ABSTRACT

RUMINATION IN THE CONTEXT OF THE CENTRALITY OF STRESSFUL EVENTS

by Lucy Jane Allbaugh

Repetitive thought strategies, such as rumination, have been linked to negative outcomes following stressful events. It has been proposed that some repetitive thoughts may serve an adaptive function for some individuals. This study examined the impact of various rumination strategies on negative and positive outcomes and the centrality of an event as a context under which the nature of rumination might change. Five hundred eighty college students reported their use of brooding, reflecting, deliberate, and intrusive rumination. Outcomes measured were symptoms of depression, anxiety, and posttraumatic stress, and posttraumatic growth. With few exceptions, main effects were found for centrality and each type of rumination. Centrality moderated several relationships; those with low centrality were less impacted by the negative effects of rumination and more able to achieve posttraumatic growth. Findings highlight the importance of addressing rumination in clinical interventions and of considering centrality when employing strategies that rely on processing stress or trauma.
RUMINATION IN THE CONTEXT OF THE CENTRALITY OF STRESSFUL EVENTS

A Thesis
submitted to the
Faculty of Miami University
in partial fulfillment of
the requirement for the degree of
Master of Arts
Department of Psychology
by
Lucy Jane Allbaugh
Miami University
Oxford, OH
2013

Advisor ________________________________
Margaret O’Dougherty Wright, Ph.D.

Reader ________________________________
Aaron Luebbe, Ph.D.

Reader ________________________________
Terri Messman-Moore, Ph.D.
Table of Contents

Introduction .................................................................................................................. 1
  Rumination as a Specific Cognitive Coping Process .............................................. 2
  Prior Findings on Rumination ............................................................................. 2
  Centrality of Events: A Potential Moderator of the Adaptiveness of Various
  Subtypes of Rumination ....................................................................................... 4
  Study Aims ............................................................................................................ 5
  Hypotheses ............................................................................................................ 5

Method ....................................................................................................................... 6
  Participants ............................................................................................................ 6
  Procedures ............................................................................................................ 6
  Measures Used in the Present Study ................................................................... 7
    Experience of stress or trauma ......................................................................... 7
    Event centrality ............................................................................................... 7
    Rumination ...................................................................................................... 7
      Ruminative Responses Scale ......................................................................... 7
      Event-Related Rumination Inventory ............................................................ 8
    Depression symptoms ....................................................................................... 8
    Anxiety symptoms ............................................................................................ 8
    Posttraumatic stress disorder symptoms ......................................................... 8
    Posttraumatic growth ....................................................................................... 9

Results ...................................................................................................................... 9
  Intercorrelation of variables .............................................................................. 9
  Regression analyses ........................................................................................... 9
    Main and moderating effects for depression symptoms ................................. 10
    Main and moderating effects for anxiety symptoms ........................................ 10
    Main and moderating effects for PTSD symptoms ......................................... 11
    Main and moderating effects for posttraumatic growth ................................. 11

Discussion ............................................................................................................... 12
  Potential for rumination to serve an adaptive function .................................. 13
    Intentionality vs. intrusiveness ....................................................................... 13
    General vs. specific focus .............................................................................. 13
  The role of event centrality .............................................................................. 14
  Rumination as a unified of multi-faceted construct .......................................... 15
  Transdiagnostic implications ............................................................................ 15
  Limitations .......................................................................................................... 16
  Future research needs and clinical implications ............................................... 17

References ............................................................................................................... 18

Appendix .................................................................................................................. 22
List of Tables

1. Intercorrelation of Study Variables ................................................................. 22
2. Regression Models for predicting Depression, Anxiety, and PTSD symptoms and Posttraumatic Growth with Brooding Rumination ............................................. 23
3. Regression Models for predicting Depression, Anxiety, and PTSD symptoms and Posttraumatic Growth with Reflecting Rumination ........................................... 24
4. Regression Models for predicting Depression, Anxiety, and PTSD symptoms and Posttraumatic Growth with Intrusive Rumination ............................................ 25
5. Regression Models for predicting Depression, Anxiety, and PTSD symptoms and Posttraumatic Growth with Intrusive Rumination ............................................ 26
List of Figures

1. Hypothesized depressive, anxious, and PTSD Symptoms and brooding or intrusive rumination by centrality level. ................................................................. 27
2. Hypothesized posttraumatic growth and brooding or intrusive rumination by centrality level. ............................................................................................................ 27
3. Hypothesized depressive, anxious, and PTSD symptoms and reflecting or deliberate rumination by centrality level. ................................................................. 28
4. Hypothesized posttraumatic growth and reflecting or deliberate rumination by centrality level................................................................. 28
5. Anxiety symptoms and brooding rumination by centrality level. ................................................................. 29
6. PTSD symptoms and brooding rumination by centrality level. ................................................................. 29
7. PTSD symptoms and reflecting rumination by centrality level. ................................................................. 30
8. PTSD symptoms and intrusive rumination by centrality level. ................................................................. 30
9. Growth and brooding rumination by centrality level. ............................................................................... 31
10. Growth and reflecting rumination by centrality level. ........................................................................... 31
11. Growth and intrusive rumination by centrality level. ............................................................................ 32
12. Growth and deliberate rumination by centrality level. ........................................................................... 32
Acknowledgments

I would first like to thank the individuals who participated in this project for sharing their experiences with me. My deepest thanks go to my advisor, Margaret O’Dougherty Wright, for her enthusiasm and guidance. Margaret is an incredible mentor from whom I’ve learned so much already. I would like to thank the other members of my committee, Terri Messman-Moore and Aaron Luebbe for their thoughtful reviews and for the exciting discussions we had about this study. Aaron also provided excellent statistical assistance, as did Liz Kiel, to whom I am also grateful. Thank you to my friends and family for supporting me in all I do, and to my fabulous cohort. I’ll always be glad you all are along for this ride with me. Lastly, my unending thanks go to Andrew for his support, love, and patience, and for his genuine interest in hearing about my work.
Rumination in the Context of the Centrality of Stressful Events

Stressful and traumatic events have been linked to a variety of negative mental health outcomes including symptoms of post-traumatic stress disorder (PTSD), depression, and anxiety (Hedtke, et al., 2008; Lu, Mueser, Rosenberg, & Jankowski, 2008; Taft, Resick, Watkins, & Panuzio, 2009). Although it is well established that experiences of stress and trauma are related to negative mental health outcomes, how these symptoms develop is less well understood. In addition, research on post-traumatic growth following stressful life events suggests that particular consideration should also be given to individuals who are resilient, since not all who experience a traumatic event will also experience these negative outcomes. Current literature on transdiagnostic phenomena (such as depression and anxiety symptoms, which frequently co-occur) has suggested that underlying maladaptive emotion regulation and cognitive coping strategies may be predictive of negative outcome (Aldao & Nolen-Hoeksema, 2010, 2011; Fairburn, Cooper, & Shafran., 2003; Harvey, Watkins, Mansell, & Shafran, 2004; Hayes, Wilson, Strosahl, Gifford, & Follette, 1996), and that common mechanisms may be responsible for maintaining a variety of symptoms and negative outcomes. Adaptive emotion regulation and cognitive coping strategies have also been linked to post-traumatic growth (Tedeschi & Calhoun, 2004), implicating these processes in positive outcomes as well. The precise nature of these relationships, however, is still poorly understood. Additionally, the adaptive or maladaptive nature of particular coping strategies has been called into question (Aldao & Nolen-Hoeksema, 2011; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008; Treynor, Gonzalez, & Nolen-Hoeksema, 2003; Watkins, 2008), leaving researchers and clinicians alike to wonder exactly what might be maladaptive about these strategies, and if there are particular circumstances under which particular strategies are helpful.

Rumination as a Specific Cognitive Coping Process

Several research groups (Aldao & Nolen-Hoeksema, 2010, 2011; Aldao, Nolen-Hoeksema & Schweizer, 2010; Gratz & Roemer, 2004; Harvey, et al., 2004; Hayes, et al., 1996; McLaughlin & Nolen-Hoeksema, 2011) have explored specific emotion regulation and cognitive processes that now appear to be important in the formation and maintenance of several disorders, and show low specificity to any one disorder in particular. Rumination is an example of such a transdiagnostic cognitive coping strategy, and it has been consistently linked to negative outcomes, particularly depression. However, there are several aspects of this phenomenon that make it difficult to understand exactly how rumination is related to these negative outcomes and symptoms. First, there is some indication that the outcome of rumination may depend on the focus of the rumination. A distinction has been made between trait-like rumination and event-focused rumination. Nolen-Hoeksema (2000) described trait-like rumination as typically involving repeated thought about one’s mood, its’ possible causes, and likely consequences. In contrast, Calhoun, Cann, Tedeschi, & McMillan (2000) focused on types of rumination or repetitive thought that are specifically tied to analyzing or processing a traumatic or stressful event. There is some evidence to suggest that these various types of rumination may operate separately and affect outcomes in different ways. Specifically, trait rumination is thought to be more clearly linked to maladaptive outcomes whereas event-related rumination is hypothesized to have more adaptive potential for working through or resolving the trauma. Second, a distinction has been made by some between rumination that is deliberate or intentional and rumination that is intrusive or unintentional in nature (Treynor, et al., 2003; Calhoun, et al.,
and that a more deliberate form of rumination may better lead to positive outcomes. Last, rumination is related to memory processes in such a way that the importance of an event, or its relevance or centrality to oneself or one’s sense of identity, may also affect whether rumination is adaptive or maladaptive (Berntsen & Rubin, 2006; Boals & Schuettler, 2011; Harvey, et al., 2004). Each of these three aspects is addressed in the present study through examining various types of rumination and exploring centrality of the stressful experience as a potential moderator. It is important to note that the newer constructs of deliberate rumination or event-related rumination may not precisely fit the well-established, traditional definition of rumination (Harvey, et al., 2004; Klinger, 1996; Nolen-Hoeksema, 1991). It may be that these strategies are more consistent with a definition of repetitive thought given by Watkins (2008) and others. That said, the term rumination will continue to be used in the present study, as creators of validated measures have retained this wording (Cann, et al., 2011). It will later be discussed whether the term rumination is appropriate for all constructs examined in the present work.

Prior Findings on Rumination. Rumination is traditionally defined as repetitive thought; a stereotypical pattern of negative thinking (Harvey, et al., 2004; Klinger, 1996; Nolen-Hoeksema, 1991) which is distinguished from worry, though rumination and worry are related and found to be highly correlated (Fresco, Frankel, Mennin, Turk, & Heimberg, 2002). Rumination is also conceptually related to other cognitive coping strategies such as avoidance and distraction as well as to an inability to switch between helpful and unhelpful strategies (Nolen-Hoeksema, et al., 2008). Rumination was originally conceptualized as a one-factor construct, and was described as maladaptive for those who employed it. Nolen-Hoeksema and colleagues (Nolen-Hoeksema, 1991; Nolen-Hoeksema & Morrow, 1991, 1993) defined rumination as a stable coping pattern for those who use it, making it traditionally thought of as trait-like.

Trait-like rumination has been linked extensively to a variety of disorders including depression and anxiety (McLaughlin & Nolen-Hoeksema, 2011; Watkins & Moulds, 2007; Watkins & Teasdale, 2001) and to co-morbid depression and anxiety specifically (McLaughlin & Nolen-Hoeksema, 2011; Nolen-Hoeksema, 2000). More specifically, rumination predicts depression onset (Just & Alloy, 1997; Nolen-Hoeksema & Morrow 1993, 1994), predicts maintenance of depression symptoms (Kuehner & Weber, 1999; Nolen-Hoeksema, 2000), and does not remit with symptoms of depression, but remains after symptoms abate (Roberts, Gilboa, & Gotlib, 1998; Nolen-Hoeksema, 2000). In one prospective study, rumination was found to predict increased symptoms of dysphoria and post-traumatic stress disorder following a stressful or traumatic event (Murray, Ehlers, & Mayou, 2002). In addition to depressive symptoms, trait-like rumination is also predictive of PTSD. Longitudinally, rumination has been found to predict PTSD symptoms at one year (Ehlers, Mayou, Davies, & Roth, 1998; Holeva, 2001) and three years post-event (Mayou, 2002). Experimental studies of rumination induction have found that inducing rumination exacerbates negative mood (Nolen-Hoeksema & Morrow, 1993), negative thinking (Lyubomirsky & Nolen-Hoeksema, 1995), and poor problem solving (Lyubomirsky & Nolen-Hoeksema 1995; Lyubomirsky, Tucker, Caldwell, & Berg, 1999). Lyubomirsky et al. (1999) demonstrated that rumination may impact a number of other strategies in ways that may either inhibit or exacerbate use of other methods of coping. Because of its relationship with a wide variety of symptoms, processes, and mental health issues, rumination has been treated as a transdiagnostic process by several research groups (Aldao & Nolen-Hoeksema, 2010, 2011; Aldao, et al., 2010; Harvey, et al., 2004; McLaughlin & Nolen-Hoeksema, 2011).
Trait-like rumination has more recently been conceptualized by some as comprised of two distinct domains. These domains are referred to as reflecting and brooding rumination (Treynor, et al., 2003; Whitmer & Gotlib, 2011). Reflecting rumination has been labeled by these researchers as a potentially more adaptive form of rumination that may be more focused on problem solving, as it has a purpose (Treynor, et al., 2003). Brooding rumination, on the other hand, is defined as more passive, problematic, judgmental, and is thought to be the maladaptive component of trait-like rumination (Treynor, et al., 2003). This is also consistent with some findings using these two dimensions of rumination separately. While both types of rumination increase depressive symptoms in the short term, the brooding type of rumination is shown to increase negative symptoms more than the potentially more focused reflecting rumination, and reflecting rumination is associated with positive outcomes over time (Treynor, et al., 2003). Other research, however, has found both reflecting and brooding to be predictive of negative outcomes (Aldao & Nolen-Hoeksema, 2010; Joormann, Dkane, & Gotlib, 2006; Rawal, Park, & Williams, 2010; Siegle, Moore, & Thase, 2004), and Nolen-Hoeksema, et al. (2008) maintain that rumination is maladaptive regardless of the intention one has for it. Taken together, it is not entirely clear whether rumination is a multi-faceted, potentially adaptive, process. Given these conflicting findings, this potential difference in adaptiveness will be examined in the present study.

While there is extensive evidence that rumination, as Nolen-Hoeksema and colleagues define it, is associated with negative outcomes, there is also reason to believe that other types of repetitive thought may exist that are more adaptive in nature (Nolen-Hoeksema, et al., 2008; Watkins, 2008). Cognitive and emotional processing following traumatic events has long been considered to be an essential part of recovery (Greenberg, 1995; Horowitz, 1986; McCann, Sakheim, & Abrahamson, 1988). According to cognitive processing models, repetitive thoughts about the traumatic experience are part of the process of resolving the discrepancy between the traumatic experience and disruption of core beliefs. Reflection can help the individual make sense of the trauma, integrate new understandings into their beliefs and assumptions about others and the world, and facilitate working through the intense affect that resulted from the experience (Harber & Pennebaker, 1992; Horowitz, 1986; Janoff-Bulman, 1992). The shattering of assumptions and core beliefs that often occurs with major traumatic events, while often leading to symptoms of distress, can also potentially result in positive transformations of the self and lead to posttraumatic growth (Tedeschi & Calhoun, 2004). Posttraumatic growth typically refers to positive changes in oneself that occur as a result of struggling with and trying to make sense of a traumatic event or major life crisis that conflicts with one’s core beliefs (Calhoun, et al., 2000). Individuals who report posttraumatic growth feel that their functioning since the trauma has improved compared to their baseline functioning.

Calhoun and colleagues (Calhoun, et al., 2000) employ the term rumination to describe thoughts following a specific experienced event. In their model, rumination is defined as repetitive thought about the specific experience rather than focusing solely on one’s own internal mood state, and includes problem solving, meaning making, and ideally, resolution of the trauma or stressor. Calhoun and colleagues hypothesize that a thoughtful focus on events is a different type of rumination and may potentially be helpful rather than maladaptive (Calhoun, et al., 2000; Tedeschi & Calhoun, 2004). This type of rumination is consistent with self-regulation theory that proposes repetitive thought can be positive if it leads to problem solving and change in circumstances (Watkins, 2008). Tedeschi & Calhoun (2004) reported that event-related rumination has the potential to be more productive than depressogenic, trait-like rumination if it
is deliberate, rather than intrusive in nature. Their research revealed that deliberate event-related
rumination was related to posttraumatic growth, while intrusive event-related rumination was
more strongly related to posttraumatic distress, similar to prior findings regarding trait-like
rumination (Calhoun, et al., 2000). Use of this measure of rumination with a Japanese sample
revealed that deliberate rumination was more adaptive than the intrusive type over time (Taku,
Kilmer, Cann, & Tedeschi, 2011). Stockton, Hunt, and Joseph (2011) provided validation of the
Event Related Rumination Inventory (ERRI), and also confirmed that the intrusive rumination
items seem to tap into a less productive form of rumination than the deliberate rumination items,
and that only the deliberate items were related to posttraumatic growth.

Taken together, the findings on both trait-like and event-related rumination indicate that
some forms of rumination or repetitive thought may help lead to positive outcomes while others
likely lead to negative symptoms. Specifically, the reflecting type of trait-like rumination and
the deliberate type of event-related rumination show promise for adaptive value as they divide
rumination into a deliberate vs. intrusive dichotomy. Additionally, contrasting Nolen-Hoeksema
and Morrow’s (1991) measure of trait-like rumination with Cann and colleagues’ (2011) measure
of specific event-related rumination will contrast the focus of the rumination in order to discern
if focus of the thought is instrumental in determining the effectiveness of this strategy.

Centrality of Events: A Potential Moderator of the Adaptiveness of Various Subtypes of
Rumination

Event centrality refers to the extent to which the memory of a stressful or traumatic event
is central to one's identity (Berntsen & Rubin, 2006). The construct of event centrality is
relatively new and is still being explored. The literature that does exist on this construct,
however, reveals a complex picture in which increased event centrality is related to both
posttraumatic stress (Berntsen & Rubin, 2006; Boals & Schuettler, 2011) and posttraumatic
growth (Boals, & Scheuttler, 2011). According to Rubin and colleagues’ memory-based model
of trauma (Rubin, Berntsen, & Johansen, 2008), event centrality may be able to explain the
relationship between the experience of trauma and negative mental health outcomes as it may be
characteristics of the memory of the event, rather than the event itself, that lead to subsequent
symptomatology. Their mnemonic model has been proposed as an alternative to other models of
PTSD specifically, but other research on perceived event centrality has also linked this construct
to depression and anxiety (Berntsen & Rubin, 2006; Boals, & Schuettler, 2011; Robinaugh, &
McNally, 2011; Rubin, Boals, & Berntsen, 2008), as well as wellbeing and posttraumatic growth
(Boals & Schuettler, 2011). Thus, perceived centrality of the event may relate more generally to
mental health outcomes after an experience of trauma.

Some research has indicated that the ways in which coping and emotion regulation
strategies are related to outcomes (e.g. their adaptiveness) are context dependent, (Aldao, &
Nolen-Hoeksema, 2010; Aldao, et al., 2010). Additionally, there are memory and attention
biases that correlate with rumination, such as selective attention to and memory for negative
stimuli, particularly those that are self-relevant and auto-biographical (Harvey, et al., 2004;
Nolen-Hoeksema, et al., 2008). Thus, the experience of a traumatic event, and specifically how
central the event is to one’s identity, could be conceptualized as a context under which the
adaptiveness of a strategy like rumination might be expected to change. This paper will explore
the possibility that perceived centrality of the stressful life event moderates the use of these
varied rumination strategies as they relate to a range of outcomes.
**Study Aims**

The present study explored the potential adaptive and/or maladaptive nature of various types of rumination. Rumination was defined broadly and examined as a multidimensional construct, differentiating between unintentional, intrusive, or less controlled, and deliberately reflective subtypes of repetitive thought (Treynor, et al., 2003; Watkins, 2008) as well as between general, depressogenic rumination and event-specific rumination (Tedeschi & Calhoun, 2004). Use of these strategies was explored in individuals who reported experiencing a stressful event or trauma. Specifically, the current project attempts to differentiate adaptive from maladaptive forms of rumination following the experience of a stressor, with respect to three negative outcomes (depressive, anxious, and posttraumatic stress symptoms), and one positive outcome, posttraumatic growth. The study attempts to replicate past work on the maladaptive nature of trait-like and intrusive forms of rumination with respect to these outcomes. It further explores the potentially adaptive nature of the reflecting form of trait-like rumination and the deliberate form of event-related rumination, and considers the centrality of a stressful event as a moderator for the effectiveness of these strategies. By careful examining subtypes of event-related and trait-like rumination, this paper attempts to illuminate the risks and the benefits of specific types of repetitive thought following traumatic experiences.

**Hypotheses**

1. Rumination will be a global predictor of negative outcome. Specifically, trait-like brooding rumination and event-related intrusive rumination scores will each predict higher levels of depression, anxiety, and PTSD symptoms, whereas trait-like reflecting and event-related deliberate rumination scores will each be less strongly associated with depression, anxiety, and PTSD symptoms.

2. A main effect for rumination will also be found regarding positive outcomes. Brooding and intrusive rumination will each be negatively associated with posttraumatic growth, whereas reflecting and event-related deliberate rumination will each be positively associated with posttraumatic growth.

3. Perceived centrality of the stressful event will also be a predictor of negative outcomes. Specifically, higher total centrality of event scores will predict more depression, anxiety, and PTSD symptoms.

4. In line with prior research, perceived centrality of the stressful event will also be a predictor of positive outcome. Specifically, higher total centrality of event scores will predict higher levels of posttraumatic growth.

5. Perceived centrality of the stressor will moderate the effect of both trait-like brooding and event-related intrusive rumination on level of PTSD, depressive, and anxious symptoms. A higher level of brooding or intrusive rumination in the presence of high centrality is hypothesized to heighten risk for (or intensify) these negative symptom outcomes. Specifically, individuals who endorse high levels of event centrality and high brooding and intrusive rumination will demonstrate significantly higher levels of PTSD, depressive, and anxious symptoms in comparison to individuals who are low in event centrality endorsement and high in brooding and intrusive rumination. When brooding and intrusive rumination levels are low, the two groups will not differ significantly in symptom level (see Figure 1).

6. Perceived centrality of the stressor will also moderate the effect of both trait-like brooding and event-related intrusive rumination on levels of posttraumatic growth. A higher level of brooding and intrusive rumination in the presence of high centrality is hypothesized to decrease the
potential for posttraumatic growth compared to low intrusive or brooding rumination in the high centrality group. When centrality is low, however, high intrusive or brooding rumination will decrease posttraumatic growth compared to low intrusive or brooding rumination (see Figure 2).

7. Perceived centrality of the interpersonal stressor will also moderate the effect of both trait-like reflecting and event-related deliberate rumination on level of PTSD, depressive, and anxious symptoms. Individuals who are high in event centrality and high in reflecting or deliberate rumination will demonstrate significantly lower PTSD, depressive and anxious symptom levels than those who are high in event centrality and low in reflecting or deliberate rumination. Those low in event centrality will show more symptoms of PTSD, depression, and anxiety with high levels of reflecting or deliberate rumination than those low in event centrality and low levels of reflecting or deliberate rumination (see Figure 2).

8. Centrality is hypothesized to moderate the relationship between both trait-like reflecting and event-related deliberate rumination on posttraumatic growth. Specifically, those individuals with high event centrality and higher reflecting or deliberate rumination will show the highest levels of posttraumatic growth, significantly higher than those with high centrality and low reflecting or deliberate rumination and those with low centrality and high reflecting or deliberate rumination (see Figure 4).

9. This study will also explore how the constructs of brooding and reflecting rumination are related to the constructs of intrusive and deliberate event-related rumination respectively. It is hypothesized that reflecting and deliberate rumination will be more adaptive than brooding and intrusive rumination, and that these processes will be distinct.

Method

Participants
Participants for this project were recruited from the undergraduate population at a mid-sized, mid-western university. Past research has established that the stressful and traumatic events of college students are representative of those in the general population, and that experiences of stress and trauma are found to be quite prevalent within college student samples (Read, White, Ouimette, Colder, & Farrow, 2011; Vrana & Lauterbach, 1994). A total of 635 participants were recruited for the project, out of which 612 participants completed and submitted survey measures. Of those, 580 participants reported a traumatic or stressful event and were selected for inclusion in the present study. Participants were demographically representative of the university from which they were recruited. The sample was 60.2% female, 86.1% self-identified as Caucasian, 4.7% as African American, 1.9% as Asian, 3.2% as Hispanic, .8% as another racial or ethnic group, 2.3% as Bi- or Multi-Racial, and 1.0% declined to identify a racial or ethnic group. Mean age at time of completion was 18.7 years (range = 18-30) and family household income median was reported as between $100,000 - $150,000 per year (total sample ranged from less than $10,000 to over $200,000 per year). Over half (59.3%) were in their first year at the university.

Procedures
A university-approved recruitment mechanism was used, and this study was presented as one of a list of several options for the partial fulfillment of a course requirement. Participants were compensated for their time with partial course credit for undergraduate psychology courses at the university. Participants were given the consent form in person by research staff and
allowed to ask questions at that time. Survey instruments were completed on-line, from their residence, and at the participants' convenience. Measures used for the present study are part of a larger, cross-sectional study. The full battery of survey instruments was estimated to take 60 to 90 minutes to complete, and responses were anonymous from the time of submission. Measures assessed a variety of coping and emotion regulation strategies, outcomes (positive and negative), and factors related to the trauma and post-event cognition. The present study uses a selection of these measures. Participants were asked to identify the most stressful or traumatic event that they had experienced, and were given no limits on space in which to describe this event. Completion of this item was the sole requirement for inclusion in the present study.

Measures Used in the Present Study (see Appendix A)

**Experience of stress or trauma.** One question was used to identify the most stressful or traumatic event experienced, the language for which was designed by Williams, Davis, and Millsap (2002) for use with the Cognitive Processing of Trauma Scale, another measure in the larger study: "Please take a moment and think of the most upsetting and traumatic experiences or times of your life. They can be experiences about which you feel worried, guilty, ashamed or upset. They can include difficult events (e.g., parents’ divorce, rape, an injury or serious illness, a break-up with romantic partner) or difficult times (e.g., transition to college). They can be things that happened in the past or things that are happening now. Now, think about which of these events or experiences is the most upsetting, stressful, or traumatic for you. Please describe the event or experience here." Unlimited space was provided in which to answer this question. An additional list of stressful or traumatic events was compiled for this study based on items from the Traumatic Life Events Questionnaire (Kubany, et al., 2000) and the Stressful Life Events Screening Questionnaire (Goodman, Corcoran, Turner, Yuan, & Green, 1998). Those individuals who did not describe or report any event either in the space provided or in the checklist were removed from the sample for the present study.

**Event centrality.** To assess the centrality of the listed event, this study used a recently developed measure, the Centrality of Events Scale (CES; Berntsen & Rubin, 2006). This 20-item scale was developed to assess the extent to which a specific event is central to one's self-identity. Examples of individual items include "This event tells a lot about who I am." and "This event permanently changed my life." Each item is assessed on a 5-point likert scale ranging from “totally disagree” to “totally agree”. Total score is calculated by summing all individual item scores, and higher scores indicate that the event was more highly central. Since this measure is relatively new, it has not been widely used, but initial validation of the scale revealed an alpha level of $\alpha = .94$ for all items, and in the present study, $\alpha = .94$ as well.

**Rumination. Ruminative Responses Scale.** The Ruminative Responses Scale (RSS; Nolen-Hoeksema & Morrow, 1991) is a widely used measure of trait-like rumination, comprised of two subscales, reflecting and brooding (Treynor, et al., 2003). This 22-item scale was initially developed to measure one overall factor of trait-like rumination. Later research established that 12 of the items may measure depressive symptomatology (Treynor, et al., 2003), so these items were eliminated and the subscales of reflecting and brooding were comprised each of five of the remaining items of the scale. Examples of individual items include "How often do you think about how alone you feel?" and "How often do you think 'What am I doing to deserve this?'". Each item in the scale is assessed using a 4-point likert scale ranging from “Almost never” to “Almost always,” with higher scores indicating more rumination. Total score is calculated by taking a mean of all individual item scores, and the reflecting and brooding scores are calculated
by taking a mean of the five items comprising them respectively. Original alphas published for the total rumination scale score, reflecting, and brooding are $\alpha = .90$, $\alpha = .72$, and $\alpha = .77$ respectively (Treynor, et al., 2003), and calculated alphas obtained in the present samples are $\alpha = .95$, $\alpha = .80$ and $\alpha = .83$ respectively.

**Event-Related Rumination Inventory.** In contrast to the RRS, which assesses the more general construct of trait-like rumination, the event-related rumination inventory (ERRI; Cann, et al., 2011) is a measure designed to assess rumination in relation to a specified life event. As there is little work yet done with this construct (and this scale in particular), inclusion in this project will be an exploratory look at the use of this type of ruminative thinking as a coping strategy. The ERRI is a 20-item measure with items assessed on a 4-point likert scale ranging from “Not at all” to “Often.” Total score is calculated by summing all individual item scores, and the two sub-scales of deliberate and intrusive rumination are scored by summing the ten items included in each respective scale. Examples of individual items include “I thought about the event when I did not mean to,” (an example of intrusive rumination) and “I thought about what the experience might mean for my future,” (an example of deliberate rumination), with higher scores indicating more rumination about the event. Validation study revealed robust factors with alphas of $\alpha = .94$ and $\alpha = .88$ for intrusive and deliberate rumination respectively (Cann, et al., 2011). Calculated alphas for this sample were $\alpha = .96$ and $\alpha = .91$, for intrusive and deliberate respectively.

**Depression symptoms.** The Center for Epidemiological Studies Depression scale (CES-D; Radloff, 1977) is a widely used measure of depression symptom questions that align with the symptoms required for diagnosis of Major Depressive Disorder using DSM-IV criteria. Examples of individual items include “I felt that everything I did was an effort,” and “I felt hopeful about the future” (reverse scored). This 20-item measure is assessed on a 4-point likert scale ranging from “None of the time” to “All of the time,” and a total score is calculated by summing the individual item scores with higher scores indicative of more symptoms of depression. Published alphas have been found as high as $\alpha = .90$ (Milette, Hudson, Baron, & Thombs, 2010), and calculated alpha for this sample is $\alpha = .91$.

**Anxiety symptoms.** The Zung Self-Rated Anxiety Scale (SRS; Zung, 1971) is a scale of anxiety symptoms that align with the symptoms required for diagnosis of Generalized Anxiety Disorder using DSM-IV criteria. Examples of individual items include "I feel more nervous and anxious than usual," and “I get upset easily or feel panicky.” This 20-item measure is assessed on a 4-point likert scale ranging from “A little of the time” to “Most of the time,” and a total score us calculated by summing the individual item scores with higher scores indicative of more symptoms of anxiety. Original validation research established an alpha level of $\alpha = .73$ (Zung, 1971), calculated alpha for this sample is $\alpha = .89$.

**Posttraumatic stress disorder symptoms.** The Post-Traumatic Stress Disorder Symptom Checklist (PCL-Civilian Version; Blanchard, Jones-Alexander, Buckley, & Fomeris, 1996) is a widely used checklist of PTSD symptoms that align with the symptoms required for diagnosis using DSM-IV criteria. Examples of individual items include "Repeated, disturbing memories, thoughts, or images of a stressful experience from the past,” and “Loss of interest in things that you used to enjoy.” This 17 item measure is assessed on a 5-point likert scale ranging from “Not at all” to “Extremely.” Total score is calculated by summing the individual item scores, with higher scores indicative of more symptoms of PTSD. Published alphas have been found as high as $\alpha = .90$ (Blanchard, et al., 1996), and calculated alpha level for this sample is $\alpha = .94$. 

8
**Posttraumatic growth.** The 42-item version of the Posttraumatic growth inventory (PTGI-42; Cann, Calhoun, Tedeschi, & Solomon, 2010) is a measure designed to measure an individual’s perception that he or she has achieved growth after an experience of stress or trauma (posttraumatic growth) as well as the perception that he or she has experienced negative outcomes since the event (posttraumatic depreciation). Growth but not depreciation will be explored in the present study. A total score for growth is calculated, and items cover five distinct domains of growth: spiritual change, new possibilities in life, feeling stronger as a person, greater appreciation for life, and positive changes in the way the individual relates to others. Responses are rated on a six-point likert scale ranging from “I did not experience this change as a result of my crisis” to “I experienced this change to a great degree as a result of my crisis.” Examples of individual growth items include: “I am able to do better things with my life,” and “I put more effort into my relationships.” Scores are calculated as a mean score on each of the total and five domain scales. Original authors of the scale reported internal consistency of \(\alpha = .90\) for the total scale score, and it has been found to be \(\alpha = .89\) for this sample.

**Results**

Missing data were determined to be missing completely at random (MCAR) according to Little’s MCAR test, \(\chi^2(732) = 748.989, p = .32\) (Little & Rubin, 1987). Individuals with more than ten percent of items missing for any given measure were removed from analyses as they were considered to have too little data to reliably impute the remaining values. Remaining missing data were singly imputed using the expectation maximization algorithm with 25 iterations (Graham, 2009; Little & Rubin, 1987). Missing data were imputed at the scale and interaction level, consistent with most recent recommendations (Graham, 2009).

**Intercorrelation of Variables**

First, Pearson correlations were calculated for each possible pairing of variables (see Table 1). As expected, all negative outcomes (anxiety, depression, PTSD symptoms) were positively correlated with each other (\(r\) values range from \(0.56-0.65\)), and anxiety and PTSD symptoms (but not depression symptoms) were positively correlated with the positive outcome of posttraumatic growth (\(r = 0.17\) and \(r = 0.18\) respectively). Additionally, individual subtypes of rumination were positively correlated with each outcome. Brooding (\(r = 0.56\)), reflecting (\(r = 0.50\)), and intrusive (\(r = 0.30\)) rumination were most highly correlated with symptoms of PTSD, while deliberate rumination was most highly correlated with posttraumatic growth (\(r = 0.54\)). Among the subtypes of rumination, the two trait-like rumination subtypes of brooding and reflecting were more highly correlated with each other (\(r = 0.66\)) than with the event-related rumination types of intrusive and deliberate rumination (\(r\) values range from \(0.27-0.36\)). Similarly, the event-related rumination types were most highly correlated with each other (\(r = 0.65\)) than with the trait-related rumination types. Centrality, as predicted, was highly correlated with all outcomes (\(r\) values range from \(0.24-0.45\)) and with use of each of the types of rumination (\(r\) values range from \(0.31-0.54\)).

**Regression Analyses**

Data were analyzed with the four rumination scores (brooding, reflecting, intrusive, and deliberate rumination) and the centrality of event score as the independent variables and the four outcomes (depressive, anxious, and posttraumatic symptoms, and posttraumatic growth) as
dependent variables. Hierarchical multiple regression analyses were employed to analyze the main and moderating effects of rumination and centrality of events on the four outcome variables. Rumination subtype scores and centrality of events scores were centered and interaction terms were created using these centered variables. In the first step of the hierarchical regressions, one individual rumination subtype variable score and the centrality of events score were entered. At step two, the two-way interaction term between rumination subtype and centrality of events was entered. Four hierarchical multiple regressions were computed for each outcome variable so that the effects of each subtype of rumination and centrality could be explored transdiagnostically. Statistical results from the regression analyses are displayed in Tables 2-5. When the interactions were significant, post-hoc analyses (t-tests) were utilized to determine whether the slopes of the regression lines at various levels of the moderating variable were significantly negative or positive. That is, simple slopes were examined to illustrate the regression of rumination on outcome for the mean, as well as one standard deviation above and below the mean score of centrality (Aiken & West, 1991).

**Main and moderating effects for depression symptoms.** Increased depression symptoms were predicted by the full model of centrality, brooding rumination, and the interaction term (total variance accounted for = 31%). Centrality and brooding emerged as significant predictors, but the interaction term did not account for a significant proportion of the variance in depression symptoms, thus centrality was not considered to moderate the relationship between brooding and depression symptoms. Increased symptoms of depression were also significantly predicted with a model including centrality, reflecting rumination, and the interaction term (total variance accounted for = 23%). Centrality and reflecting rumination emerged as significant predictors of depression symptoms, but the interaction term did not account for a significant proportion of variance in depression symptoms. Increased depression symptoms were also significantly predicted with a model using centrality, intrusive rumination, and the interaction term (total variance accounted for = 15%). Centrality and intrusive rumination emerged as significant predictors, but the interaction term did not account for a significant portion of variance in depression symptoms. Last, increased symptoms of depression were also predicted with a model using centrality, deliberate rumination, and the interaction term (total variance accounted for = 12%). Centrality and deliberate rumination significantly predicted depression symptoms, but the interaction term did not account for a significant proportion of variance in depression symptoms.

**Main and moderating effects for anxiety symptoms.** Increased anxiety symptoms were predicted with a model using centrality, brooding, and the interaction term. Centrality and brooding rumination emerged as significant predictors of anxiety symptoms, and the interaction term accounted for a significant proportion of the variance such that those with high centrality experienced more of an increase in anxiety symptoms with brooding rumination than did those with low centrality (see Figure 5). The first step of the model accounted for 21% of the variance, and the inclusion of the interaction term accounted for 1% additional variance, \( b = .049, t = 2.32, p = .021 \). Brooding rumination predicted increased anxiety symptoms at high \( b = .232, t = 9.59, p = .001 \), mean \( b = .191, t = 10.06, p < .001 \), and low levels of centrality \( b = .150, t = 5.58, p < .001 \). Increased symptoms of anxiety were also predicted with a model using centrality, reflecting rumination, and the interaction term (total variance accounted for = 17%). Centrality and reflecting rumination were significant predictors of anxiety symptoms, but the interaction term did not emerge as a significant predictor. Increased anxiety symptoms were predicted with a model using centrality, intrusive rumination, and the interaction term (total
variance accounted for = 8%). Centrality and intrusive rumination were significant predictors of anxiety symptoms, but the interaction term did not emerge as a significant predictor. Last, increased anxiety symptoms were predicted with a model using centrality, deliberate rumination, and the interaction term (total variance accounted for = 7%). Centrality and deliberate rumination emerged as significant predictors of increased anxiety symptoms, but the interaction term did not account for a significant proportion of the variance.

**Main and moderating effects for PTSD symptoms.** Increased symptoms of PTSD were predicted with a model using centrality, brooding rumination, and the interaction term. Centrality and brooding rumination emerged as significant predictors of PTSD symptoms. The interaction term was significant, such that brooding was associated with increased symptoms of PTSD overall, but brooding for those with highly central events led to more symptoms of PTSD than for those with events lower in centrality (see Figure 6). The first step of the regression accounted for 38% of the total variance, and the inclusion of the interaction term accounted for 1% additional variance, \( b = .118, t = 2.658, p = .008 \). Brooding rumination predicted PTSD symptoms at high \( (b = .610, t = 12.19, p < .001) \), mean \( (b = .519, t = 13.067, p < .001) \), and low levels of centrality \( (b = .430, t = 7.60, p < .001) \). Increased symptoms of PTSD were also predicted with a model using centrality, reflecting rumination, and the interaction term. A main effect was found for centrality, and for reflecting rumination. The interaction between reflecting rumination and centrality accounted for a significant proportion of variance in PTSD, such that those with higher centrality experienced more increase in PTSD symptoms with reflecting rumination as compared to those with low centrality (see Figure 7). The first step of the regression accounted for 33% of the total variance in PTSD symptoms, and the inclusion of the interaction term accounted for 1% additional variance, \( b = .117, t = 2.310, p = .021 \). Reflecting rumination predicted PTSD symptoms at high \( (b = .556, t = 10.17, p < .001) \), mean \( (b = .458, t = 10.59, p < .001) \), and low levels of centrality \( (b = .356, t = 5.64, p < .001) \). Increased symptoms of PTSD were predicted with a model using centrality, intrusive rumination, and the interaction between intrusion and centrality. Centrality and intrusive rumination emerged as significant predictors, and the interaction term was significant, such that for those with highly central events, intrusive rumination led to more symptoms of PTSD compared to those with events that were less central (See Figure 8). The first step of the regression model accounted for 26% of the total variance in PTSD symptoms, and the inclusion of the interaction term accounted for an additional 1% of the variance, \( b = .087, t = 2.160, p = .031 \). Intrusive rumination predicted PTSD symptoms at high \( (b = .336, t = 6.83, p < .001) \), mean \( (b = .274, t = 7.26, p < .001) \), and low levels of centrality \( (b = .212, t = 4.23, p < .001) \). Last, increased symptoms of PTSD were predicted with a model using centrality, deliberate rumination, and the interaction between deliberate rumination and centrality (total variance accounted for = 21%). Centrality and deliberate rumination were both significant predictors, but the interaction term did not contribute significantly to the variance accounted for in PTSD symptoms.

**Main and moderating effects for posttraumatic growth.** Posttraumatic growth was predicted with a model using centrality, brooding rumination, and the interaction between brooding and centrality. A positive main effect was found for centrality, but no main effect was found for brooding rumination. The interaction between brooding and posttraumatic growth accounted for a significant proportion of the variance in growth, such that brooding was associated with growth only at low levels of centrality (see Figure 9). The first step of the regression model accounted for 20% of the total variance, and the inclusion of the interaction term accounted for 1% additional variance, \( b = -.206, t = -2.905, p = .004 \). Brooding
rumination was not a significant predictor at high ($b = -.069, t = -.86, p = .388$), or mean levels of centrality ($b = .112, t = 1.79, p = .074$), but was associated with increased growth at low levels of centrality ($b = .295, t = 3.307, p = .001$). Posttraumatic growth was also predicted by a model using centrality, reflecting rumination, and the interaction between reflecting and centrality. Centrality was a significant, positive predictor of growth, but reflecting rumination did not emerge as a significant main predictor. The interaction between reflecting and growth accounted for a significant proportion of the variance in growth, such that while reflecting rumination was not a significant predictor of growth at any level of centrality, the relationship was a near-significant trend for those with an event rated low in centrality (see Figure 10). The first step of the regression accounted for 20% of the total variance, and the inclusion of the interaction term accounted for 1% additional variance, ($b = -.186, t = -2.405, p = .017$). Reflecting rumination was not related to posttraumatic growth at high ($b = -.107, t = -1.29, p = .20$), or mean levels of centrality ($b = .040, t = .608, p = .543$), but a trend was found for increased growth at low levels of centrality ($b = .187, t = 1.941, p = .053$). Increased posttraumatic growth was predicted by a model using centrality, intrusive rumination, and the interaction between intrusion and centrality. Centrality was a significant predictor, as was intrusion, and the interaction term accounted for a significant proportion of the variance in growth, such that intrusive rumination was associated increased growth for those with an event rated lower in centrality (see Figure 11). The first step of the regression model accounted for 21% of the total variance, and the inclusion of the interaction term accounted for an additional 1% of variance, ($b = -.142, t = -2.491, p = .013$). Intrusive rumination was not significantly related to posttraumatic growth symptoms at high levels of centrality ($b = .056, t = .804, p = .422$), but was associated with increased growth at mean ($b = .180, t = 3.373, p = .001$), and low levels of centrality ($b = -.305, t = 4.310, p = .001$).

Last, increased posttraumatic growth was predicted by a model using centrality, deliberate rumination, and the interaction between centrality and deliberate rumination. Centrality was a significant predictor, as was deliberate rumination, and the interaction term between deliberate rumination and centrality accounted for a significant proportion of the variance in growth. Deliberate rumination was associated with increased posttraumatic growth overall, but for those with low centrality events deliberate rumination was associated with a more significant increase in growth than for those with a highly central event (see Figure 12). The first step of the regression model accounted for 31% of the total variance, and the inclusion of the interaction term accounted for an additional 1% of variance, ($b = -.114, t = -1.965, p = .050$). Deliberate rumination was significantly related to growth at high ($b = .498, t = 6.46, p < .001$), mean ($b = .608, t = 19.78, p < .001$), and low levels of centrality ($b = .717, t = 9.170, p < .001$).

**Discussion**

This study was an exploration of the circumstances under which one cognitive coping strategy, rumination, might be expected to be adaptive or maladaptive following an experience of stress or trauma. Ruminating in all forms was found to be associated with negative outcomes globally, which is consistent with prior literature, (McLaughlin & Nolen-Hoeksema, 2011; Nolen-Hoeksema & Morrow, 1993, 1994; Watkins & Moulds, 2007; Watkins & Teasdale, 2001). Several forms of ruminatve thought were also found to be associated with posttraumatic growth, at least for some individuals. The context dependent nature of this study’s findings may help to clarify inconsistencies in this body of literature. Rumination has been associated with a memory bias toward negative, self-important information (Harvey, et al., 2004), and so another
aspect of memory, event centrality (Berntsen & Rubin, 2006), was hypothesized to have an impact on the outcomes of use of this strategy. A relationship between centrality and rumination did emerge, though these patterns differed slightly by rumination type and the outcome assessed. Overall, high event centrality was found to exacerbate the negative outcomes assessed and did not aid in, and at some times was inhibitory to, the achievement of posttraumatic growth following use of rumination. When the interactions between specific types of rumination and event centrality were accounted for, only deliberate rumination showed the potential for fostering posttraumatic growth at all levels of event centrality.

**Potential for rumination to serve an adaptive function**

Findings by several research groups have revealed that rumination may have the potential for adaptive function (Aldao & Nolen-Hoeksema, 2011; Nolen-Hoeksema, et al., 2008; Treynor, et al., 2003; Watkins, 2008), but the exact relationship between rumination and positive outcomes has not been fully explored. This study examined three aspects of rumination that were thought to influence the outcomes of its use: 1) the intentional or intrusive nature of the rumination; 2) the focus of the rumination, that is whether it is general or event-focused in nature; and 3) specific aspects of the memory of the event, as represented by the event’s centrality.

**Intentionality vs. intrusiveness.** Based on previous findings with both of the rumination measures used (Calhoun, et al., 2000; Stockton, et al., 2011; Taku, et al., 2011; Treynor, et al., 2003; Whitmer & Gotlib, 2011), it was hypothesized that rumination that is more intentional in nature would be associated with making meaning of an event and problem solving, thus the reflecting and deliberate forms of rumination were expected to be related to more positive outcomes. Findings ran somewhat counter to what would have been expected, but the hypotheses were partially supported. A positive main effect was found for all types of rumination, both the intrusive types (brooding and intrusive) and the purposeful, deliberate types (reflecting and deliberate), on all of the negative outcomes assessed. This consistent finding indicated that for all negative outcomes, there was not a distinction between intentional and intrusive types of rumination. Instead, these findings indicated that all types of rumination had the potential to lead to the development of negative mental health outcomes. Similarly, while deliberate and intrusive rumination positively predicted posttraumatic growth, reflecting rumination did not. Thus, a division could not be made that distinguished intrusive and deliberate forms of rumination as functionally separate for negative outcomes. When the interaction with event centrality was examined, it became clear that while those individuals with low central events found benefit from most strategies, only deliberate rumination positively predicted growth for individuals at all levels of centrality. Thus, intentionality of use alone did not determine the adaptiveness of the strategy. Intentionality in the use of rumination may be important, but it was not sufficient to differentiate between and an adaptive strategy and one that is maladaptive.

**General vs. specific focus.** The ERRI was constructed based on theory that suggested a specific focus on an experienced event would produce somewhat different outcomes than the more traditional, trait-like rumination (Cann, et al, 2011; Calhoun, et al., 2000). It was hypothesized that the event-related rumination subtypes of intrusive and deliberate rumination might be in some ways different with respect to outcomes than trait-like brooding and reflecting rumination. While both trait-like forms of rumination (brooding and reflecting) and both event-related forms (intrusive and deliberate) positively predicted all negative outcomes, it was only for the event-related types that a positive main effect was found for posttraumatic growth. This
suggested that a specific focus on an event might in fact facilitate growth through meaning making and problem solving, as predicted by Calhoun and colleagues (2000). When event centrality was accounted for, brooding, intrusive, and deliberate rumination types were found to be associated with growth at low levels of centrality. However, as deliberate rumination was the only strategy that positively predicted growth at all levels of centrality, this again indicates that there are multiple components to determining the adaptiveness of a given strategy. Just as intentionality was not sufficient for adaptive outcomes, neither was focus of the rumination. It was only when these facets of rumination were considered together with centrality that it became clear the circumstances under which ruminative strategies may be beneficial. While strategies did predict a range of negative mental health outcomes in this cross-sectional analysis, several strategies also showed promise for facilitating posttraumatic growth. While deliberate rumination was associated with growth regardless of centrality level, it was only when centrality was considered that other forms of rumination showed promise for promoting meaning making and problem solving leading to growth.

**The role of event centrality.** Since prior research has revealed a complex picture of event centrality, one where centrality is related to both positive and negative outcomes (Berntsen & Rubin, 2006; Boals & Schuettler, 2011), it is important to understand how an individual might be differently using coping strategies under various levels of event centrality. Rumination in particular correlates with attention to self-relevant and autobiographical stimuli. For those with high event centrality, stimuli related to the event might be expected to capture attention in this way, thus experience of a highly central event was thought to be related to use of rumination strategies as a way to make meaning and process the experience. High centrality was hypothesized to buffer the impact of maladaptive forms of rumination while enhancing the positive outcomes attained from any adaptive forms of rumination. These expected relationships were not found, but centrality was still found to represent an interesting context under which the function of rumination did appear to be impacted.

Event centrality emerged as a global predictor of outcomes, positively predicting all outcomes, positive and negative, as was expected based on prior literature (Berntsen & Rubin, 2006; Boals & Schuettler, 2011). While it was predicted that those with high centrality would fare better with use of ruminative strategies, the opposite was found in this sample. High event centrality exaggerated the negative impact of all four types of rumination, while those who experienced an event they rated as low in centrality appeared to be less negatively impacted by use of rumination. Similarly, use of brooding and intrusive rumination were each associated with an increase in growth only for those with events lower in centrality, as compared to those with highly central events. Reflecting rumination was a non-significant trend only for those with low central events. Only deliberate rumination was associated with growth at all levels of centrality, but even in this case it was the participants who had a low central event who were able to benefit the most from use of this strategy. A sharper increase in growth was associated with low centrality as compared to mean or high levels of centrality. These findings were counter to the expectation that a more integrated or central event would benefit from increased processing due to its relative importance to the individual. Instead, the findings suggest that there may be limited utility in repetitive ruminative thought regarding a highly central event. Once that event has been integrated into the person’s identity, continued use of repetitive thought strategies may be more detrimental than helpful, and even deliberate rumination may not be as helpful to those individuals as to those with lower event centrality. Those individuals with a low centrality event may not have made meaning yet from their experiences, and the events themselves have not been
overly integrated into their identity, which may be the specific context in which excessive repetitive thought can be harmful. Taken together, these data suggest that there are two situations under which potential benefits of rumination strategies may be obtained following a stressful or traumatic event. Benefits may be seen when those who have not yet integrated their stressful or traumatic experience into their self-identity use rumination; that is, their event is rated as low in centrality. These data also suggest that while all rumination types are associated with negative outcomes, and most types are also associated with growth for at least some individuals, rumination that is focused on a specific event and engaged in deliberately has the potential to provide the largest number of people with the experience of growth regardless of the centrality of their event.

**Rumination as a unified or multi-faceted construct**

Given that there were some aspects of rumination found to operate differently than others, it is important to consider whether the term rumination reasonably describes a single, unitary construct or something that is multi-faceted. The measures assessing brooding and reflecting correlated highly and operated similarly with respect to outcomes and centrality, so therefore appeared to be a uniform construct. Brooding and reflecting rumination were more highly correlated with one another than with either intrusive or deliberate rumination, and intrusive and deliberate rumination were most highly correlated with one another. This pattern of correlations suggested the possibility of common method biases, given that the constructs most highly correlated with each other were derived from the same scales, even though they were thought to pertain to different subtypes of rumination. Despite this possible artifactual covariation related to common scale formats, it was notable that, at times, intrusive rumination was found to operate similarly to brooding or reflecting rumination with respect to outcomes and interaction with centrality. This correlational pattern suggested that intrusive rumination operated similarly to, but was also somewhat distinct from trait-like rumination. Intrusive and deliberate rumination correlated highly and operated similarly with respect to negative outcomes. As it has been established, deliberate rumination did show promise in terms of fostering posttraumatic growth for the largest number of individuals in this sample, suggesting that deliberate event-related rumination might be a construct which is unique in its relationship to achieving growth. Similarly, while brooding and intrusive rumination were most highly correlated with symptoms of PTSD, deliberate rumination was associated most highly with posttraumatic growth, further emphasizing that it may have a specific and unique role in fostering growth.

**Transdiagnostic implications.** Rumination has been categorized as a transdiagnostic mechanism (Aldao & Nolen-Hoeksema, 2010, 2011; Harvey, et al., 2004), meaning that it has been associated with maintenance of symptoms of a variety of negative mental health outcomes. It is also important to note that the experience of a stressful or traumatic event is also associated with a variety of outcomes (Hedtke, et al., 2008; Lu, et al., 2008; Taft, et al., 2009), making this experience transdiagnostic in nature as well. Consistent with this framework, the negative outcomes assessed were highly correlated. Additionally, posttraumatic growth was significantly correlated with PTSD symptoms, as was expected (Berntsen & Rubin, 2006; Boals & Schuettler, 2011), and with anxiety symptoms. Posttraumatic growth was not associated with depression symptoms in this sample. In addition to the high correlations between outcomes, centrality positively predicted all outcomes, positive and negative, indicating that this too may be best considered a transdiagnostic process. Further research will be needed to identify the precise nature of its role in differing outcomes. It is notable that all four types of rumination were
positive predictors of all negative outcomes, providing further evidence for ruminations robust relationship with the formation and maintenance of a variety of maladaptive outcomes. The role of centrality in moderating the use of ruminations types was similar across the negative outcomes assessed; though centrality did not moderate relationships with respect to depression symptoms, high centrality was found to exacerbate the negative impact of the use of ruminations with respect to anxiety and PTSD symptoms. The association between low centrality and more positive outcomes was evident, also, with respect to posttraumatic growth.

This pattern of findings indicates that not only is ruminations a transdiagnostic process, but the contribution of centrality of events to the understanding of this process may be transdiagnostic as well. This is important when considering how ruminations can be used or targeted in therapeutic interventions with individuals after an experience of stress or trauma. The robust nature of the construct of ruminations reinforces that targeting this process in therapy could potentially have a substantial impact, one that could affect a wide variety of symptoms and areas of distress and also foster growth. Treatment of an individual after an experience of stress or trauma may be enhanced by identifying whether the person is relying on ruminative processes and considering the role of the centrality of the traumatic event to the person’s identity in determining the adaptiveness or maladaptiveness of that strategy.

**Limitations**

A limitation of this work may be the heterogeneity of experiences described by participants, which were varied in type of event experienced, severity, and recency. Similarly, the sample used in the present study was not a clinical sample which contributes significantly to the variability in outcome measures but may also reduce its clinical application. It will be important to examine these relationships in a clinical sample so that the utility of these findings to intervention strategies might be better understood. It is expected, however, that these robust findings would be more evident in a sample experiencing a high level of symptoms, where the outcomes of use of these strategies would be expected to be more deleterious.

Another clear limitation of this work is its relatively homogenous sample. The participants of this study were close in age, predominantly Caucasian, and largely from a background of higher socio-economic status. Additionally, all measures were self-report which may introduce method bias. Specifically, it is possible that mood and current symptomatology could impact ratings across measures. The cross-sectional design was also a significant limitation. It has been found that some of the potential positive effects of reflecting or deliberate ruminations may most easily be seen over time (Taku, et al., 2011). Additionally, there is no measure of how recent the described events were for the participants, adding to the heterogeneity of the reported events. Future research may be served by examining the ratio of negative symptoms to growth. The way this ratio changes over time may be more important in understanding these complex and related outcomes than simply a static measure of both at one cross-sectional time point. This study is, however, unique in that it examined both centrality and cognitive coping strategies as predictors of simultaneous positive and negative outcomes. This adds to the small but growing literature that looks comparatively at both positive and negative outcomes, and adds an examination of cognitive coping in the context of stressful and traumatic event-related factors.

Additionally, intrusive thought is itself a symptom of PTSD, and so it is complicated to explore repetitive thought strategies such as ruminations as predictors of PTSD symptoms. It will be important to examine separate clusters of PTSD symptoms in order better understand the
contribution of different types of rumination and of centrality. Finally, additional research will be required to further explore the mechanisms associated with posttraumatic growth in order to better understand this complex construct and what posttraumatic growth actually represents for individuals with a trauma history.

**Future research needs and clinical implications**

The findings of the present study have clear implications for future research utilizing these two measures of rumination. First, it is important to consider the distinctiveness of these two measures in designing future studies. It is clear that the two measures are distinct predictors of outcome, particularly when it comes to the positive outcome of posttraumatic growth. Additionally, the RRS may operate as a more unified construct than the ERRI and there is some indication that event-related intrusive rumination may be in some ways related to the trait-like rumination measured by the RRS. Present findings indicate that the reflecting subscale of the RRS may not contribute to an understanding of rumination above and beyond what a composite of brooding and reflecting might yield, and so careful consideration of whether these subscales might be best used separately or together is suggested. For a longitudinal project, however, separation of the subscales may be warranted as prior findings indicate that it is over time that the benefit of the use of reflecting might be evident. The ERRI may assess a more multifaceted construct as compared to the RRS, and may provide a more nuanced examination of both adaptive and maladaptive rumination, particularly for individuals with a highly central event. As this measure specifically assesses rumination in response to an event, present findings make it clear that an understanding of event centrality is essential for interpreting scores on the ERRI.

There are also clear implications of these findings for clinical work. Therapeutic work with survivors of trauma has integrated cognitive and emotional processing of events, and this work is considered to be essential by many (Greenberg, 1995; Horowitz, 1986; McCann, et al., 1988). It is believed that repetitive thought about a traumatic experience can help resolve the discrepancy between the traumatic experience and disruption of core beliefs, help make sense of the trauma, aid in the integration of new understandings into beliefs and assumptions about others and the world, and facilitate working through the intense affect that resulted from the experience (Harber & Pennebaker, 1992; Horowitz, 1986; Janoff-Bulman, 1992). This is consistent with Calhoun and colleagues (2000) conceptualization of event-related rumination, but not consistent with the deleterious effects associated with trait-like measures of rumination.

The present findings make clear the importance of examining the ways in which clinicians encourage clients to engage in repetitive thought. The study’s findings suggest that there are some individuals for whom rumination can be advantageous, and particularly a deliberate, focused repetitive thought strategy (like the deliberate rumination described here) may be helpful in facilitating posttraumatic growth. However, it should be understood that even this type of strategy may simultaneously exacerbate negative symptoms. It is also indicated that there are individuals for whom the strategies of brooding, reflecting, and intrusive rumination may not be helpful and actually impede growth following a stressful or traumatic event. It is possible that for these individuals, rumination actually may serve to engender a victim identity and prevent meaning making or moving on from the experience in a positive way. Careful monitoring of client progress is recommended, so that clients who might benefit from repetitive thought strategies are using them appropriately, and so that maladaptive rumination in general can be addressed in order to better achieve positive outcomes in therapy.
References


Table 1. 
Intercorrelations of Study Variables

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>CES-D</td>
<td>.562**</td>
<td>.654**</td>
<td>.056</td>
<td>.323**</td>
<td>.533**</td>
<td>.438**</td>
<td>.342**</td>
<td>.282**</td>
</tr>
<tr>
<td>2.</td>
<td>ZAS</td>
<td>1.00</td>
<td>.641**</td>
<td>.170**</td>
<td>.240**</td>
<td>.453**</td>
<td>.377**</td>
<td>.244**</td>
<td>.219**</td>
</tr>
<tr>
<td>3.</td>
<td>PCL</td>
<td>-</td>
<td>1.00</td>
<td>.181**</td>
<td>.437**</td>
<td>.563**</td>
<td>.495**</td>
<td>.429**</td>
<td>.360**</td>
</tr>
<tr>
<td>4.</td>
<td>PTGI</td>
<td>-</td>
<td>-</td>
<td>1.00</td>
<td>.449**</td>
<td>.197**</td>
<td>.145**</td>
<td>.302**</td>
<td>.527**</td>
</tr>
<tr>
<td>5.</td>
<td>CES</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1.00</td>
<td>.322**</td>
<td>.308**</td>
<td>.437**</td>
<td>.537**</td>
</tr>
<tr>
<td>6.</td>
<td>RRS-B</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1.00</td>
<td>.656**</td>
<td>.320**</td>
<td>.354**</td>
</tr>
<tr>
<td>7.</td>
<td>RRS-R</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1.00</td>
<td>.274**</td>
<td>.368**</td>
</tr>
<tr>
<td>8.</td>
<td>ERR-I</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1.00</td>
<td>.650**</td>
</tr>
<tr>
<td>9.</td>
<td>ERR-D</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1.00</td>
</tr>
</tbody>
</table>

*p < .05  **p < .01
Table 2. Regression Models for predicting Depression, Anxiety, and PTSD symptoms and Posttraumatic Growth with Brooding Rumination

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Step 1</th>
<th>Step 2</th>
<th>p</th>
<th>q</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression Symptoms</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Centrality</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Brooding</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>CentralityXBrooding</td>
<td>16</td>
<td>17</td>
<td>18</td>
<td>19</td>
</tr>
</tbody>
</table>

| Anxiety Symptoms | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  |
| Centrality      | 0  | 1  | 2  | 3  | 4  | 5  | 6  | 7  |
| Brooding       | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 |
| CentralityXBrooding | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |

| PTSD Symptoms  | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  |
| Centrality     | 0  | 1  | 2  | 3  | 4  | 5  | 6  | 7  |
| Brooding       | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 |
| CentralityXBrooding | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |

Note: *p < .05, **p < .01
<table>
<thead>
<tr>
<th>Step and Predictor</th>
<th>b</th>
<th>∆F</th>
<th>∆R²</th>
<th>b</th>
<th>∆F</th>
<th>∆R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Centrality</td>
<td>1.16</td>
<td>6.18</td>
<td>.110</td>
<td>9.62</td>
<td>.165</td>
<td>8.13</td>
</tr>
<tr>
<td>Brooding</td>
<td>8.09</td>
<td>5.78</td>
<td>**</td>
<td>10.04</td>
<td>7.0 **</td>
<td>7.83</td>
</tr>
<tr>
<td>Centrality X Brooding</td>
<td>.036</td>
<td>1.32</td>
<td>.046</td>
<td>1.93</td>
<td>.186</td>
<td>.241</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Centrality</td>
<td>.324</td>
<td>8.48</td>
<td>.642</td>
<td>11.04</td>
<td>**</td>
<td>11.04</td>
</tr>
<tr>
<td>Brooding</td>
<td>.472</td>
<td>10.95</td>
<td>.017</td>
<td>.259</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Centrality X Brooding</td>
<td>.117</td>
<td>2.31</td>
<td>**</td>
<td>-2.41</td>
<td>*</td>
<td>-2.41</td>
</tr>
</tbody>
</table>

Regression Models for predicting Depression, Anxiety, and PTSD Symptoms and Posttraumatic Growth with Reflecting Rumination

Table 3.
<table>
<thead>
<tr>
<th>Step and Predictor</th>
<th>b</th>
<th>t</th>
<th>∆F</th>
<th>∆R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Centrality</td>
<td>0.11</td>
<td>4.96</td>
<td>6.06</td>
<td>0.07</td>
</tr>
<tr>
<td>Brooding</td>
<td>0.11</td>
<td>5.82</td>
<td>3.67</td>
<td>0.07</td>
</tr>
<tr>
<td>CentralityXBrooding</td>
<td>0.02</td>
<td>1.01</td>
<td>0.41</td>
<td>-2.49</td>
</tr>
<tr>
<td>PTSD Symptoms</td>
<td>100</td>
<td>1.17</td>
<td>1.14</td>
<td>0.00</td>
</tr>
<tr>
<td>Anxiety Symptoms</td>
<td>200</td>
<td>1.02</td>
<td>0.74</td>
<td>-0.57</td>
</tr>
</tbody>
</table>

*p < .05
**p < .01
Table 5: Regression Models for predicting Depression, Anxiety, and PTSD symptoms and Posttraumatic Growth with Deliberate Rumination

<table>
<thead>
<tr>
<th>Step and Predictor</th>
<th>Depression Symptoms</th>
<th>Anxiety Symptoms</th>
<th>PTSD Symptoms</th>
<th>Posttraumatic Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$b$</td>
<td>$t$</td>
<td>$\Delta F$</td>
<td>$\Delta R^2$</td>
</tr>
<tr>
<td>1</td>
<td>3.98**</td>
<td>1.74</td>
<td>20.71**</td>
<td>0.069</td>
</tr>
<tr>
<td>Centrality</td>
<td>0.123</td>
<td>5.11**</td>
<td>0.075</td>
<td>3.54**</td>
</tr>
<tr>
<td>Brooding</td>
<td>0.084</td>
<td>3.35**</td>
<td>0.057</td>
<td>2.56*</td>
</tr>
<tr>
<td>CentralityXBrooding</td>
<td>-0.019</td>
<td>-0.80</td>
<td>-0.002</td>
<td>-0.073</td>
</tr>
<tr>
<td>2</td>
<td>1.38**</td>
<td>1.94</td>
<td>7.76**</td>
<td>0.38</td>
</tr>
<tr>
<td>Centrality</td>
<td>0.358</td>
<td>7.76</td>
<td>0.329</td>
<td>5.10**</td>
</tr>
<tr>
<td>Brooding</td>
<td>0.194</td>
<td>4.00**</td>
<td>0.605</td>
<td>9.78**</td>
</tr>
<tr>
<td>CentralityXBrooding</td>
<td>0.042</td>
<td>2.57*</td>
<td>-1.97*</td>
<td>1.97*</td>
</tr>
</tbody>
</table>

*p < .05, **p < .01
### Figure 1
Hypothesized depressive, anxious, and PTSD Symptoms and brooding or intrusive rumination by centrality level.

<table>
<thead>
<tr>
<th></th>
<th>High Centrality</th>
<th>Low Centrality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Brooding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intrusive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rumination</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Brooding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intrusive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rumination</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Figure 2
Hypothesized posttraumatic growth and brooding or intrusive rumination by centrality level.

<table>
<thead>
<tr>
<th></th>
<th>High Centrality</th>
<th>Low Centrality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Brooding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intrusive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rumination</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Brooding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intrusive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rumination</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Figure 1.* Hypothesized depressive, anxious, and PTSD Symptoms and brooding or intrusive rumination by centrality level.

*Figure 2.* Hypothesized posttraumatic growth and brooding or intrusive rumination by centrality level.
Figure 3. Hypothesized depressive, anxious, and PTSD symptoms and reflecting or deliberate ruminations by centrality level.

Figure 4. Hypothesized posttraumatic growth and reflecting or deliberate ruminations by centrality level.
Figure 5. Anxiety symptoms and brooding rumination by centrality level.

Figure 6. PTSD symptoms and brooding rumination by centrality level.
Reflecting Rumination

Figure 7. PTSD symptoms and reflecting rumination by centrality level.

Intrusive Rumination

Figure 8. PTSD symptoms and intrusive rumination by centrality level.
Figure 9. Growth and brooding rumination by centrality level.

Figure 10. Growth and reflecting rumination by centrality level.
Figure 11. Growth and intrusive rumination by centrality level.

Figure 12. Growth and deliberate rumination by centrality level.
Appendix A

Center for Epidemiologic Studies Depression Scale

Below is a list of the ways you might have felt or behaved. Please tell me how often you have felt this way during the past two weeks.

<table>
<thead>
<tr>
<th>None of the Time</th>
<th>Some of the Time</th>
<th>Occasionally</th>
<th>All of the Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Less than 1 day)</td>
<td>(1-2 days)</td>
<td>(3-4 days)</td>
<td>(5-7 days)</td>
</tr>
</tbody>
</table>

1. I was bothered by things that usually don’t bother me.
2. I did not feel like eating; my appetite was poor.
3. I felt that I could not shake off the blues even with help from my family or friends.
4. I felt that I was just as good as other people.
5. I had trouble keeping my mind of what I was doing.
6. I felt depressed.
7. I felt that everything I did was an effort.
8. I felt hopeful about the future.
9. I thought my life had been a failure.
10. I felt fearful.
11. My sleep was restless.
12. I was happy.
13. I talked less than usual.
15. People were unfriendly.
16. I enjoyed life.
17. I had crying spells.
18. I felt sad.
19. I felt that people dislike me.
20. I could not get “going.”
Zung Self-Rated Anxiety Scale

Below is a list of the ways you might have felt or behaved. Please tell me how often you have felt this way during the past two weeks.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A Little of</td>
<td>Some of</td>
<td>Good Part</td>
<td>Most of</td>
</tr>
<tr>
<td></td>
<td>The Time</td>
<td>the Time</td>
<td>of the Time</td>
<td>the Time</td>
</tr>
</tbody>
</table>

1. I feel more nervous and anxious than usual.
2. I feel afraid for no reason at all.
3. I get upset easily or feel panicky.
4. I feel like I’m falling apart and going to pieces.
5. I feel that everything is all right and nothing bad will happen.
6. My arms and legs shake and tremble.
7. I am bothered by headaches, neck and back pain.
8. I feel weak and get tired easily.
9. I feel calm and can sit still easily.
10. I can feel my heart beating fast.
11. I am bothered by dizzy spells.
12. I have fainting spells or feel like it.
13. I can breathe in and out easily.
14. I get feelings of numbness and tingling in my fingers and toes.
15. I am bothered by stomachaches or indigestion.
16. I have to empty my bladder often.
17. My hands are usually dry and warm.
18. My face gets hot and blushing.
19. I fall asleep easily and get a good night’s rest.
20. I have nightmares.
Centrality of Event Scale

Please think back upon the most stressful or traumatic event in your life and answer the following questions in an honest and sincere way, by circling a number from 1 to 5.

1. This event has become a reference point for the way I understand new experiences.
2. I automatically see connections and similarities between this event and experiences in my present life.
3. I feel that this event and experiences has become part of my identity.
4. This event can be seen as a symbol or mark of important themes in my life.
5. This event is making my life different from the life of most other people.
6. This event has become a reference point for the way I understand myself and the world.
7. I believe that people who haven’t experienced this type of event think differently of me.
8. This event tells a lot about who I am.
9. I often see connections and similarities between this event and my current relationships with other people.
10. I feel that this event has become a central part of my life story.
11. I believe that people who haven’t experience this type of event, have a different way of looking upon themselves than I have.
12. This event has colored the way I think and feel about other experiences.
13. This event has become a reference point for the way I look upon my future.
14. If I were to weave a carpet of my life, this event would be in the middle with threads going out to many other experiences.
15. My life story can be divided into two main chapters: one is before and one is after this event happened.
16. This event permanently changed my life.
17. I often think about the effects this event will have on my future.
18. This event was a turning point in my life.
19. If this event has not happened to me, I would be a difference person today.
20. When I reflect upon my future, I often think back to this event.
PTSD Checklist – Civilian Version (PCL-C)

Below is a list of problems and complaints that people sometimes have in response to stressful life experiences. Please read each one carefully, put an “X” in the box to indicate how much you have been bothered by that problem in the last month.

<table>
<thead>
<tr>
<th>No.</th>
<th>Response</th>
<th>Not at all (1)</th>
<th>A little bit (2)</th>
<th>Moderately (3)</th>
<th>Quite a bit (4)</th>
<th>Extremely (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Repeated, disturbing memories, thoughts, or images of a stressful experience from the past?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Repeated, disturbing dreams of a stressful experience from the past?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Suddenly acting or feeling as if a stressful experience were happening again (as if you were reliving it)?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Feeling very upset when something reminded you of a stressful experience from the past?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Having physical reactions (e.g., heart pounding, trouble breathing, or sweating) when something reminded you of a stressful experience from the past?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Avoid thinking about or talking about a stressful experience from the past or avoid having feelings related to it?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Avoid activities or situations because they remind you of a stressful experience from the past?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Trouble remembering important parts of a stressful experience from the past?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Loss of interest in things that you used to enjoy?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Feeling distant or cut off from other people?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Feeling emotionally numb or being unable to have loving feelings for those close to you?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Feeling as if your future will somehow be cut short?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Trouble falling or staying asleep?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Feeling irritable or having angry outbursts?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>Having difficulty concentrating?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>Being “super alert” or watchful on guard?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>Feeling jumpy or easily startled?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Post-Traumatic Growth Inventory - 42

For each of the statements below, use the scale provided to indicate the degree to which this change occurred in your life as result of the stressful or traumatic situation you identified. That statements are arranged in pairs representing different types of change you might have experienced.

Within each pair,
- You might not have experienced either change,
- You might have experience both changes to some degree, or
- You might only have experienced one type of change.

Consider both statements in each pair, then rate the degree to which you experienced each type of change using the scale below.

0= I did not experience this change as a result of my crisis.
1= I experienced this change to a very small degree as a result of my crisis.
2= I experienced this change to a small degree as a result of my crisis.
3= I experienced this change to a moderate degree as a result of my crisis.
4= I experienced this change to a great degree as a result of my crisis.
5= I experienced this change to a very great degree as a result of my crisis.

Please rate each item below by placing a number from the scale that reflects you choice in the space provided to the left of the item.

____ 1a. I change my priorities about what is important in life.
____ 1b. I find it difficult to clarify priorities about what is important in life.
____ 2a. I have less of an appreciation for the value of my own life.
____ 2b. I have a greater appreciation for the value of my own life.
____ 3a. I developed new interests.
____ 3b. I have fewer interests than before.
____ 4a. I have diminished feeling of self-reliance.
____ 4b. I have a greater feeling of self-reliance.
____ 5a. I have a better understanding of spiritual matters.
____ 5b. I have a poorer understanding of spiritual matters.
____ 6a. I more clearly see that I cannot count on people in times of trouble.
____ 6b. I more clearly see that I can count on people in times of trouble.
____ 7a. I established a new path for my life.
____ 7b. I have a less clear path for my life.
____ 8a. I have a greater sense of distance from others.
____ 8b. I have a greater sense of closeness with others.
____ 9a. I am more willing to express my emotions.
____ 9b. I am less willing to express my emotions.
____ 10a. I am less certain that I can handle difficulties.
____ 10b. I know better than I can handle difficulties.
____ 11a. I am able to do better things with my life.
____ 11b. I am less capable of doing better things with my life.
____ 12a. I am less able to accept the way things work out.
____ 12b. I am better able to accept the way things work out.
____ 13a. I can better appreciate each day.
____ 13b. I appreciate each day less than I did before.
____ 14a. Fewer opportunities are available than would have been before.
____ 14b. New opportunities are available which wouldn’t have been otherwise.
____ 15a. I have less compassion for others.
____ 15b. I have more compassion for others.
____ 16a. I put more effort into my relationships.
____ 16b. I put less effort into my relationships.
____ 17a. I am less likely to try to change things that need changing.
____ 17b. I am more likely to try to change things that need changing.
____ 18a. I have a weaker religious faith.
____ 18b. I have a stronger religious faith.
____ 19a. I discovered that I’m stronger than I thought I was.
____ 19b. I discovered that I’m weaker than I thought I was.
____ 20a. I learned a great deal about how disappointing people are.
____ 20b. I learned a great deal about how wonderful people are.
____ 21a. I better accept needing others.
____ 21b. I find it harder to accept needing others.
The Event Related Rumination Inventory

After an experience like the one you reported as being most stressful or traumatic, people sometimes, but not always, find themselves having thoughts about their experience even though they don’t try to think about it. Indicate for the following items how often, if at all, you had the experiences described during the weeks immediately after the event.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Not At All</th>
<th>Often</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

1. I thought about the event when I did not mean to.
2. Thoughts about the vent came to mind and I could not stop thinking about them.
3. Thoughts about the event distracted me or kept me from being able to concentrate.
4. I could not keep images or thoughts about the event from entering my mind.
5. Thoughts, memories, or images of the event came to mind even when I did not want them.
6. Thoughts about the event caused me to relive my experience.
7. Reminders of the event brought back thoughts about my experience.
8. I found myself automatically thinking about what had happened.
9. Other things kept leading me to think about my experience.
10. I tried not to think about the event, but could not keep the thoughts from my mind.
11. I thought about whether I could find meaning from my experience.
12. I thought about whether changes in my life have come from dealing with my experience.
13. I forced myself to think about my feelings about my experience.
14. I thought about whether I have learned anything as a result of my experience.
15. I thought about whether the experience has changed my beliefs about the world.
16. I thought about the experience might mean for my future.
17. I thought about whether my relationships with others have changed following my experience.
18. I forced myself to deal with my feelings about the event.
19. I deliberately thought about how the event had affected me.  
   I thought about the event and tried to understand what happened.
Ruminative Responses Scale

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

1. almost never       2. sometimes       3. often       4. almost always

How often do you…

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 and 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 about 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
Stressful Life Events

Please take a moment and think of the most upsetting and traumatic experiences or times of your life. They can be experiences about which you feel worried, guilty, ashamed or upset. They can include difficult events (e.g., parents divorced, raped, injured, sick, break-up with romantic partner) or difficult times (e.g., transition to college). They can be things that happened in the past or things that are happening now. Now, think about which of these events or experiences is the most upsetting, stressful, or traumatic for you. Please list the event here:

We are also interested in other stressful or traumatic events you may have experienced. Please read the following list and check YES if you have experienced any of these events.

<table>
<thead>
<tr>
<th>Check YES if each situation has happened to you</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have you ever had your life threatened by a natural disaster?</td>
<td></td>
</tr>
<tr>
<td>Were you ever involved in a motor vehicle accident in which your life was threatened?</td>
<td></td>
</tr>
<tr>
<td>Were you ever involved in another type of accident in which your life was threatened?</td>
<td></td>
</tr>
<tr>
<td>Have you ever been directly involved in warfare or military combat?</td>
<td></td>
</tr>
<tr>
<td>Have you experienced the sudden death of a close friend or loved one?</td>
<td></td>
</tr>
<tr>
<td>Has a loved one ever experienced a life-threatening or permanently disabling event?</td>
<td></td>
</tr>
<tr>
<td>Have you ever had a major or life-threatening illness?</td>
<td></td>
</tr>
<tr>
<td>Were you ever robbed or mugged using physical force or a weapon?</td>
<td></td>
</tr>
<tr>
<td>Have you ever been assaulted by an acquaintance or stranger?</td>
<td></td>
</tr>
<tr>
<td>Have you ever been witness to the severe assault of an acquaintance or stranger?</td>
<td></td>
</tr>
<tr>
<td>Have you ever been threatened with death or serious bodily harm?</td>
<td></td>
</tr>
<tr>
<td>Did you ever experience physical abuse as a child?</td>
<td></td>
</tr>
<tr>
<td>Were you ever a witness to violence in your family?</td>
<td></td>
</tr>
<tr>
<td>Did you ever experience physical or emotional neglect as a child?</td>
<td></td>
</tr>
<tr>
<td>Did you ever experience emotional abuse as a child (belittled, often called names, or otherwise made to feel as though you were worthless)?</td>
<td></td>
</tr>
<tr>
<td>Were you ever victimized by bullying or cyber-bullying by peers?</td>
<td></td>
</tr>
<tr>
<td>Have you ever experienced emotional or physical abuse from an intimate or romantic partner?</td>
<td></td>
</tr>
<tr>
<td>Did you ever experience sexual abuse as a child (attempted sexual assault, penetration, molestation, or other) by someone at least 5 years older than you were?</td>
<td></td>
</tr>
<tr>
<td>Question</td>
<td>Response</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Did you ever experience sexual abuse as an adolescent (attempted</td>
<td></td>
</tr>
<tr>
<td>sexual assault, penetration, molestation, or other)?</td>
<td></td>
</tr>
<tr>
<td>Did you ever experience sexual abuse as an adult (attempted sexual</td>
<td></td>
</tr>
<tr>
<td>assault, penetration, molestation, or other)?</td>
<td></td>
</tr>
<tr>
<td>Have you ever been stalked?</td>
<td></td>
</tr>
<tr>
<td>Have you or your partner ever had a miscarriage or an abortion?</td>
<td></td>
</tr>
<tr>
<td>Did your family ever experience a significant negative change in their</td>
<td></td>
</tr>
<tr>
<td>financial situation resulting in a loss of job or home?</td>
<td></td>
</tr>
</tbody>
</table>

Are there any other stressful or traumatic events you’ve experienced that we haven’t asked about?
If so, please indicate it here: ____________________________________________

________________________________________

42