these thoughts are hard to control (Joubert et al., 2022). While distraction from these ruminative thoughts may decrease distress and/or suicide risk (Nolen-Hoeksema et al., 2008; Tucker et al., 2017), attempting to control the thoughts may backfire, leading to more frequent thoughts about the topic that is meant to be avoided (Pettit et al., 2009).

4.3 THOUGHT CONTROL AND SUICIDAL IDEATION

While the role of uncontrollable thoughts of suicide has been included as an important risk factor on suicide risk assessments, the role of feeling that other thoughts are uncontrollable is still very understudied. My study is one of the first to determine that thought control plays a role in suicidal thinking. This is consistent with another study done by Rogers et al. (2021b) which found that feeling unable to control ruminative thoughts was associated with greater levels of ideation, more planning, and higher likelihood of attempt over and above other features of the ruminative thoughts. However, as participants in this study were only asked about controllability of their thoughts through the use of one item (i.e., "How often do you feel like your worry or rumination about the past is difficult to control?"), more research needs to be done to replicate and extend this finding (Rogers, Gorday, et al., 2021). In addition, more research is needed to determine which uncontrollable thoughts (i.e., affective thoughts directed towards anger or depression) increase risk for suicide.

4.4 CLINICAL IMPLICATIONS

Importantly, this study's findings do not suggest that clinicians should target ruminative thoughts by giving their clients advice such as "try not to think about it". Instead, this study indicates that techniques that remove focus from someone's internal thoughts (a key characteristic of ruminative thoughts) will likely be helpful and may give clients a greater sense of control over stopping these thoughts. For instance, distraction is a technique often used for treatment of rumination, whereby focusing on another external stimulus can break the ruminative cycle, therefore stopping the exacerbation of negative

affect (Huffziger & Kuehner, 2009). In addition, mindfulness techniques such as square breathing can be used to connect clients with their internal sensations and external situations (i.e., “Feel the wind on your face”), and thus can also be used to break this cycle (Watkins & Roberts, 2020) without creating the same cycle started through suppression.

4.5 CONSIDERATIONS FOR INTERPRETATION

Our sample was composed of primarily undergraduates. However, rates of recent and lifetime suicidal ideation and behavior in my sample were high, with over half of the sample endorsing suicidal thinking at some point in their life and almost one fifth engaging in suicidal behavior in their life. Mortier et al. (2018) suggests that closer to 33% of general college students experience suicidal ideation, with less than 5% that making a lifetime attempt. This discrepancy in suicide statistics may be explained by a few things. For one, the current sample was taken from the state of Mississippi, which is the poorest state of the United States (US Census Bureau, 2020), and half of the student population at the University of Southern Mississippi are considered low income (College Navigator, 2021). In addition, unlike the general undergraduate population, these students are more likely to be first-generation and non-traditional students (College Factual, 2023; CollegeSimply, 2022). The current sample also had high numbers of those that identified themselves to be a racial (31%) or sexual (28%) minority. Consistently, there has been significant research indicating that minority stress, or the stress faced specifically by racial or sexual minorities, are associated with suicide (Mereish et al., 2019; Meyer, 2003; Odafe et al., 2016). These findings therefore, which indicate high rates of suicidal

ideation and behavior in this unique sample, are not entirely shocking, and it aligns with past studies done in our students showing high rates of trauma (Caulfield, 2020). Importantly, while this indicates that the current sample may not be representative of the entire undergraduate population, it may instead be representative of a broader population of young adults.

Additionally, the current data was collected in 2022, which may have increased suicidality rates in this sample. A study of suicide at the University of Southern Mississippi that collected data before COVID found roughly 40% of students to endorse suicidal ideation, and approximately 22% that had a suicide attempt in the past year (Caulfield et al., 2022). However, the COVID-19 pandemic has been associated with increases in many mental health problems, including suicide attempts and death by suicide (Pathirathna et al., 2022). Therefore, these results should be interpreted with caution due to the effects of this unprecedented time.

4.6 Strengths

There are multiple strengths to the current study. Splitting the analysis of ideation into presence and severity of ideation has allowed us to observe the relationships between not just whether suicidal thoughts occurred, but also how serious (i.e., extent of planning, determination of methods), those thoughts were. In addition, as the Suicide Rumination Scale is still fairly new, my use of the scale adds evidence of internal reliability for the use of this scale and opens the pathway to further exploration of this construct. Lastly, while inability to control one's external circumstances has had significant study in relation to suicidality, inability to control one's own thoughts has not. Therefore, my use

of this measure paves the way for future study of the relationship between thought control and suicidal thinking.

4.7 Limitations

There are several notable limitations to the present study. The cross-sectional design of the study limits my ability to make temporal conclusions, therefore it is unclear if rumination leads to decreases in perceived thought control abilities, which then heighten the likelihood of developing suicidal ideation, or worsening ideation once it exists. Due to my relatively small sample size of those with recent ideation, we used lifetime ideation as the outcome. However, as rumination may not be stable across the lifespan, or stably relate to suicidality across all ages (Buerke et al., 2021; Rogers & Joiner, 2017), my use of lifetime ideation may have interfered with the ability to identify if these same relationships hold in day-to-day life. For instance, it is possible that those who had higher suicidal rumination scores on the SRS may have also had higher severity of ideation on the C-SSRS, due to the frequency of their suicidal thoughts being included in how the ideation severity variable was calculated.

4.8 Conclusions

This study examined modifiable thought processes in relation to the presence and severity of suicidal thoughts. In this study, I found that depressive rumination, anger rumination, and suicidal rumination are related to suicidal ideation and worsening of suicidal thinking. I also found that some ruminative thought processes may be related to low perceived ability to control one's own thoughts, which was associated with the presence and severity of suicidal thinking.

4.9 Future Directions

Future studies should consider using an ecological momentary assessment design to examine whether rumination leads to inability to control one's own thoughts, which leads to suicidal thinking in this order and when assessed in a more ecologically valid manner. In addition, while the relationship between rumination and suicidal ideation is still in need of further exploration, future studies should examine the role of ruminative thought processes in suicidal action (i.e., suicide attempt and death by suicide).

APPENDIX A - Questionnaires

Anger Rumination Scale

We are interested in learning about how people deal with conflict. Please choose the answer that best describes you below the following statements.

0 = Almost Never; 1 = Occasionally; 2 = Often; 3 = Almost Always

1. I ruminate about my past anger experiences.
2. I ponder about the injustices that have been done to me.
3. I keep thinking about events that angered me for a long time.
4. I have long living fantasies of revenge after the conflict is over.
5. I think about certain events from a long time ago and they still make me angry.
6. I have difficulty forgiving people who have hurt me.
7. After an argument is over, I keep fighting with this person in my imagination.
8. Memories of being aggravated pop up into my mind before I fall asleep.
9. Whenever I experience anger, I keep thinking about it for a while.
10. I have had times when I could not stop being preoccupied with a particular conflict.
11. I analyze events that make me angry.
12. I think about the reasons people treat me badly.
13. I have day dreams and fantasies of violent nature.
14. I feel angry about certain things in my life.
15. When someone makes me angry I can't stop thinking about how to get back at this person.
16. When someone provokes me, I keep wondering why this should have happened to me.
17. Memories of even minor annoyances bother me for a while.
18. When something makes me angry, I turn this matter over and over again in my mind.
19. I re-enact the anger episode in my mind after it has happened.

Columbia-Suicide Severity Rating Scale (C-SSRS) Self-Report Version

IDEATION **Check off "Yes" or "No" in the right-hand columns for each question**	**Lifetime**	
1. Have you wished you were dead or wished you could go to sleep and not wake up?	**Yes** ☐	**No** ☐
2. Have you actually had any thoughts of killing yourself?	**Yes** ☐	**No** ☐
3. Have you thought about how you might do this? *(For example, "I thought about taking an overdose but I never worked out the details about when, where, and how I would do that and I would never act on these thoughts.")*	**Yes** ☐	**No** ☐
4. Have you had any intention of acting on these thoughts of killing yourself, as opposed to you have the thoughts, but you definitely would not act on them? *(For example, "I had the thought of killing myself by taking an overdose and am not sure whether I would do it or not.")*	**Yes** ☐	**No** ☐
5. Have you started to work out, or actually worked out, the specific details of how to kill yourself and did you actually intend to carry out the details of your plan? *(For example, "I am planning to take 3 bottles of my sleep medication this Saturday when no one is around to stop me.")*	**Yes** ☐	**No** ☐

If you answered "yes" to any of the questions above, answer the following questions 6-10 (INTENSITY OF IDEATION) with respect to the highest level you answered with a "yes" above (1-5).

If none of the above questions are "yes", skip to the BEHAVIOR questions 11-18

INTENSITY OF IDEATION		Lifetime
6. How many days a week did you have these thoughts?	Less than one day a week One day a week 2-3 days a week 4-5 days a week 6-7 days a week	☐ ☐ ☐ ☐ ☐
7. How often did these thoughts usually last on the days you had them?	Just a few seconds or minutes Less than 1 hour 1-4 hours 5-8 hours More than 8 hours	☐ ☐ ☐ ☐ ☐
8. How easy was it for you to control these thoughts or push them out of your mind when you wanted to?	Easy A little difficult Somewhat difficult Very difficult Impossible; unable to control the thoughts Didn't attempt to control thoughts	☐ ☐ ☐ ☐ ☐ ☐
9. Are there things - anyone or anything (e.g., family, religion, pain of death) - that stopped you from wanting to die or acting on thoughts of committing suicide?	Deterrents definitely stopped me from attempting suicide Deterrents probably stopped me Uncertain that deterrents stopped me Deterrents most likely did not stop me Deterrents definitely did not stop me Does not apply	☐ ☐ ☐ ☐ ☐ ☐
10. What sort of reasons did you have for thinking about wanting to die or killing yourself? Was it to end the pain or stop the way you were feeling (in other words you	Completely to get attention, revenge or a reaction from others Mostly to get attention, revenge or a reaction from others	☐ ☐ ☐

couldn’t go on living with this pain or how you were feeling) or was it to get attention, revenge or a reaction from others? Or both?	Equally to get attention, revenge or a reaction from others and to end/stop the pain Mostly to end or stop the pain (you couldn’t go on living with the pain or how you were feeling) Completely to end or stop the pain (you couldn’t go on living with the pain or how you were feeling) Does not apply	☐ ☐ ☐

BEHAVIOR **Check off "Yes" or "No" in the right-hand columns for each question**	**Lifetime**
1. Have you made a suicide attempt or done anything to harm yourself because you wanted to die (even if you were not totally sure you wanted to die or just wanted to die a little bit)? *How many times has this happened?*	**Yes** **No** ☐ ☐ *Total # of times* _____
2. Have you done anything to harm yourself purely for other reasons, <u>without any intent to die</u> (like to relieve stress, feel better, get sympathy, or get something else to happen)?	**Yes** **No** ☐ ☐
3. Has there been a time when you started to do something to end your life but someone or something stopped you before you actually did anything (e.g., you had the pills in your hand but a friend stopped you from taking them)? *How many times has this happened?*	**Yes** **No** ☐ ☐ *Total # of times* _____
4. Has there been a time when you started to do something to try to end your life but you stopped yourself before you actually did anything (e.g., you took out pills but then changed your mind before you could swallow any of them)? *How many times has this happened?*	**Yes** **No** ☐ ☐ *Total # of times* _____
5. Have you taken any steps towards making a suicide attempt or preparing to kill yourself (e.g., collecting pills, getting a gun, giving valuables away or writing a suicide note)? *What have you done?*	**Yes** **No** ☐ ☐

If you answered **"yes" to question 11**, please fill out the below section (*MEDICAL DAMAGE*).
If you answered **"no" to question 11,** then you do not have any additional questions to answer.

MEDICAL DAMAGE	
6. What was the date of your most lethal or potentially lethal attempt? **Date:_____**	**Describe what you did on that date:** **On that date, please rate your medical damage from 0-4** ☐ 0. No physical damage or very minor physical damage (e.g., surface scratches). ☐ 1. Minor physical damage (e.g., lethargic speech; first-degree burns; mild bleeding; sprains). ☐2. Moderate physical damage; medical attention needed (e.g., conscious but sleepy, somewhat responsive; second-degree burns; bleeding of major vessel). ☐ 3. Moderately severe physical damage; *medical* hospitalization and likely intensive care required (e.g., comatose with reflexes intact; third-degree burns less than 20% of body; extensive blood loss but can recover; major fractures). ☐ 4. Severe physical damage; *medical* hospitalization with intensive care required (e.g., comatose without reflexes; third-degree burns over 20% of body; extensive blood loss with unstable vital signs; major damage to a vital area).

Ruminative Responses Scale

People think and do many different things when they feel depressed. Please read each of the items below and indicate, choosing a number 1-4, whether you almost never, sometimes, often or almost always think/do each one when you feel down/sad/depressed. Please indicate what you generally do, not what you think you should do.

1 = Never; 2 = Sometimes; 3 = Often; 4 = Almost Always

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

Suicide Rumination Scale

Please read each of the items below and indicate your level of agreement with which. Please indicate what you *generally* do, not what you think you should do. There are no right or wrong answers; we are interested in what you think and do.

1. Have you ever had thoughts of suicide or pictured yourself dying by suicide?
a. Yes
b. No

If yes, continue. If no, skip to end.

0 = Almost Never; 1 = Rarely; 2 = Sometimes; 3 = Often; 4 = Almost Always

When I have thoughts of suicide, I …
1. Cannot "turn off" these thoughts
2. Cannot escape these thoughts
3. Have trouble getting the suicidal thoughts out of my mind
4. Am unable to stop thinking about suicide
5. Think about how I want to kill myself
6. Imagine what killing myself with different methods would be like
7. Wonder what the fastest and easiest way to die is
8. Imagine the process of how I want to kill myself

Thought Control Ability Questionnaire

	A	B	C	D	E
1. It is often difficult for me to fall asleep because my mind keeps going over personal problems[a]					
2. I often cannot avoid having upsetting thoughts[a]					
3. Although some people criticize me unfairly, I can't help thinking they might be right[a]					
4. I manage to have control over my thoughts even when under stress					
5. I constantly censure my thoughts and actions[a]					
6. Any setback overwhelms me, no matter how small[a]					
7. I am usually successful when I decide not to think about something					
8. I constantly evaluate whether my thoughts and actions are appropriate[a]					
9. It is very easy for me to stop having certain thoughts					
10. I feel worried, frustrated or sad for a long time after having an embarrassing, troublesome or painful experience[a]					
11. It is easy for me to free myself of troublesome thoughts					
12. Frequently, some thoughts or images take over my mind[a]					
13. There are negative things in my past that I cannot help remembering[a]					
14. There are few things in life that manage to trouble me					
15. I haven't been able to get the argument I had with (my partner, my parents, a friend…) out of my head for several days[a]					
16. I consider myself a person who is good at controlling positive and negative emotions					
17. My thoughts control me more than I control them[a]					
18. There are some thoughts that enter my head without me being able to avoid it[a]					
19. My thoughts are uncontrollable[a]					
20. I am not usually overwhelmed by unpleasant thoughts					
21. I am unable to free myself from certain thoughts: e.g. "I am a failure", "I am useless", "I am no good at all", etc[a]					
22. I think other people have more control over their thoughts than I do[a]					
23. If I get angry or fight with someone, I can't stop thinking about it, and I can hardly work or concentrate[a]					
24. I get rid of uncomfortable thoughts or images almost effortlessly					
25. I have much patience, and I do not lose my composure easily					

Scoring:

A=1; B=2; C=3; D=4; E=5

[a] Reverse scored items;

APPENDIX B IRB APPROVAL

Office *of*
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NOTICE OF INSTITUTIONAL REVIEW BOARD ACTION

The project below has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services regulations (45 CFR Part 46), and University Policy to ensure:

- The risks to subjects are minimized and reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered involving risks to subjects must be reported immediately. Problems should be reported to ORI via the Incident submission on InfoEd IRB.
- The period of approval is twelve months. An application for renewal must be submitted for projects exceeding twelve months.

PROTOCOL NUMBER:	21-281
PROJECT TITLE:	Thought Patterns and their Relationship with Suicidal Thoughts and Behaviors
SCHOOL/PROGRAM	Psychology
RESEARCHERS:	PI: Morgan Buerke Investigators: Buerke, Morgan~Capron, Daniel W~Caulfield, Nicole~Karnick, Aleksandrs~Fergerson, Ava~
IRB COMMITTEE ACTION:	Approved
CATEGORY:	Expedited Category
PERIOD OF APPROVAL:	25-Jan-2022 to 24-Jan-2023

Donald Sacco Jr.

Donald Sacco, Ph.D.
Institutional Review Board Chairperson

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