PATHWAYS TO COPING WITH EXTREME EVENTS: A STUDY OF THE RELATION BETWEEN COGNITIVE FLEXIBILITY AND FOUR TYPES OF RUMINATION

by

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ABSTRACT

TARYN C. GREENE. Pathways to coping to with extreme events: A study of the relations between cognitive flexibility and four types of rumination. (Under the direction of DR. CHARLIE L. REEVE)

This study investigated the degree to which cognitive flexibility (CF) is related to rumination as part of the overall coping process. We sought to test four hypotheses concerning the relationship between global CF and four specific types of rumination (deliberate, intrusive, reflective, and brooding rumination.) We also aimed to investigate relations between the three facets of CF and each type of rumination from an exploratory standpoint. Participants completed the Cognitive Flexibility Scale, the Events Related Rumination Inventory, and the Ruminative Responses Scale-Revised. Multivariate regression analyses were used to examine the relationships between CF and each style of rumination. Results confirmed our predictions that global CF would be positively related to deliberate and reflective rumination, and negatively related to intrusive and brooding rumination. Examination of unique relations between the three facets of CF (perspective shifting, problem solving, and self-efficacy) and rumination showed that perspective shifting was positively related to all forms of rumination, problem solving was negatively related to all forms of rumination, and self-efficacy was only (negatively) related to brooding. That the unique aspects of the CF facets are related to rumination in opposite ways suggests that the cognitive aspects of rumination are not fully understood. Future research should focus on further construct clarification of rumination which may yield a more holistic set of rumination factors (e.g., reveries, daydreaming, mindfulness).

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CHAPTER 1: INTRODUCTION

Cognitive processes play an important role in an individual's ability to cope with daily stressors as well as stressful and traumatic events (Cann, Calhoun, Tedeschi, Triplett, Vishnevsky & Lindstrom, 2011; Watkins 2008). A particular type of cognitive processing termed repetitive thinking, but more commonly known as rumination, often occurs in response to stress. Rumination has acquired a negative connotation across psychological literature in recent years, but rumination is generally defined as "a class of conscious thoughts that revolve around a common instrumental theme and that recur in the absence of immediate environmental demands requiring the thoughts" (Martin & Tesser, 1996). Rumination is actually a form of repetitive thinking and can be conceptualized as a multidimensional construct. Dimensions can include frequency of thought, controllability of thought (e.g., intrusive vs. deliberate), temporal orientation (focused on the future or the past), valence (positive, neutral, negative) and more. As such, rumination can have either constructive or unconstructive consequences (Watkins, 2008). For example, uncontrolled highly repetitive negative thoughts about the past may lead to maladaptive outcomes such as increased stress, guilt and negative coping behaviors. In contrast, controlled and deliberate problem-solving focused thoughts about the future may lead to more positive outcomes.

Why and how individuals manifest certain ruminative behaviors varies based on a variety of personal factors. For example, since individual attentional control strategies are considered stable and trait-like, one's tendencies for deploying attentional control can affect the amount of time spent ruminating (Van Calster, D'Argembeau, & Majerus, 2018; Irons & Leber, 2018). Similarly, decisions to employ emotion regulation strategies,

which are both habitual (trait-based) and influenced by one's state of mind (state-based) can influence the process of rumination (Ganor, Mor, & Huppert, 2018).

1.1 Rumination

In 1996 Martin and Tesser proposed a theory of rumination meant to be inclusive of the many dimensions of rumination that appeared within psychological literature at the time. They described rumination as a goal oriented cognitive process, with anticipated goals typically becoming the "motivational base" for rumination (Martin & Tesser, 1996). Rumination generally ceases when rumination focused goals are obtained. Rumination can be multi-causal and other mechanisms, such as difficulty with thought suppression or emotion induced shifts in attention, may also lead to rumination. Martin and Tesser (1996) suggested a priority assigned to ruminative thought content, even if the content was initiated by aforementioned processes. Thoughts most likely to break through one's inhibition or to accompany emotional responses, and to therefore become ruminations, are those associated with priorities or goals. Martin and Tesser also proposed rumination be conceptualized as part of a continuum, and that there is not necessarily a clear distinction between ruminative thought versus non-ruminative thought.

Despite this more broad view of rumination as a multi-valenced process (i.e., rumination in and of itself is not necessarily tied to only negative events), the construct has typically been conceptualized in the psychological literature as a predominantly negative and maladaptive cognitive process (Garcia, Duque, & Cova, 2017). Treynor et al., historically studied rumination for its role in the maintenance of depression and provided empirical evidence for a two-factor model of rumination in 2003 (Treynor,

Gonzalez, & Nolen-Hoeksema, 2003). One style of ruminating, deemed "brooding rumination", is described as a passive comparison of one's current situation with some unachieved standard (Treynor, Gonzalez, & Nolen-Hoeksema, 2003). Brooding rumination is associated with more depression in the short and long term, and is generally considered to be maladaptive (Treynor et al., 2003; Joormann & Gotlib, 2010). The second style of rumination, termed "reflective rumination" is described as a purposeful turning inward to engage in cognitive problem solving in order to alleviate one's depressive symptoms. This type of rumination was found to be associated with less depression over time, (but more depression in the short-term) and is now known to lead to effective problem solving and a greater chance for recovery (Treynor et al., 2003; Arditte & Joormann, 2011). Reflection and brooding appear distinguished from one another based on the sense of personal control over, as well as the valence of the content of the rumination.

In 2011 another two-factor model of rumination emerged among posttraumatic growth researchers. Cann et al. (2011) described two types of ruminative responses that occur following a traumatic event: intrusive and deliberate rumination. Deliberate rumination, which is characterized by voluntary engagement with thoughts about what has happened and trying to understand events and their implications, has been associated with posttraumatic growth (Cann et al., 2011). Alternatively, intrusive rumination, defined as unsolicited invasions of one's cognitive world, or automatic thoughts that the individual does not choose to bring to mind, tends to be associated with ongoing distress related to a trauma that was experienced (Cann et al., 2011). It has been proposed that intrusive and deliberate ruminations play different, potentially complimentary, roles in

influencing the outcomes of highly stressful experiences (Calhoun, Cann, & Tedeschi, 2010.) Intrusive and deliberate ruminations, similar to reflection and brooding, appear distinguished from one another on the basis of one's sense of personal control over the rumination, as well as the valence of the content of the rumination.

Based on the definitions alone, it is not clear if these distinctions represent four different types of rumination, or if there is construct overlap. To assess this, Garcia et al. (2017) tested three different factor models: a) a four-factor model where each type of ruminating constitutes an individual construct, b) a two-factor model encompassing adaptive rumination (reflection and deliberate) and maladaptive rumination (brooding and intrusive), and c) a two-factor model encompassing depressive rumination (brooding and reflection) and posttraumatic rumination (intrusive and deliberate). The four-factor model had the best statistical fit to the data in their sample, consistent with the idea that rumination can be conceptualized as having 4 distinct types or facets (Garcia et al., 2017).

As mentioned above there are various consequences to the act of rumination and these can be either constructive or unconstructive. Unconstructive consequences include depression, anxiety, and difficulties in physical health; while constructive consequences include recovery from upsetting and traumatic events, adaptive preparation and anticipatory planning, recovery from depression, and increased health-promoting behaviors (Watkins, 2008). It is safe to say that how one ruminates influences the consequences of the rumination and therefore, the individual's ability to cope with stressors and stressful events (Garcia et al., 2017). Given this review of the literature it appears that rumination is a goal oriented cognitive process that can result in multiple

positive and negative consequences depending on individual tendencies toward different styles of ruminating. Next we investigate a cognitive aptitude that may be associated with individual styles of rumination.

1.2 Cognitive Flexibility

Although there has been variability in defining the construct of cognitive flexibility (CF) over several decades it is generally understood as an aptitude which enables flexible problem solving. CF consists of three dimensions: a) Perspective shifting, or the ability to freely shift between cognitive sets in response to changing environmental stimuli (Johnco, Wuthrich, & Rapee, 2014; Dennis & Vander Wal, 2010), b) Problem solving, or the ability to apply flexible behavior toward accomplishing a goal (Martin & Rubin, 1995) and c) Self-Efficacy, or the tendency to perceive a sense of personal control over one's situation (Ionescu, 2012; Dennis & Vander Wal, 2010). The first dimension, perspective shifting, manifests as the ability to generate and/or perceive multiple alternative ideas about or solutions for life situations (Dennis & Vander Wal, 2010; Johnco et al., 2014). The second dimension, problem solving, manifests as inhibiting habitual responses in favor of alternative responses when required by changing environmental circumstances (Johnco et al., 2014). The third dimension, self-efficacy, manifests as a tendency to perceive things as controllable (Dennis & Vander Wal, 2010).

Researchers typically contrast cognitive flexibility with what is thought of as the opposite construct, inflexibility or rigidity. Cognitive rigidity is thought of as the tendency of an individual not to change or shift mental sets despite changing environmental circumstances (Ionescu, 2012). Cognitive rigidity is related to a host of psychopathological symptoms associated with depression, anxiety, and posttraumatic

stress disorder (Miranda & Nolen-Hoeksama, 2007; Teasdale, Moore, Hayhurst, Pope, Williams, & Segal, 2002; Hijazi, Keith, & O'Brienn, 2015). In contrast, individuals who possess high levels of cognitive flexibility are more likely to react adaptively in response to encountering difficult life experiences (Dennis & Vander Wal, 2010), to pursue and complete complex tasks (Ionescu, 2012), to be creative (Ionescu, 2012), and to efficiently solve problems (Ionescu, 2012).

1.3 The Current Study

The purpose of the present research was to investigate the degree to which cognitive flexibility is related to the rumination. Specifically, we sought to test four hypotheses, illustrated in Figure One: Expected correlations between global CF and four types of rumination, concerning the relationship between global CF and the specific dimensions of rumination. Second, we sought to empirically explore the degree to which the sub-facets of CF are differentially related to the four types of rumination.

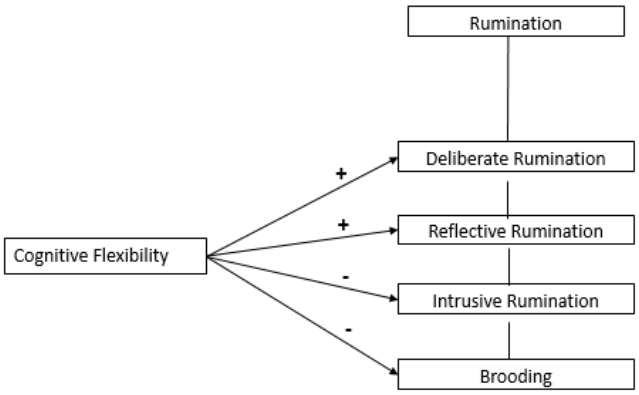

Figure One: Expected correlations between global CF and four types of rumination

First, we expected differences in cognitive flexibility to have a positive relationship with deliberate rumination. The literature reviewed above suggests that CF is an aptitude-like construct which involves both the ability to apply flexible behavior

toward accomplishing a goal (an ability) and the tendency to perceive a sense of personal control over one's situation (a perception). Deliberate rumination appears to match these characteristics as it is a cognitive process whereby one voluntarily engages in repetitive thinking with an aim at understanding and engaging in problem-solving. We predicted a moderate positive relationship between CF and deliberate rumination. Similarly, we expected cognitive flexibility to be positively related to reflective rumination. Prior research suggests both CF and reflective rumination involve purposefully turning inward to engage in cognitive problem solving. Thus, similar to deliberative rumination, we expected a moderate positive relationship to emerge between CF and reflective rumination.

Third, we expected cognitive flexibility to be negatively related to intrusive rumination. CF involves a sense of personal control and an ability to flexibly adapt thinking in response to environmental stimuli, whereas intrusive rumination is typified by lack of control over one's thoughts including involuntary engagement with thoughts that are distressing. Therefore we predicted a moderate negative relationship between CF and intrusive rumination.

Last, we expected cognitive flexibility to be negatively related to brooding rumination. Whereas CF involves the ability to freely shift between cognitive sets in response to changing environmental stimuli and the ability to apply flexible behavior toward accomplishing a goal, brooding rumination is characterized by the passive (unintentional) comparison of one's current situation with some unachieved standard. Thus, we expected a negative relationship to emerge between CF and brooding rumination.

Finally, we sought to explore the relative contribution of each of the three facets of CF (perspective shifting, problem solving, and self-efficacy) to each type of ruminating. Whilst the three facets of CF are likely be positively correlated, and thus show similar directional relations with rumination, we expect that the three facets will not be equally related to each type of rumination. However, at this time the extant literature does not yield sufficient data to generate more precise hypotheses regarding differential weighting of the facets. Our goal here is to provide an empirical contribution to the literature to spur further theory driven research in the future.

CHAPTER 2: METHODS

2.1 Participants

Participants were users of Amazon's Mechanical Turk (MTurk), a participant recruitment website that is open to the national population (Buhrmester, Kwang, & Gosling, 2011). MTurk samples have been found to be more representative of the national population than standard American college samples and other internet samples (Buhrmester et al., 2011). Inclusion criteria included being 18 years or older, as well as residing in the United States (as our survey was offered through Amazon's MTurk). A total of 218 individuals started the Qualtrics survey. However, 10 cases were removed because they failed to complete the survey, and two duplicate IP addresses were identified (resulting in deletion of four additional cases). A minimum completion-time criteria of 180 seconds (3 minutes) was established, resulting in the deletion of four more cases. Finally four additional cases were removed due to not following instructions or using a response set of giving the same response to each item across multiple surveys (see Table 1 for demographic information).

2.2 Procedure

This study was a cross-sectional, correlational study. Participants completed study measures once through the MTurk database system and were paid a fee of $1.50 for completing the survey. Participants were informed that they could withdraw from participation at any time, but that would forfeit their fee per MTurk guidelines. Informed consent was obtained via participants clicking an electronic box indicating "I agree" to the presented consent form. Following consent, participants completed study measures to include the Cognitive Flexibility Sale (CFS), the Ruminative Response Scale-revised

(RRS-r), the Events Related Rumination Inventory (ERRI), and a demographics questionnaire. Approval for this study was obtained from the Institutional Review Board (IRB Number 19-0248).

2.3 Measures

Demographics. A demographics questionnaire was used to collect information about age, gender, ethnicity/race, school status/major, marital status, income, history of mental health diagnosis, history of neurological illness, and history of loss of consciousness.

Cognitive Flexibility. Cognitive Flexibility was assessed via the Cognitive Flexibility Scale (CFS) (Martin and Rubin, 1995), a 12-item self-report measure designed to tap all three facets of CF. Respondents were instructed to answer each item by focusing on their beliefs and feelings about their behavior. Each item was rated on a six point scale with participants indicating the number that best represents their agreement with each statement (1 - "strongly disagree" to 6 - "strongly agree"). Perspective shifting is assessed via items such as "*I have many possible ways of behaving in any given situation.*" Problem solving is assessed via items such as "*I avoid new and unusual situations (reversed).*" Self-efficacy is assessed via items such as "*My behavior is a result of conscious decisions that I make.*" Each facet of CF is assessed via four individual items with some items requiring reverse scoring. Average response scores were calculated for each participant resulting in an overall cognitive flexibility scaled score between 1 and 6. Higher scores indicate more cognitive flexibility. Average response scores were also calculated for each of the three facets. The CFS is reported to have good construct validity and good criterion validity as evidenced by positive relationship between high scores on the CFS and confidence in performing communication behaviors

(Martin & Anderson, 1998). Convergent validity was reported as acceptable with scores on the CFS being positively related to scores on the Communication Flexibility Scale which measures behavioral flexibility (Martin & Anderson, 1998). Discriminant validity was reported as adequate with scores on the CFS being negatively related to scores on the Rigidity of Attitudes Regarding Personal Habits Scale (Martin & Anderson, 1998). The CFS demonstrated high test–retest reliability for 1 week (r = .83) (Martin & Rubin 1995).

Intrusive and Deliberate Rumination. Intrusive and deliberate rumination were assessed via the Event Related Rumination Inventory (ERRI) (Cann et al., 2011), a 20-item self-report measure with 10 items assessing each type of rumination. For intrusive rumination respondents were instructed to indicate how often they had specific experiences such as "*I could not keep images or thoughts about the event from entering my mind during the weeks immediately following an event*" using a six point scale (1 – "not at all" to 5 – "extremely often"). For deliberate rumination respondents were instructed to indicate how often they deliberately spent time thinking about the issues indicated during the weeks immediately after a highly stressful event using a six point scale (1 – "not at all" to 5 – "extremely often"). Deliberate rumination is assessed via items such as: "*I forced myself to think about my feelings about my experience."* Average response scores were calculated for intrusive and deliberate rumination for each participant resulting in scaled scores between 1 and 5. Higher scores indicate more of each respective type of rumination. The ERRI has demonstrated strong internal consistency (intrusive a_.94, deliberate a_.88) and high internal reliability across three separate samples (Cann et al, 2011). It has demonstrated excellent convergent validity with measures of overlapping constructs (tendencies to engage in self-analysis (PSCS),

intellective meaning-seeking thoughts (RRQ reflection), and more neurotic threat based thinking) as well as acceptable discriminant validity with ERRI factors not seriously overlapping with stable differences such as personality (Cann et al, 2011).

Reflective and Brooding Rumination. Reflective and brooding rumination were assessed via the revised Ruminative Responses Scale (RRS-revised) (Treynor et al., 2003). This scale is a 10-item self-report measure, with 5 items assessing each type of rumination. Respondents were instructed to answer each item by focusing on their thoughts and each item is rated on a four point scale with participants indicating overall how often they experience each response (1 – "almost never" to 4 – "almost always"). For three reflective rumination items part of the original instructions (focusing on thoughts related to "when you feel sad, blue, or depressed") was replaced with more neutral emotive language such as "think about how you feel" in an effort to reduce association of items with depression. Scale level scores were computed as average item scores so as to retain the item level metric. Higher scores indicate more of each type of rumination. Reflective rumination is assessed via items such as: *Analyze recent events to try to understand how you feel*. Brooding rumination is assessed via items such as: *Think "Why do I always react this way?"* The RRS-revised is highly related to the full version (r = 0.90) with high internal reliability (alpha = 0.85) (Nolen-Hoeksema, Larson, & Grayson, 1999; Nolen-Hoeksema & Morrow, 1991; Nolen-Hoeksema, Parker, & Larson, 1994). The RRS also demonstrated strong test–retest correlation (r = .80) over a six-month period (Luminet, 2004).

CHAPTER 3: RESULTS

Descriptive statistics and zero-order correlations for the focal variables under study are reported in Table 2. Descriptive statistics indicate that all means for the rumination scales were within a reasonable range and standard deviations indicated acceptable variability in responses, given our variables. The sample demonstrated a somewhat high mean on the cognitive flexibility scale (M = 4.75 on a scale of 1-6) indicating possible over-reporting, although the standard deviation for this scale suggested sufficient variability in responses.

To further investigate the integrity of our data we investigated the pattern of zero-order correlations. With regard to the four forms of rumination, we expected the strongest relationship to emerge between deliberate and reflective rumination as these two facets share similar characteristics involving high control and positive valence of rumination content. Indeed, deliberate and reflective rumination were significantly, positively correlated with one another (r = .47, p < .01). We also expected intrusive and brooding rumination to demonstrate a strong positive relationship, as both involve low control and negative valence rumination content. The data revealed that these two facets do relate strongly to one another (r = .32, p < .01). We also expected facets from the same scales to show stronger relations with one another due to method variance. Indeed, deliberate and intrusive rumination demonstrated a strong, positive relationship (r = .51, p < .01), as did reflection and brooding (r = .33, p < .01). Finally, as expected, the weakest associations were between the scales sharing neither similar characteristics (e.g., DR and Brooding) nor the same method (i.e., not from the same scale). Of note, when asked to bring to mind a notable experience the majority of participants called to mind a positive experience

(62%), and 85% of the sample rated the event they brought to mind as high or extremely high in significance.

The pattern of zero-order correlations largely supports three of our four hypotheses (See Table 2). As expected, CF is positively related to both deliberate and reflective rumination, supporting the first two hypotheses, though the relationship between CF and reflection was only of a small magnitude rather than moderate as predicted (r = .16, p < .05, respectively).

Second, CF is negatively related to both intrusive and brooding rumination, though there was not a significant relationship between CF and intrusive rumination (r = -.08, p = .26). Thus, only one of the last two hypotheses was confirmed. Interestingly, the relationship between CF and brooding emerged as the strongest amongst the four examined (r = -.43, p < .01).

To further understand the nature of the observed relations between the global measure of CF and rumination, we sought to explore the relative contribution of each of the three facets of CF (perspective shifting, problem solving, and self-efficacy) to each type of rumination. To do this, each form of rumination was regressed upon the three facet scores of the CF using simultaneous entry multiple regression. Results are reported Table 3. The three facets of CF were positively correlated, as expected.

Deliberate Rumination and Reflection: Based on zero-order correlations CF exhibited a stronger relationship with deliberate rumination than with reflective. However, when the unique contributions of each of the three facets of CF were considered, we found that CF accounted for the same percent of variance in each (R^2 = .10 for both). For both forms of rumination, perspective shifting yielded the strongest

unique impact (deliberate: ß = .42, p < .01; reflective: ß = .43, p < .01). In contrast, the unique effect of self-efficacy was nil for both. Interestingly, for reflection only, when perspective shifting and self-efficacy were held constant, problem solving shows a moderate negative impact on reflection (ß = -.27, p < .05).

Intrusive Rumination and Brooding: When we investigated the relationship of the global CF measure with intrusive rumination we did not observe a significant effect. However, when the unique contributions of each of the three facets of CF were explored we found the total effect on intrusive rumination was significant (R^2 = .07, p < .01). In terms of unique impact, perspective shifting yielded moderate positive impacts on both intrusive and brooding ruminations (intrusive: ß = .27, p < .05; ß = .31, p < .01). Additionally, when perspective shifting and self-efficacy were held constant, the unique effect of problem solving emerged as negative, and large in magnitude (intrusive: ß = -.38, p < .01; brooding: ß = -.40, p < .01). Self-efficacy once again showed no effect on intrusive rumination; however, it did demonstrate a large negative unique effect on Brooding (ß = -.37, p < .01).

CHAPTER 4: DISCUSSION

The study largely supported our predictions that CF would be positively related to deliberate and reflective rumination, but negatively related to intrusive and brooding rumination. When using the global measure of CF, these predictions were largely supported. However, the analysis of the unique relations between the *facets* of CF and rumination reveals potentially critical information about the differential nature of various forms of rumination. Whilst the three facets of CF were positively correlated, as predicted we found that each of the three facets was not equally related to each type of rumination.

First, when we controlled for problem solving and self-efficacy, we found that perspective shifting is positively related to all forms of rumination. This relationship was expected for both deliberate and reflective rumination, which have been construed as adaptive forms of rumination by other authors, and CF is also viewed as an adaptive attribute (Garcia et al., 2017; Treynor et al., 2003; Cann et al., 2011; Dennis & Vander Wal, 2010). However, this result was unexpected for intrusive and brooding rumination, both of which are viewed as maladaptive in their respective literatures (Treynor et al., 2003; Cann et al., 2011). The positive relationship between perspective shifting and maladaptive forms of rumination suggests this facet of CF may not be sensitive to valence or control (the factors we suggested differentiate these four forms of rumination). Clinical implications of this are discussed below.

Second, net the influence of perspective shifting (and self-efficacy), we found problem solving is *negatively* related to all forms of rumination, though stronger for intrusive and brooding rumination. This suggests that, holding constant perspective

shifting and self-efficacy, having more problem solving capability may help individuals decrease the amount of time spent engaging in rumination of any type, but particularly so for intrusive and brooding ruminations. This possibly stems from the fact that problem solving is by definition a form of coping (Gutiérrez, Peri, Torres, Caseras, & Valdés, 2007). This consistently negative association may occur because those with higher problem solving skills are less likely to ruminate, in general, as they are quicker to directly solve concerns than those with lower problem solving skills who may ruminate about unsolved problems.

Third, self-efficacy was only related to brooding, and negatively so. In context of the CFS self-efficacy is defined as "a tendency to perceive a sense of personal control over one's situation." The fact that self-efficacy has no impact on reflection and deliberate rumination is surprising as these two adaptive forms of rumination involve high levels of control over one's thoughts. It does make sense that self-efficacy would be negatively related to brooding, as the construct of brooding conveys a lack of control and confidence (e.g. "why do I always react this way?" and "why can't I handle things better?"). We might have expected a similar relationship to emerge between self-efficacy and intrusive rumination. However, self-efficacy was not meaningfully related to intrusive rumination. Perhaps this is due to the nature of intrusive rumination, which is more specific to a single event (Cann et al., 2011) rather than a broad egocentric view of self (as with brooding; Treynor et al., 2003). Alternatively, this may suggest that it is the self-confidence aspect of self-efficacy, rather than control that is the putative factor.

Lastly, it is worth noting that the relationship between CF and brooding emerged as the strongest CF-rumination relationship. Additionally, brooding was the only form of

rumination sensitive to the influence of all three facets, and its relationship with each of the facets examined was large in magnitude. This suggests that CF may be a major factor in brooding rumination, a relationship that has scarcely been examined as part of the depressive literature. Only one study was found examining the relationship between CF and brooding, and the results demonstrated that deficits in set-shifting predicted greater symptoms of depression (Stange, Hamilton, Fresco, & Alloy, 2016). This only addresses the perspective shifting facet of CF and does not take into account the influences of problem solving or self-efficacy. Future research work should examine the relationships between each of the CF facets and brooding in more detail, in order to facilitate a better understanding of the nature of this relationship and how interventions targeting components of CF may be used to decrease brooding.

4.1 Implications for Clinical Work

Perspective Shifting. The positive relationship between perspective shifting and adaptive forms of rumination builds off of previous literature suggesting the importance of helping individuals struggling with depression or trauma to consider multiple ways of viewing themselves or a situation. Indeed, previous literature indicates third-person expressive writing may be an especially beneficial technique for those recovering from traumatic or highly stressful life events (Andersson & Conley, 2012). Self-compassion techniques, which often include a component of perspective shifting, are also often used with clients experiencing depression and posttraumatic symptoms (Ferrari, Hunt, Harrysunker, Abbott, Beath, & Einstein, 2019; Dahm, Meyer, Neff, Kimbrel, Gulliver, & Morissette, 2015). These interventions are therefore suggested for clinicians who wish to aid clients in *increasing* adaptive forms of rumination.

Attention must also be given to the implications of perspective shifting's positive relationship with the maladaptive forms of rumination, which implies fixed, rigid, or potentially biased, lines of thinking. For example, an individual may be able to think of multiple alternative behaviors or lines of thinking, but all these alternatives could be negative in valence or counterfactual. This challenges the implicit, albeit more typical idea of perspective shifting as an exclusively adaptive aptitude (Dennis & Vander Wal, 2010). Additionally if perspective shifting can occur automatically outside of one's control, taking several different negative approaches to viewing a situation could compound the negative experiences occurring with intrusive and brooding ruminations. Mindfulness and acceptance-based interventions may be of particular use in tempering the relationship between perspective shifting and maladaptive forms of rumination, as these techniques help clients modify both the content and process of ruminations (Hayes, 2004). These approaches are known to significantly *decrease* intrusive and brooding ruminations (Perestelo-Perez et al., 2017; Cladder-Micus, Becker, Spijker, Speckens, & Vrijsen, 2019).

Problem Solving. The negative association between problem solving and all four types of ruminating suggests that aiding clients in enhancing problem solving abilities could be a valuable therapeutic component to help patients struggling with intrusive or brooding ruminations. Development of the problem solving aptitude lends itself naturally to the use of the cognitive behavioral therapy (CBT) collaborative empiricism approach, where client and therapist act as an investigative team, first eliciting automatic negative thoughts, then testing them together, and eventually applying this approach outside of therapy. This form of treatment enables participants to adopt more concrete and specific

ways of thinking, which is known to *reduce* maladaptive forms of rumination (Watkins, 2008). Mindfulness and acceptance based interventions may also be of use in developing problem solving skills, as these interventions aim to support the client in adopting a non-combative posture towards negative thoughts (Hayes, 2004), and encourage a focus on aspects of life that are easiest to change, such as overt behaviors and life situations that generate negative emotions (Hayes, 2004).

To recap, our results suggest use of intentional perspective shifting as well as self-compassion techniques to increase adaptive ruminations. These interventions, combined with use of mindfulness and acceptance-based therapies and CBT to reduce maladaptive forms of rumination, may serve as a helpful portfolio of options for clinicians assisting clients in modifying their ruminative processes. Brief assessment tools like the ones used in this study may also aid clinicians in narrowing down which of these interventions would be appropriate, based on a client's tendencies toward employing CF and ruminating. Mindfulness and acceptance-based therapies are commonly employed approaches for many psychopathologies, and therefore our unique findings demonstrate that intentional perspective shifting and self-compassion techniques may add value to current approaches, especially given that perspective shifting emerged as the CF facet with the most influence across styles of rumination.

4.2 Implications for Research

Traditionally most rumination studies have focused on psychopathological populations. A key purpose of this study was to examine rumination in a general population of people who have experienced affectively laden events. Although not included in our original hypotheses, a unique finding of this study was the simple fact

that the majority of participants called to mind positive experiences when asked about a significant event. More studies like this can be conducted to examine rumination not only for its roles in the maintenance of psychopathologies, but also for its contribution to adaptive cognitive processes and understanding how people ruminate about positive events.

Second, the fact that the various CF facets are related to rumination in *opposite* ways requires that researchers begin to look at facet level relations between CF and rumination rather than using global scores which would cover up these important differences. The observation of each of the three facets having different unique relationships with rumination also suggests the potential for interactive relationships. Of particular interest for future research would be to explore the potential for suppressor effects. When the individual types of rumination were regressed onto the global CFS score, CF appeared to account for much less of the variance rumination that it did when the individual types of rumination were regressed onto the CF facets. For example, regressing reflective rumination onto global CFS we found that CF accounted for only two percent of the variance in reflection. But when we regressed reflective rumination onto the set of CF facets, CF actually accounted for ten percent of the variance in reflection. This indicates the facets are distinct enough to have unique effects of rumination. We recommend further investigation into these possible interactions.

Third, at this time the extant literature on cognitive flexibility and its facets is sparse, and our exploratory findings underscore the need for a more detailed understanding of this construct and its dimensions. It remains unclear whether the CFS perspective shifting items are tapping a general repetitive thinking factor or their intended

construct. Similarly, a more detailed understanding of the problem solving facet as it is measured by the CFS, as well as possible revisions to the items measuring this construct, may lead to further opportunities to study the relationship of this facet with rumination. Lastly, researchers may also focus on clarifying the contributions of self-confidence and control to the self-efficacy facet.

Finally, the overall pattern of relations between CF facets and the four forms of rumination suggests the cognitive aspects of rumination are not fully understood. In forming our research hypotheses we expected to see some level of overlap between the "adaptive" and "maladaptive" forms of rumination drawn from depressive and posttraumatic literatures, and therefore similar relationships between these pairs and the CF facets. Our results underscore these similarities between these pairs of constructs, which suggests a further need to re-conceptualize the rumination construct in a way that transcends these diagnostic categories. Drawing on the work of Martin and Rubin (1995) and Watkins (2008) we suggest that future research in this area focus on including more broad forms of rumination such as planning, mind-wandering, and mindfulness in order to flush out a more holistic set of rumination factors.

Table One. *Sample Demographics*

Sample Size (N)	196
Age	
M	42.22
SD	10.83
Gender (%)	
Female	50
Race (%)	
Asian	3.6
Black or African American	9.2
White	84.2
Other	3.0
Ethnicity (%)	
Hispanic / Latino	5%
Not Hispanic / Latino	95%
Marital Status (%)	
Single	44.4
Married	44.4
Divorced	9.7
Widowed	1.5
Income (%)	
Less than 25k/year	29.6

Table One. *Sample Demographics* (continued)

25k - 49k/year	33.2
50k - 74k/year	24
75k or more/year	13.3

Table Two. *Descriptive Statistics and Zero-Order Correlations between Study Variables*

	M	*SD*	1	2	3	4	5
1. Cognitive Flexibility	4.75	.78	--				
2. Reflection	2.20	.66	.16[a]	--			
3. Brooding	1.96	.65	-.43[b]	.33[b]	--		
4. Deliberate Rumination	1.50	.77	.23[b]	.47[b]	.18[a]	--	
5. Intrusive Rumination	1.43	.71	-.08	.29[b]	.32[b]	.51[b]	--

Note. $N = 196$. *M* = mean; *SD* = standard deviation; [a] $p < .05$. [b] $p < .01$. Cognitive Flexibility scale ranges from 1 (strongly disagree) – 6 (strongly agree); Reflection and Brooding scale ranges from 1 (almost never) -4 (almost always); Deliberate and Intrusive Rumination scale ranges from 0 (never) -3 (often).

Table Three. *Simultaneous Entry Multiple Regression Results*

Outcome	Model	*b*	*S.E.*	ß	R^2
Deliberate					.10[b]
	(Intercept)	.04	.35		
	CF Perspective Shifting	.43[b]	.11	.42[b]	
	CF Problem Solving	-.09	.09	-.11	
	CF Self-Efficacy	-.04	.10	-.05	
Intrusive					.07[b]
	(Intercept)	1.39[b]	.33		
	CF Perspective Shifting	.26[a]	.11	.27[a]	
	CF Problem Solving	-.29[b]	.09	-.38[b]	
	CF Self-Efficacy	.02	.10	.03	
Reflection					.10[b]
	(Intercept)	1.13[b]	.30		
	CF Perspective Shifting	.38[b]	.10	.43[b]	
	CF Problem Solving	-.19[a]	.08	-.27[a]	
	CF Self-Efficacy	.02	.09	.03	
Brooding					.26[b]
	(Intercept)	3.23[b]	.27		
	CF Perspective Shifting	.27[b]	.09	.31[b]	
	CF Problem Solving	-.28[b]	.07	-.40[b]	
	CF Self-Efficacy	-.27[b]	.08	-.37[b]	

Note. $N = 196$. [a] $p < .05$. [b] $p < .01$. b = unstandardized regression coefficient; ß = standardized regression coefficient; S.E. = standard error of the unstandardized coefficient; R^2 = index of fit.

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APPENDIX A: INFORMED CONSENT

Department of Psychological Science
9201 University City Boulevard, Charlotte, NC 28223-0001

Consent to be Part of a Research Study

Title of the Project: The Role of Cognitive Flexibility in Rumination
Principal Investigator: Taryn Greene, M.A., University of North Carolina – Charlotte
Faculty Advisor: Charlie Reeve, Ph.D., University of North Carolina – Charlotte

You are invited to participate in a research study. Participation in this research study is voluntary. The information provided is to help you decide whether or not to participate.

Important Information You Need to Know

- The purpose of this study is to better understand the degree to which cognitive flexibility is related to rumination
- You will be asked to complete an online survey
- If you choose to participate it will require about 15-25 minutes of your time
- There are no foreseeable risks involved in participating in this study other than those encountered in day-to-day life
- You will receive no direct benefits from participating in this research study. However, you can earn $1.50 for completing the survey
- Participating in this study is voluntary. Even if you decide to be part of the study now, you may change your mind and stop at any time

Please read this form before you decide whether to participate in this research study. If you have any questions, please contact the principal investigator.

Why are we doing this study?
The purpose of this study is to better understand the ways in which cognitive flexibility may be related to personal rumination. Responses to this survey will be used to examine the degree to which individuals' cognitive flexibility contribute to individual styles of ruminating.

What will happen if I take part in this study?
If you choose to participate in this study, you will be asked to complete an online survey. Your time commitment will be about 15-25 minutes. During the survey you will be asked questions about your typical thoughts, feelings, and behaviors related to events in your life. You will also be asked questions about your health history and mental health.

What benefits or risks might I experience?

You will receive no direct benefits from participating in this research study. However, your responses may help us gain a better understanding of how individual cognitive flexibility levels influence the coping process toward (or away from) growth. There are no foreseeable risks involved in participating in this study other than those encountered in day-to-day life.

How will my information be protected?
Your responses to this survey will be confidential. We will not ask any questions that can be used to identify you. All study data will be stored electronically in password-protected files by trained staff; only the research team will have access to the data. In any publications of this study, we will not include any information that will make it possible to identify you.

Will I be paid for taking part in this study?
You will earn $1.50 for the completion of this study.

What are my rights if I take part in this study?
It is up to you to decide to be in this research study. Participating in this study is voluntary. Even if you decide to be part of the study now, you may change your mind and stop at any time. You do not have to answer any questions you do not want to answer. If you decide to withdraw from this study, your responses will not be retained.

Who can answer my questions about this study and my rights as a participant?
For questions about this research, contact the principal investigator: Taryn Greene by email at taryn.greene@uncc.edu or contact my Faculty Advisor, Dr. Charlie Reeve, at 704-687-1356 or by email at clreeve@uncc.edu.

If you have questions about your rights as a research participant, or wish to obtain information, ask questions, or discuss any concerns about this study with someone other than the researchers, please contact the Office of Research Compliance at 704-687-1871 or uncc-irb@uncc.edu.

Consent to Participate

Please select your choice below. You may print a copy of this consent form for your records. Clicking on the "Agree" button indicates that

- You have read the above information and understand what the study is about
- You voluntarily agree to participate
- You are 18 years of age or older

☐ Agree

☐ Disagree

APPENDIX B: STUDY MATERIALS

The following statements deal with your beliefs and feelings about your own behavior, in typical situations. Using the scale shown, indicate to what extent you agree or disagree with each statement.

	1 (Strongly Disagree)	2	3 (Slightly Disagree)	4 (Slightly Agree)	5	6 (Strongly Agree)
1. I can communicate an idea in many different ways.	○	○	○	○	○	○
2. I seldom have choices when deciding how to behave.	○	○	○	○	○	○
3. I have many possible ways of behaving in any given situation.	○	○	○	○	○	○
4. I am willing to listen and consider alternatives for handling a problem.	○	○	○	○	○	○
5. I avoid new and unusual situations.	○	○	○	○	○	○
6. I can find workable solutions to seemingly unsolvable problems.	○	○	○	○	○	○
7. I am willing to work at creative solutions to problems.	○	○	○	○	○	○
8. I have difficulty using my knowledge on a given topic in real life situations.	○	○	○	○	○	○
9. In any given situation I am able to act appropriately.	○	○	○	○	○	○
10. My behavior is a result of conscious decisions that I make.	○	○	○	○	○	○
11. I have the self-confidence necessary to try different ways of behaving.	○	○	○	○	○	○
12. I feel like I never get to make decisions.	○	○	○	○	○	○

For each statement shown below, use the scale provided to indicate how frequently you engage in that behavior. "Typically when I experience either positive or negative events I…"

	1 (Almost Never)	2 (Sometimes)	3 (Usually)	4 (Almost Always)
1. Analyze recent events to try to understand how I feel.	○	○	○	○
2. Go away by myself and think about how I feel.	○	○	○	○
3. Write down what I am thinking and analyze it.	○	○	○	○
4. Analyze my personality to try to understand how I feel.	○	○	○	○
5. Go someplace alone to think about my feelings.	○	○	○	○
6. Think "What am I doing to deserve this?"	○	○	○	○
7. Think "Why do I always react this way?"	○	○	○	○
8. Think about a recent situation, wishing it had gone better.	○	○	○	○
9. Think "Why do I have problems other people don't have?"	○	○	○	○
10. Think "Why can't I handle things better?"	○	○	○	○

Read each of the following statements. Using the scale below, select the response that best describes how true each statement is for you.

	1 (Never True)	2	3	4 (Neutral)	5	6	7 (Always True)
1. It's OK if I remember something unpleasant.	○	○	○	○	○	○	○
2. My painful experiences and memories make it difficult for me to live a life that I would value.	○	○	○	○	○	○	○
3. I'm afraid of my feelings.	○	○	○	○	○	○	○
4. I worry about not being able to control my worries and feelings.	○	○	○	○	○	○	○
5. My painful memories prevent me from having a fulfilling life.	○	○	○	○	○	○	○
6. I am in control of my life.	○	○	○	○	○	○	○
7. Emotions cause problems in my life.	○	○	○	○	○	○	○
8. It seems like most people are handling their lives better than I am.	○	○	○	○	○	○	○
9. Worries get in the way of my success.	○	○	○	○	○	○	○
10. My thoughts and feelings do not get in the way of how I want to live my life.	○	○	○	○	○	○	○

Read each statement and indicate to what extent you generally feel this way; that is, how you feel on the average.

	1 (Very Slightly or Not At All)	2 (A Little)	3 (Moderately)	4 (Quite a Bit)	5 (Extremely)
Interested	○	○	○	○	○
Distressed	○	○	○	○	○
Excited	○	○	○	○	○
Upset	○	○	○	○	○
Strong	○	○	○	○	○
Guilty	○	○	○	○	○
Scared	○	○	○	○	○
Hostile	○	○	○	○	○
Enthusiastic	○	○	○	○	○
Proud	○	○	○	○	○
Irritable	○	○	○	○	○
Alert	○	○	○	○	○
Ashamed	○	○	○	○	○
Inspired	○	○	○	○	○
Nervous	○	○	○	○	○
Determined	○	○	○	○	○
Attentive	○	○	○	○	○
Jittery	○	○	○	○	○
Active	○	○	○	○	○
Afraid	○	○	○	○	○

Read each statement and indicate to what extent you generally feel this way; that is, how you feel on the average.

	Very Slightly or Not At All	A Little	Moderately	Quite a Bit
1. I usually get very tense when I think something unpleasant is going to happen.	○	○	○	○
2. I worry about making mistakes.	○	○	○	○
3. I am hurt when people scold me or tell me that I do something wrong.	○	○	○	○
4. I feel pretty upset when I think that someone is angry with me.	○	○	○	○
5. I do not become fearful or nervous, even when something bad happens to me.	○	○	○	○
6. I feel worried when I think I have done poorly at something	○	○	○	○
7. I am very fearful compared to my friends.	○	○	○	○
8. I feel excited and full of energy when I get something that I want.	○	○	○	○
9. When I am doing well at something, I like to keep doing this.	○	○	○	○
10. I get thrilled when good things happen to me.	○	○	○	○
11. I get very excited when I would win a contest.	○	○	○	○
12. I get really excited when I see an opportunity to get something I like.	○	○	○	○
13. When I want something, I usually go all the way to get it.	○	○	○	○
14. I do everything to get the things that I want.	○	○	○	○
15. When I see an opportunity to get something that I want, I go for it right away.	○	○	○	○
16. Nobody can stop me when I want something.	○	○	○	○
17. I often do things for no other reason than that they might be fun.	○	○	○	○
18. I crave for excitement and new sensations.	○	○	○	○
19. I am always willing to try something new, when I think it will be fun.	○	○	○	○
20. I often do things on the spur of the moment.	○	○	○	○

Everyone experiences both positive and negative events in their lives. Please bring to mind a particularly notable experience from your life (such as the birth of a child or loss of a loved one). Indicate below whether you consider the event you are thinking about as a positive or negative experience.

Positive O

Negative O

Please answer the following questionnaires with respect to the specific event you brought to mind.

	Mild	Moderate	High	Extreme
How would you rate the intensity of your event?	○	○	○	○

Keeping in mind the same experience you just describe in the previous question, please indicate how often you engaged in each of the following thoughts or behaviors.

	0 (Never)	1 (Rarely)	2 (Sometimes)	3 (Often)
1. I thought about whether I could find meaning from my experience.	○	○	○	○
2. I thought about whether changes in my life have come from dealing with my experience.	○	○	○	○
3. I forced myself to think about my feelings about my experience.	○	○	○	○
4. I thought about whether I have learned anything as a result of my experience.	○	○	○	○
5. I thought about whether the experience has changed my beliefs about the world.	○	○	○	○
6. I thought about what the experience might mean for my future.	○	○	○	○
7. I thought about whether my relationships with others have changed following my experience.	○	○	○	○
8. I forced myself to deal with my feelings about the event.	○	○	○	○
9. I deliberately thought about how the event had affected me.	○	○	○	○
10. I thought about the event and tried to understand what happened.	○	○	○	○
11. I thought about the event when I did not mean to.	○	○	○	○
12. Thoughts about the event came to mind and I could not stop thinking about them.	○	○	○	○
13. Thoughts about the event distracted me or kept me from being able to concentrate.	○	○	○	○
14. I could not keep images or thoughts about the event from entering my mind.	○	○	○	○
15. Thoughts, memories, or images of the event came to mind even when I did not want them.	○	○	○	○
16. Thoughts about the event caused me to relive my experience.	○	○	○	○
17. Reminders of the event brought back thoughts about my experience.	○	○	○	○
18. I found myself automatically thinking about what had happened.	○	○	○	○
19. Other things kept leading me to think about my experience.	○	○	○	○
20. I tried not to think about the event, but could not keep the thoughts from my mind.	○	○	○	○

The following demographic questions are for research purposes only.

1. What is your gender?
   - ○ Male
   - ○ Female
   - ○ Gender Non-Binary
   - ○ Other

2. What is your race?
   - ○ American Indian/Alaska Native
   - ○ Asian
   - ○ Native Hawaiian/Other Pacific Islander
   - ○ Multiracial
   - ○ Black or African American
   - ○ White
   - ○ Other

3. What is your ethnicity?
   - ○ Hispanic/Latino
   - ○ Not Hispanic/Latino

4. Please enter you age in years. ____

5. What is your current marital status?
   - ○ Single
   - ○ Married
   - ○ Divorced
   - ○ Widowed

6. What is your typical annual income?
   - ○ Less than $25,000
   - ○ $25,000 to $49,999
   - ○ $50,000 to $74,999
   - ○ $75,000 or more

7. Have you ever been diagnosed with a mental health issue?
   - ○ Yes

- ○ No

8. Have you ever been diagnosed with a neurological illness?
   - ○ Yes
   - ○ No

9. Have you had issues with loss of consciousness on a regular basis?
   - ○ Yes
   - ○ No