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The Role of Rumination in the Function, Content, and Affective Quality of Self-Defining Memories

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Self-Defining Memories

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Abstract

Rumination is a response to a negative mood that is characterized by an intense self-focus, specifically on one's negative feelings and the challenges or problems these feelings may pose (Nolen-Hoeksema, 1991). Numerous studies have stressed the maladaptive nature of this response style and several have begun to investigate its role in autobiographical memory recall (Lyubomirsky, Caldwell, & Nolen-Hoeksema, 1998; Lyubomirsky & Nolen-Hoeksema, 1995; Nolen-Hoeksema, Parker, & Larson, 1994). However, rumination research has yet to focus on self-defining memories which have an added relevance and importance to an individual (Singer & Blagov, 2004). The present study investigates rumination's role in the content, functions, and affective quality of self-defining memories. Ninety-five Connecticut College students first filled out measures of rumination and depression. Sixty of these participants were later asked to write out 10 self-defining memories according to Singer and Salovey's (1993) criteria and rate them on affective valence, importance, and function. Memories were coded for specificity, integrative meaning, redemption, and contamination. Rumination was found to be positively correlated with the directive function of memory, with the brooding and depressive aspects of rumination also predicting use of memories to serve certain functions. However, the mean depression score for high ruminators was twice that of low ruminators, possibly indicating that the ways in which ruminators think about their memories may be maladaptive.

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Self-Defining Memories

When reminiscing about the past, we are faced with a jumble of happiness,

sadness, pride, and regret, and it can be considerably difficult to fit these memory pieces

into a collective life puzzle. Some individuals are able to fit these pieces together quite

nicely, ultimately exhibiting the ability to derive meaning and insight from a mix of

experiences. However, others are faced with more difficulty in doing so, often leaving the

pieces unattached or incoherently configured (Blagov & Singer, 2004; Singer, Rexhaj, &

Baddeley, 2007). Alternatively, a third group of individuals may find meaning in their

memories, but in turn fixate on the darker elements and pessimistic interpretations of

their experiences (Treynor, Gonzalez, & Nolen-Hoeksema, 2003). In addition to the

ability to derive meaning from memories, some individuals are able to put their memories

to use by utilizing them to establish goals, strengthen social bonds, and form a cohesive

life story narrative (Bluck & Alea, 2002). Once again, individuals may vary in whether

the guidance and direction they take from their memories ultimately pushes them toward

more hopeful or despairing paths. Even if some individuals do have trouble seeing the

positive meanings and functional value behind seemingly arbitrary events, it does not

necessarily mean that these aspects are absent. This inconsistency leads to the question of

what differentiates individuals who possess the ability to connect to their memories in

these ways from others who cannot. The present study examines the possibility of a

ruminative response style as a mediating factor in the application of meaning and

function to self-defining memories, as well as its role in the thematic content, affect, and

specificity of these memories.

Rumination

Taken at face value, focusing on thoughts and emotions may seem like a

constructive mechanism for solving problems and making sense of situations. Although

this concept has been found to be true for certain types of self-focused cognitive

processing (Bower, Kemeny, Taylor, & Fahey, 1998; Watkins & Teasdale, 2004),

research has not established the constructive value of a type of self-focus called

rumination. Rumination is most commonly conceptualized as a type of depressive

cognition that accompanies and sustains negative mood. According to Response Styles

Theory, rumination is characterized by an intense self-focus, specifically on one's

negative feelings and the challenges or problems these feelings may pose (Nolen-

Hoeksema, 1991). In addition to the depression-related elements of this cognitive style,

rumination is also defined by its reflective and brooding aspects. The reflective aspect of

this response style indicates that individuals will engage in self-focus in order to

problem-solve and lessen the intensity of their negative affect. In addition, the concept of

brooding indicates that ruminators engage in passive reflection and comparison of their

symptoms to personal goals or standards set by society and peers (Treynor, Gonzalez, &

Nolen-Hoeksema, 2003).

As can be inferred by the reflective aspect of rumination, individuals who utilize

this response style believe it can help them attribute meaning to their problems and

negative symptoms, as well as help them to find solutions to solving these dilemmas.

Because of this belief, high ruminators prefer and continuously use this negative self-

focus despite its lack of positive results. Consequentially, high ruminators tend to avoid

ways in which they can repair their negative mood state (Nolen-Hoeksema, 1991). For

instance Lyubomirsky and Nolen-Hoeksema (1993) found that ruminators tend to avoid

the distraction response style in which one engages in positive, distracting activities to

counteract a negative mood. In study 1 of this article, dysphoric and nondysphoric

individuals were assigned to either a rumination-induction or distraction group.

Following the induction, participants were asked to rate a series of possible pleasant

activities on how much they believed they would enjoy them as well as the likelihood

that they would partake in them. Results indicated that when dysphoric individuals were

induced to ruminate, they expressed less interest in participating in distracting activities

than did their non-dysphoric and dysphoric non-ruminator counterparts. Although able to

assess these activities as positive and even potentially enjoyable, the dysphoric

ruminators felt that their self-focus would be more constructive. A second study was

conducted in a similar manner; however, the rumination and distraction inductions were

eliminated. Results of the second study indicated that there were no significant

differences between dysphorics and non-dysphorics in terms of the evaluation of the

activities (both in terms of expected enjoyment and willingness to participate), pointing

to rumination as the cause of the disparity. The results of these studies indicate the

perceived constructive nature of rumination and the tendency to stick with this

mechanism once it is initiated.

The reflective aspect of rumination provides room for debate as to whether this

response style could be considered an adaptive tool. Proponents for the adaptive nature

of rumination indicate, for instance, that it can set an individual on the path to solving a

problem even if the process is not effective in its entirety (Martin & Tesser, 1996).

Further, when the element of hope is present in conjunction with rumination, the

depressive aspects of this self-focus can be weakened. The weakening of this very

negative aspect of rumination leads to the possibility of a more constructive self-focus as

the individual is concentrating less on negative thoughts and symptoms (Geiger & Kwon,

2010). Similarly, Watkins and Teasdale (2004) found that certain types of self-focused

rumination could be considered adaptive. In their study with depressed patients, either

experiential or analytical rumination was induced before autobiographical memory recall.

Results indicated that when rumination was self-focused in terms of thinking about one's

experiences as opposed to a more critical and analytical self-focus, over-general memory

was reduced. Although neither type of rumination had a positive or negative effect on

mood, experiential self-focus was concluded to be adaptive as over-general memory has

been found to negatively affect the course of depressive treatment. Although additionally

arguing for the adaptive nature of rumination, Pysczcynski and Greenberg (1987) agree

that rumination is fundamentally a negative process that creates a negative self-concept.

However, this process could be considered adaptive in that the self-concept it creates can

be used to account for one's negative symptoms and avoid disappointment in the future,

as long as it is accompanied by a more hopeful and action-oriented mindset.

Nonetheless, the majority of studies that define rumination within the boundaries

of Response Styles Theory note that its passive and circular nature render it a

maladaptive tool. For example, rumination has been found to cause a bias in the

evaluation of events. It has also been found to be counterproductive when trying to

problem solve. In a series of three studies Lyubomirsky and Nolen-Hoeksema (1995)

examined these ideas by investigating rumination's role in the evaluation of events (both

hypothetical and possible future events) and in the context of interpersonal problem

solving. In the first study, dysphoric individuals induced to ruminate indicated

significantly higher negative evaluations of hypothetical situations in comparison to

distracted dysphorics, distracted nondysphorics, and nondysphoric ruminators. In study 2,

dysphoric ruminators also evaluated possible future events in a much more negative

fashion than did the other groups. Finally, in study 3 dysphoric individuals induced to

ruminate about their negative symptoms were less able to produce helpful and effective

solutions to hypothetical interpersonal problems than were their nondysphoric and

dysphoric non-ruminator counterparts. In addition to causing difficulties with problem

solving, rumination has been found to impair executive functioning. For example,

Watkins and Brown (2002) found that when induced to ruminate, dysphoric individuals

had increased difficulty performing a random number generation task. The researchers

stress that this impairment centered on the induction of rumination and was not simply

the result of depression. The results of both of these studies point to rumination's

problematic nature in various aspects of human functioning.

Rumination is also maladaptive in the sense that it can prolong and even worsen

negative mood states. For example, this effect has been found with the depressive

symptoms following a traumatic experience. Nolen-Hoeksema, Parker, and Larson

(1994) conducted a longitudinal study of 253 adults who had recently experienced the

loss of a loved one. Individuals who experienced more rumination following the loss

tended to exhibit higher levels of stress and depression than did those who experienced

less rumination. These individuals also tended to be women with less social support than

low ruminators. One month following the loss, high ruminators tended to have a more pessimistic coping style than the low ruminators, which also predicted greater depressive symptoms at a six month follow-up. This discrepancy was evident even when controlling for variables such as initial depression levels, stress, gender, and social support. Similarly, Nolen-Hoeksema and Morrow (1991) examined responses to the 1989 Loma Prieta earthquake. Emotional well-being and response styles to negative mood were measured two weeks prior to the earthquake and levels of depression and post-traumatic stress were in turn measured both ten days and seven weeks following the event. Results indicated that participants with high initial levels of stress, depression, and rumination had higher levels of depression and post-traumatic stress when measured at both follow-up sessions than individuals scoring lower on the initial measures. Additionally, students who indicated high levels of rumination specifically because of the earthquake itself also indicated a lessened psychological well-being at both follow-up sessions. McLaughlin and Nolen-Hoeksema (2011) further investigated rumination's role in the exacerbation of negative symptoms, specifically its role in the development of anxiety. When comparing data from both an adolescent and adult sample, rumination had at least a partial role in the presence of anxiety in depressed individuals. Baseline measures of depression also predicted the onset of anxiety (and vice versa), with rumination as the mediating factor in this relationship. The results of these studies highlight rumination's effect on the maintenance, prolongation, and worsening of negative mood states.

Finally, the maladaptive nature of rumination is indicated by its ability to predict problematic behavior. Nolen-Hoeksema, Stice, Wade, and Bohon (2007) examined this idea by looking at rumination's relationship to depression, bulimia, and substance abuse

in adolescent females. Results of the study indicated that high ruminative tendencies predicted eating problems such as bulimic behaviors and binge eating as well as substance abuse and depressive symptoms. These symptoms and behaviors in turn predicted an increase in ruminative tendencies, evidencing the reinforcing nature of symptom and response. These findings indicate rumination's predictive validity in certain maladaptive behaviors, alluding to its possible role in the initial onset of these symptoms and practices. Similarly, Caselli, Ferretti, Leoni, Rebecchi, Rovetto, et al. (2010) examined rumination's value to predict drinking behavior in alcohol abusers. Eighty outpatients first completed measures of depression, rumination, and alcohol use. These participants attended followed-up sessions at three months, six months, and one year following the completion of these initial measures. Results indicated that rumination was a strong predictor of continued and even augmented alcohol abuse at all three follow-up sessions and this relationship was evident even when controlling for depression. Sarin and Nolen-Hoeksema (2010) also investigated rumination's role in substance abuse. The researchers compared a sample of individuals who had suffered from childhood sexual abuse with a non-abused control group on measures of psychological distress, rumination, and substance abuse. The abused group indicated high levels of all three constructs, with rumination mediating the relationship between their sexual abuse and substance abuse.

Although rumination is thought by some to be an adaptive mechanism, the aforementioned research indicates the numerous problems it can cause. The problem is particularly evident in the persistent, circular, and often passive nature of this mechanism. Even when nothing positive comes from ruminating, the instigator still believes in its

productive value. This conviction leads the individual to avoid repairing negative mood, while sustaining a mindset that evaluates the world in a negatively biased manner.

Self-Defining Memories

As can be seen from the preceding studies, individuals are variable in how they respond to situations and attempt to solve problems. In a similar vein, all individuals develop their own highly unique set of experiences and memories over a lifetime. Memories are essentially the chapters of one's story that ultimately comprise a larger picture called a *narrative identity* (McAdams, 2001; Singer, 2004). Each new chapter added contributes depth and complexity to this narrative, sometimes molding it into something new entirely. Memories of episodes in an individual's life are generally grouped into the category of autobiographical memory. This type of memory can vary in terms of specificity ranging from general periods in an individual's life to a memory of a specific event (Conway & Pleydell Pierce, 2000; Conway, Singer, & Tagini, 2004; Williams, Conway, & Cohen, 2008). However, within this endless collection of remembrances lie certain events that have an added relevance to one's identity. These memories are often categorized as "self-defining" (Singer & Salovey, 1993). In an episode of the television series *Lost*, the character Charlie, a rock musician with a troubled past, is faced with imminent death as he plans to save the lives of his friends in an act of self-sacrifice. As Charlie reflects on his life, he begins to write out memories that he plans to pass on to the women he loves. When his friend asks him what he is doing, Charlie says that these are "my greatest hits…memories, they're all I've got." In an effort to explain who he truly is to the love of his life, he writes out the experiences

that were the most meaningful and relevant to him. Charlie's greatest hits are perfect

examples of self-defining memories.

A self-defining memory is a type of autobiographical memory that is important,

vivid, and emotionally powerful for an individual. The valence of such memories can be

positive, negative, or both as long as the affect they induce is especially powerful. These

memories are thought of often by an individual and are linked to similar memories in

some way, whether it be in terms of theme, content, or affective quality. Memories that

are self-defining also exemplify elements of central concerns or conflicts in an

individual's life. These elements can range from interpersonal conflicts to themes of

achievement and goal orientation (Singer & Salovey, 1993). Singer (2008) notes that

these memories must be consciously recallable to an individual, as well as specific in

terms of a certain event or set of events in an individual's life. In addition to these

characteristics, recollection of these memories involves a sense of reliving the

experience, often resurfacing some of the same emotions of the original event. Similar to

Charlie's "greatest hits," Singer describes these memories as touchstone experiences.

Although each individual has many autobiographical memories, these touchstone

memories are especially important.

Singer and Moffitt (1991-1992) conducted the first study distinguishing self-

defining memories from the general category of autobiographical memory. Their initial

study used a minimal instruction memory prompt ("recall a memory from at least one

year ago") to test the reliability of the single event and summary scoring system. In this

instance, single-event memories far outnumbered summary memories. Study 2 used the

self-defining memory prompt, which added a more meaningful context for memory

recall. The prompt also implicitly requested more generalized memories, which brought

about the hypothesis that participants would produce more summary memories. The

prompt did elicit more summary memories than in study 1, but these memories were once

again far outnumbered by specific memories. Additionally, the self-defining memory

prompt did not elicit memories with more affective intensity, importance, and specificity

than did the minimal instruction prompt, but the memories did tend to be both longer and

more vivid. In study 3, the researchers attempted to create an autobiographical memory

task that was comparable to the self-defining memory prompt in detail and specificity.

The requests were thus very similar, with the autobiographical memory task stating that

"the memory may or may not still be important." As was predicted, the self-defining

memory task elicited many more summary memories than did the autobiographical

memory task, and self-defining memories were rated as more important than were

autobiographical memories. The results of these studies indicate that the memory prompt

does play a significant role in the memories that are reported, particularly their specificity

and importance.

　　　From this series of studies, a reliable method for coding memories for their

specificity also emerged. In these studies, each memory was distinguished as either a

single-event memory narrative or a summary-memory narrative. Single-event memory

narratives are memories that reference a specific time in an individual's life, often

incorporating precise imagery and emotions felt in that particular moment. Summary-

memory narratives are more general recollections of either a longer period or a series of

repeated events that combine to form a generic account of that experience. Both

autobiographical memories as well as self-defining memories were scored for specificity

according to these criteria. Overall, single-event memories were recalled at a much higher

frequency than were summary memories (78 versus 22% across the four studies).

Although specificity did not play a role in the affect of the memories, the significance of

the memories tended to correlate with summary narratives.

Blagov and Singer (2004) examined self-defining memories across four

dimensions: specificity, integrative meaning, content, and affect. Specificity was once

again labeled as either specific or summary for each memory using a coding manual

updated from the previously mentioned study. The construct of integrative meaning was

defined as the ability to interpret and evaluate one's own self-defining memories in

certain ways. Extracting meaning from a memory can mean learning lessons that are

relevant to the self and relationships or more generally gaining insight about life. The

content of the memories refers to coding for certain themes and underlying conflicts

within the narrative. Examples of such can be themes of romance and achievement as

well as sequences of redemption (going from bad to good) and contamination (going

from good to bad) (McAdams, Reynolds, Lewis, Patten, & Bowman, 2001) . Finally, the

element of affect was also examined both in terms of valence and intensity. This study

collected ten memories from each participant and coded each for the aforementioned

constructs. These four dimensions were in turn compared with the dimensions of self-

restraint, distress, and repressive defensiveness as measured by the Weinberger

Adjustment Inventory (Weinberger, 1998). Results of the study indicated that specificity

was negatively correlated with repressive defensiveness, which involves avoiding

negative feelings while simultaneously presenting oneself in a positive light.

Additionally, higher numbers of integrative memories were positively correlated with

higher levels of self-restraint and adjustment. Finally, the distress reported by participants was related to the affect and content of the memories. For example, negative affect, elements of threat, and the presence of disturbed relationships predicted a high degree of distress in participants. The results of this study indicated that certain elements of self-defining memories have significant relationships with various personality traits.

The four dimensions examined by Blagov and Singer (2004) are commonly found throughout the study of self-defining memories. For example, Singer, Rexhaj, and Baddeley (2007) also examined the content, affect, specificity, and integrative meaning of self-defining memories. Instead of comparing these constructs to certain personality factors, memories of an older sample (participants aged 50 and older) were compared on these dimensions to those of a younger sample (college students). Participants in both groups were asked to write out five self-defining memories and rate them on 14 emotions as well as on their vividness and importance based on Blagov and Singer's (2004) memory task and rating sheet. The specificity of the self-defining memories was significantly lower in the older sample than in the sample of college students, indicating a move towards semantic preference in the recollection process of older adults. Even though the memories of older adults were more general, their memories exhibited more integrative meaning as well as positive affect. Although this study was not conducted longitudinally, it suggests a shift in certain elements of memory as humans get older. The researchers connect these changes with an increased ability to step back from memory in older adulthood. Additionally, the shift to a more positive tone is linked to the findings of McCrae, Costa, Lima, Simoes, Ostendorf, et al. (1999) who found a decrease in neuroticism and increase in agreeableness in later adulthood. Although this study

compared two different age groups, the results reflect the variability humans have in their ability to derive meaning from memory.

Integrative meaning was also investigated by Wood and Conway (2006) in their series of studies on the subjective impact and emotionality of self-defining memories. In study 1, participants were asked to come up with a self-defining memory based on an adapted version of Singer and Moffitt's (1991-1992) memory prompt. This memory had to be linked to either primarily positive or negative feelings depending on which prompt the participant received. Participants were then asked to rate a series of phrases aimed at measuring how much impact the memory had on the individual as well as how much meaning the participant had ascribed to it. Results of study 1 indicated a strong positive correlation between the subjective impact and meaning ascertained from the memories. In study 2, participants were asked to come up with five self-defining memories with the same prompt as study 1 but with no affective valence cue. Participants also rated the current emotions they felt when recalling the memory, how they felt when the event happened (recalled emotion), as well as the subjective impact of the memory. Consistent with the hypotheses, participants who recalled negative memories felt increased positive affect and decreased negative affect in terms of their current as compared to recalled emotion. For positive memories, recalled and current positive emotions were found to be equal, whereas negative affect was lessened in the participants' current emotional experience of the memories. The results indicate that even if a memory narrative is negative, it is possible to gain insight from this event and ultimately turn it into something positive. This method of interpretation implies that even individuals with an

overwhelmingly negative past can construct a coherent life story narrative, effectively

connecting the past with the present through the construction of meaning.

      The results of the previous series of studies also highlight instances of redemptive

thinking as the participants were able to transform negative events into positive learning

experiences. Themes of redemption and contamination are commonly studied in

conjunction with autobiographical and self-defining memory. McAdams, Diamond, de

St. Aubin, and Mansfield (1997) were some of the first investigators of these themes. As

was briefly mentioned earlier, they described redemptive sequences as instances when a

narrative turns from negative to positive and contaminative sequences as instances when

the narrative turns from positive to negative. In this initial study, adults high in

generativity (i.e., concern for the next generation) tended to display redemptive

sequences in their life story more often than did adults who scored low on this construct.

Similar to the results of Wood and Conway (2006), these individuals were able to see the

positive in events that started out as negative. McAdams, Reynolds, Lewis, Patten, and

Bowman (2001) found similar results when examining these themes in the memories of

both midlife adults and college students. In the adult sample, high levels of generativity

once again correlated positively with instances of redemption. The number of redemptive

sequences also correlated with self-reports of well-being for both samples and was even

found to predict well-being more accurately than the overall emotional valence of the

memory. Contamination sequences, on the other hand, were found to predict a lessened

well-being in the midlife adult sample. The results of these studies indicate that the way

in which a memory narrative is constructed can play a role in an individual's feelings of

well-being both in terms of present and future experience.

As can be seen by the previous studies, autobiographical and self-defining memories contain elements of important themes and conflicts of an individual's life, and these thematic trends are often a focus of self-defining memory research. Thorne and McLean (2002) examined gender differences in the recollection of life-threatening events depicted in college students' self-defining memories. Three self-defining memories were elicited from each participant using Singer and Moffitt's (1991) criteria for self-defining memories. Participants who reported a life-threatening event for at least one of their self-defining memories were asked to participate in a second study. For the second study, memories were coded for physical toughness imagery, elements of vulnerability, compassion, and awe or fascination in regard to the event. Results of the study indicated several gender differences in the memory accounts. Men tended to incorporate themes of toughness in their memories whereas the memories of women exhibited more prominent themes of compassion. Despite these differences, however, themes of vulnerability were relatively similar for men and women. McLean and Thorne (2003) also examined themes of self-defining memories related to relationships with a similar methodology as with their previous study. Participants once again recorded three self-defining memories but were instead chosen for the second study if they reported at least one memory dealing with relationships. Memories were coded for themes of separation, closeness, and conflict and were also coded for two types of meaning-making: learning lessons and gaining insight. Memories about relationships with parents tended to exhibit themes of separation, whereas memories of peer relationships frequently contained themes of closeness. Themes of conflict were found most often in memories of parent-relationships but these memories also exhibited higher instances of meaning-making than memories of

peer relationships. Consistent with Blagov and Singer (2004) and Singer, Rexhaj, and

Baddeley (2007), these studies demonstrate reliable methods of coding self-defining

memories for their thematic content and meaning-making. These results also imply the

variability of thematic content across different sexes and memory subject matter.

Memories Serving Functions

        In conjunction with studying the content and quality of self-defining memories

and their relationship to certain personality traits, research has focused on certain

functions these memories (and more generally autobiographical memory) may serve.

Baddeley (1987) and Bruce (1989) were some of the first researchers to question the

significance of memory and why humans recall certain memories and not others.

Building on this inquiry, Pillemer (1992) discussed the idea that autobiographical

memory could serve communicative, psychodynamic, and directive functions. The

communicative function refers to the act of telling the memory to another individual to

convey meaning within that narrative. The psychodynamic function involves recalling

memories to gain emotional and psychological insight about the self. Finally, the

directive function of memory involves using memory to help make decisions as well as to

encourage or motivate oneself.

        Contemporary research continues to stress the importance of taking a functional

approach to autobiographical memory. Bluck and Alea (2002, 2010) note that when these

memories are recalled often, there is a high probability that they are thought of for a

reason. Bluck and Alea (2002) outline three possible functions of autobiographical

memory that have emerged from memory functionality research over the years which are

the *self, social*, and *directive* functions. The self-function indicates that an individual uses

autobiographical memory to maintain a coherent self-view, meaning memory is used to link the current self to the person one was in the past. However, this function can also be used to see how one has changed in order to update one's self concept. The directive function uses memory as an aid in problem solving. From autobiographical memory an individual learns about successes and failures in past events. This knowledge prepares individuals for how to respond to current and future events that bear resemblance to past experiences. This function is also used to establish goals and to determine if one is on the right path toward these strivings. Finally, the social function concerns the application of autobiographical memory in social interaction and relationships. At a fundamental level, these memories serve as topics of conversation and ways in which to get to know others and convey oneself to others. Past experiences can also be used to provide aid and empathy to another person who is experiencing difficulties. In this sense, memories can be a way of getting closer to someone and fortifying social bonds.

Singer and Salovey (1996) elaborate on the directive function of memory, noting that self-defining memories in particular are significant factors in the analysis of goal formation and achievement. In one study, Singer (1990) explored this relationship between goals and self-defining memories. Participants rated 15 life-goal sentences on their desirability and were then asked to retrieve a memory for each sentence. Although each goal sentence was to be utilized as a cue in the retrieval process, the memory did not have to correlate directly with the sentence. Participants were then asked to rate the correspondence of the memory retrieved to each sentence. Results indicated that the initial reported affective response to each memory was significantly correlated with the attainment of the corresponding goal cue. The desirability of the goal cue also correlated

significantly with the relevance of the memory to the attainment of the goal. In a second

study, participants were asked to retrieve their memories prior to goal assessment.

Participants were instead cued with broad categories namely family, friends, school, and

activities. Once again, the relevance of each memory to each goal was assessed.

Consistent with the results of the first study, the affect of the memories correlated with

the attainment of each particular goal.

   Moffitt and Singer (1994) similarly investigated memories and goals, instead

utilizing self-defining memories and personal strivings. In their study, undergraduate

participants wrote out a series of self-defining memories and rated their affective

responses to each one. A week after this task, participants were asked to come up with

personal strivings. Personal strivings are a type of goal first described by Emmons

(1986). They can be contrasted with everyday goals and deeper life goals in that they

describe what an individual is "typically trying to do." These goals can reflect ways in

which an individual tries to achieve something as well as a method of avoidance.

Participants rated their personal strivings on ten constructs, including their current

valence, predicted valence in the instance of achievement or failure, and their importance

to the individual. Finally, participants rated the relevance of their memories to their

personal strivings. As with Singer's (1990) study, attainment of the goals was

significantly correlated with the affective assessment of the memories. In other words, the

more the memories were relevant to the attainment of one's personal strivings, the more

they were assessed as positive. Further, elements of avoidance in personal strivings

correlated positively with the non-attainment of these strivings and negative valence of

the memories. Both this study and Singer's (1990) studies provide evidence regarding the

directive function memories can serve. Singer and Salovey (1996) postulate that the

retrieval of memories that are relevant to one's goals can serve as a motivating factor.

Not only do these past experiences provide examples of success, but they may in turn

place an added importance on relevant goals.

These two studies also provide evidence for the self function of memory as

individuals are connecting their past with their current self and goals. Correlating with

McAdams's (1989a, 2001) life story narrative theory, the studies also indicate the human

tendency to find a sense of unity and accord, both with the past and present self.

Memories that were relevant to current goals were assessed as more positive than

memories irrelevant to one's goals for both studies, indicating a positive reaction to the

unity of past and present. The researchers discussed their findings in the light of directive

and self functions noting that "…memory affects individuals not only because it reminds

them of what was, but because it is relevant to what they still seek to attain" (p. 20).

Memory helps us to see the similarities and differences of the current self to the past

person, ultimately motivating us in a particular direction for the future.

Kuwabara and Pillemer (2010) conducted a study investigating this motivating

aspect of the directive function in the autobiographical memories of college students.

Participants were split up into three groups in which they were asked to either recall a

positive memory about their university, a negative memory about their university, or not

recall any memories. Individuals who recalled the positive memory were found to

express the most interest in donating money to their school, attending a reunion in the

future, and recommending the school to a prospective student. Additionally, both

memory groups were more likely to target their donation to the university (as opposed to

a charity) than did the control group. These findings imply that autobiographical memory can have an impact on decision making, particularly when the memory is recalled in close proximity to that decision.

McLean and Thorne's (2003) findings also contribute to the argument for the functional value of memories, particularly in terms of the self function. Similar to the findings of the previous studies, this study also contributed to McAdams's (1989a, 2001) life story narrative theory. In collecting memories on relationships and coding these memories for conflict, separation, and closeness, researchers were able to see elements of meaning-making emerge, especially in terms of memories containing conflict. The researchers conclude that this meaning-making could be due to a push toward self-evaluation and analysis following conflict, whether or not resolution was the end result. In this sense, the researchers connect meaning-making with the self function as this process is connecting the past with the present. The findings of Singer and Moffitt (1991-1992) and Wood and Conway (2006) also correlate with these results because when this connection was made, even the current affective response to negative memories was increasingly positive. Although an event may appear meaningless when it happens, the present self can still ascertain insight from the memory, ultimately contributing to the coherence of a life-story narrative.

The self function of memory was also evidenced by Josephson, Singer, and Salovey (1996) in a study exploring the use of memory to repair negative mood. In the first session of the study, 106 undergraduate participants completed the Beck Depression Inventory, measuring the degree of certain depressive symptoms. In the second session, participants watched one of two videos inducing either a sad or neutral mood. After the

mood induction, participants were asked to recall two memories, rate the valence of these

memories, and describe why they chose to make them either positive or negative.

Participants in the sad mood induction state recalled significantly more negative

memories, consistent with mood-congruent memory recall. However, participants with a

lower depression score tended to recall more positive second memories than did

participants indicating higher levels of depression. Additionally, the majority of these

participants explicitly described the reason for the positive second memory as a way to

repair their negative-mood state. This result correlates directly with Lyubomirsky and

Nolen-Hoeksema's (1993) findings that high ruminators were unwilling to distract

themselves from their negative mood. In this sense it could be postulated that high

ruminators may be unwilling to use their memories to repair their mood.

In a comprehensive review of previous research, McLean, Pasupathi, and Pals

(2007) also concluded that memory can serve this self function. First, they note that

previous studies have found different ways in which parents teach their children how to

construct memory. In turn they hypothesize that these differing methods could have

profound implications for the development of an individual's self-concept. For instance,

female children are often taught to reminisce with an added emotional intensity and

vividness. This pattern of socialization could not only explain the added complexity in

the narratives of women, but also how women in turn tend to construct their self views as

emotional and complex. The authors also discuss how generally, individuals favor

instances that concur with their own self-view. McLean and Pasupathi (2011) later

confirmed this notion in a study looking at memory telling in the romantic relationships

of college students. They found that self-event connections, or meaning attributed to an

event, did tend to be positive and coherent with the self-view of the teller. Additionally,

self-event connections that were remembered at a one-month follow up tended to be ones

that were shared by both partners. Although individuals tend to favor instances of

coherence, McLean, Pasupathi, and Pals (2007) note that this preference doesn't mean

disconfirming events aren't constructed into a narrative story. These disruptive or

unresolved events not only create an interesting story, but their repetition can help an

individual understand the events and integrate them into their self-concept. This concept

fits directly into Bluck and Alea's (2002) description of the self function of memory. Not

only is memory used to maintain a coherent self-view, but it is also used to see how one

has changed from the past and integrate those changes into one's self-concept. The

repetition of unresolved events also speaks to the social function of memory. As McLean,

Pasupathi, and Pals outline, co-reminiscence between a parent and child can help a child

gain insight and meaning from these events, even when they are negative. When an

individual tells stories of disruptive instances to others, he or she can gain additional

insight through someone else's view and opinion. Nelson and Fivush (2004) note that

telling memories to others is also a way in which individuals construct a shared past with

the listeners. Even though memories are very personal and individual, including others in

the process of reminiscing can help form important social bonds and even a sense of

culture.

Hayden, Singer, and Chrisler (2006) provide similar evidence for the social

function of memory in a study on the telling of birth stories between mothers and

daughters. Female college students were measured on self-esteem and attachment and

then prompted to recall their birth story. The narratives were coded for their valence as

well as their descriptiveness. Participants were also asked to recall the number of times

they had heard the narratives from their mothers. In the second study, the mothers of the

participants were contacted and also asked to report the narrative of their daughter's birth.

Results of the study indicated that daughters who had reported hearing their birth stories

more frequently in turn reported higher levels of self-esteem and attachment to their

mothers. The positive valence and descriptiveness of the mother's accounts were also in

accordance with high self-esteem and bonding between mother and daughter. The results

of this study provide evidence for the usefulness of memory in the context of social

relationships. In the case of birth narratives, the memories served as a source of bonding

between mother and child. This use of memory ties in directly with several of Bluck and

Alea's (2002, 2010) constructs of the social function of memory such as developing

intimacy and closeness in a relationship.

On the other hand, bereavement narratives have also been studied in conjunction

with the social function of memory. Baddeley and Singer (2008) found that an

individual's personality style can mediate the ability to use bereavement memories in

social situations. For instance, individuals high in neuroticism tended to recall

contamination narratives that focused on the self and the individual's sadness rather than

getting support from others. On the other hand, the memories of conscientious individuals

tended to be less self-centered. Participants high in extraversion exhibited fewer

contaminative themes and were more likely to disclose their memories to gain social

support than those lower in extraversion. When outsiders responded to these narratives,

they indicated sympathy for the narrators of contaminative themes but were much more

accepting and at ease with narrators telling redemptive sequences. These findings indicate

that an individual's personality can influence not only how memories are told, but in turn

how they are received. These findings also have implications for the present study as

individuals who tend to ruminate may exhibit a pattern similar to the neurotic individuals

in the aforementioned study. In that case, these individuals would recall more

contaminative themes that pushed them away from using memory to serve a positive

social function. In a review of past research, Baddeley and Singer (2009) elaborate on the

use of bereavement memories to serve self, social, and directive functions. They note that

in the patient-therapist relationship these memories can best serve Buck and Alea's

(2002) self and directive functions. However, the social function of these memories best

comes into play with family, friends, and peers in the social network of the deceased. The

ability of these memories to serve certain functions is mitigated by a variety of factors

including the way in which they are told, the characteristics of the narrator and listener

(as was evidenced by their 2008 study), the relationship between individuals involved in

the disclosure, and the circumstances of the loss.

As can be seen by several of the previously mentioned studies, putting memories

to use in a constructive manner does not come easily to all people. Singer (2008) notes

that these results have strong implications for the therapeutic context. Because some

individuals simply do not know how to put their memories to use, learning how to do so

can be a growth-effective focus in therapy. The value of this skill is evident not only in

terms of using memory to repair mood but also for other self, social, and directive

functions of memory. Therapists can help individuals find meaning in memories, which

in turn helps them see the continuity in their life story narrative as well as their goals for

the future. Therapists can also help individuals see ways in which their memories can

strengthen social bonds in their life. This approach to memory is commonly seen in the

context of couples, group, and family therapy. Memories, particularly ones that are self-

defining, are commonly used as a source of self explanation, empathy, and example in

relationships, often fostering personal growth and strengthening social bonds.

Rumination and Memory

As rumination commonly involves a problematic reflection on past events, several

studies have investigated its effect on memory. As this response style is primarily

maladaptive, a significant amount of this research has focused on its negative impact on

the recollection of autobiographical memory. For instance, in a series of four studies

Lyubomirsky, Caldwell, and Nolen-Hoeksema (1998) examined rumination's role in the

valence of retrieved autobiographical memory. In the first two studies, dysphoric and

non-dysphoric participants were assigned to either a distraction or rumination-induction

condition. Autobiographical memory was then elicited in both a free recall (study 1) and

memory prompt (study 2) situation. Results of both studies found that depressed

individuals induced to ruminate tended to recall more negative memories than did

dysphorics who were distracted from a ruminative response style or did nondysphoric

individuals. In study 3, dysphoric ruminators also reported negative life events as

occurring more frequently than did their distracted and control counterparts. Finally, in

study 4 researchers measured the valence of spontaneous memory generation during the

rumination-induction task. Once again, the memories reported by the dysphoric

ruminators were the most negative. Similar results were found in a more recent study

done by Wisco and Nolen-Hoeksema (2009). Dysphorics in the rumination-induction

condition reported more negative autobiographical memories but this effect was not seen

in non-depressed individuals. These findings are in accordance with the mood-congruent

theory of memory recall, which indicates that the affective valence of retrieved memories

tends to be in accordance with one's current mood (Blaney, 1986; Singer & Salovey,

1988). Because rumination is a symptom of a negative mood state and can even increase

the intensity of negative feelings, memories recalled by individuals using this response

style tend to be negatively biased.

      The concept of over-general memory is also commonly associated with dysphoric

memory recall, suggesting rumination as a possible cause. For instance, Raes, Hermans,

Williams, Beyers, Brunfaut, et al. (2006) investigated the specificity of autobiographical

memory as a predictor of the course of depression, including rumination as a possible

cause of depressive symptoms. Participants were asked to generate a series of

autobiographical memories in response to cue words and were also measured on levels of

depression and ruminative thinking. Results of the study found that the reduced

specificity of memories resulted in the worsening of depressive symptoms in the seven-

month period between the first and second assessments. However, when rumination was

separated from the measures of depression, specificity did not predict the worsening of

depression. These findings indicate that rumination may be a mediator of over-general

memory affecting the exacerbation of depressive symptoms. A subsequent study

performed by Debeer, Hermans, and Raes (2009) pulled apart the reflective and brooding

aspects of rumination to investigate their influence on memory specificity. The brooding

subcategory of rumination was most closely associated with reduced specificity in

autobiographical memory recall. This finding provides further evidence for the idea that

the brooding aspect of rumination is consistently maladaptive as opposed to its reflective

counterpart. Similarly, Watkins and Teasdale (2001) separated analytic thinking from a more general self-focus to see if there were differences in their effect on the specificity of autobiographical memory. Reducing analytic rumination in turn increased specificity of autobiographical memory, and the authors conclude that over-general memory may be a result of analytic ruminative tendencies in the analysis of past events and current problems. This result could also indicate that individuals using analytic rumination may be drawing stereotypic connections among their memories and finding a recurring negative theme.

The ability to derive meaning from past events has also been studied in conjunction with rumination, commonly in the context of bereavement. Davis and Nolen-Hoeksema (2001) note that a common way of coping with the death of a loved one is to search for meaning in the loss. Meaning-making in this context can be achieved in several ways such as attributing the death to predicable factors (behavior or other elements of the deceased individual's life), fitting the death into one's life perspective, or providing meaning in terms of certain religious or spiritual beliefs. In their study of 205 bereaved participants, the researchers found that the ability to attribute meaning in these ways resulted in reports of character and perspective building, improved relational functioning, and increased adjustment following the loss. However, this progress was only the case if meaning was found in the first few months of the loss. More generally, the authors point out the effects of the inability to gain perspective, noting the despair many people experience when life events seem hollow and meaningless.

Nolen-Hoeksema, McBride, and Larson (1999) point to rumination as a mediator in the context of this despair in a study examining rumination and the search for meaning

in bereaved men. Men who exhibited higher ruminative responses to the loss of a loved

one in an interview indicated high levels of distress both one month and a year following

the loss. Additionally, men who engaged in ruminative self-analysis and searched for

meaning showed greater levels of depression a year following the loss than men who did

not engage in ruminative thinking and search for meaning. In a similar study, Michael

and Snyder (2005) examined ruminative tendencies and meaning making in bereaved

college students. Results of this study indicated that higher ruminative tendencies in

association with the loss acted mediated the relationship between meaning making and

psychological well-being. As has been noted in previous studies, rumination also directly

predicted a lessened psychological well-being in relation to the loss. When participants

had recently lost a loved one, successful meaning-making in regard to the loss was

associated with higher levels of adjustment than when efforts at meaning-making were

unsuccessful. However, as with the study done by Davis and Nolen-Hoeksema (2001),

these results were not found with individuals who had been dealing with the loss for a

longer period of time. The results of these studies indicate that rumination is often used in

attempt to find meaning but is consistently unsuccessful and even harmful in the retrieval

and meaning-making of memories, especially when this ruminative process persists over

an extended period of time.

The Current Study

As can be seen, previous research has only begun to expose rumination's role in

memory. Additionally, the majority of this research focuses on the more general category

of autobiographical memory. Self-defining memories have yet to be closely examined in

the context of rumination. These memories provide an interesting correlate to this

response style because, as Singer and Blagov (2004) note, they are repetitively recalled and particularly important to an individual. In addition to this, ruminative response styles are commonly studied in clinically depressed populations. Although rumination and depression often go hand in hand, the ruminative response style is indeed its own entity with powerful effects separate from depression. The current study worked to build on the research linking rumination and memory, focusing on self-defining memories in a sample of non-depressed individuals.

Based on this review of the rumination and self-defining memory literatures, several possibilities regarding the relationship of rumination and self-defining memories emerged. For the present study, it was predicted that individuals who are higher in rumination, particularly in the brooding and depressive dimensions of this response style, would be more likely to recall more negative self-defining memories and perhaps to put more functional emphasis on their memories for self-understanding, direction, and social communication. In addition, it was predicted that high ruminators would display more contamination themes in their self-defining memories and to incorporate these themes into their self-understanding. Finally, following the earlier findings of Debeer et al. (2009), individuals who displayed more brooding rumination were expected to show a tendency toward more general rather than specific self-defining memories.

In order to answer these questions, the general tendency to ruminate was gauged using the Ruminative Responses Scale (Treynor, Gonzalez & Nolen-Hoeksema, 2003), which in turn can be broken up into depression, brooding, and reflection subscales. In part 2, participants were given a self-defining memory request form (Singer & Salovey, 1993) and asked to write out ten memories that applied to the criteria. Participants rated

their memories on how positively and negatively they felt about them, how long ago they took place, and their importance. For each memory participants were also asked three questions aimed at whether they use the memory for self, social, and directive purposes. Finally, participants were asked three questions about which memories they brood on, reflect on, or feel depressed about specifically.

Method

Participants

Participants were recruited for the pre-assessment portion of the study from the introductory psychology classes at Connecticut College. Signup sheets for the study were posted on the second floor of Bill Hall asking for student names and email addresses, since the *Qualtrics* link would be sent via email. Altogether 95 participants completed part 1 of the study with 61 of them continuing on to complete the full protocol. Nine of the initial 95 were not invited to participate in the second portion of the study as they had a score of 24 or above on the BDI-II. Additionally, the data of one participant who completed both portions of the study were excluded due to the fact that she was not in the targeted age range. Of the final 60 participants, 54 (90%) were women and 6 (10%) were men. Fifty-two participants (86.7%) reported a race or ethnicity of Caucasian, 5 (8.3%) of Hispanic, 2 (3.3%) of Asian, and 1 (1.7%) of mixed race. Nineteen (31.7%) of the participants were Freshmen, 33 (55%) were Sophomores, 3 (5%) were Juniors, and 5 (8.3%) were Seniors. The mean age of the participants was 19.05 (*SD* = .964) with ages ranging from 18 to 22. Forty of the participants that completed the entire protocol went on to participate in an associated study by Pavel Blagov, PhD and Katie Oost of Whitman College.

Materials

     Ruminative Responses Scale. The Ruminative Responses Scale (Treynor, Gonzalez, & Nolen-Hoeksema, 2003; see Appendix A), a subscale of the Response Styles Questionnaire (Nolen-Hoeksema & Morrow, 1991), is a 22-item self-report measure of rumination. This measure had participants rate a series of statements from one to four indicating whether they never, sometimes, often, or always think or do each item when they feel sad, blue, or depressed. These items indicate ruminative responses as they are focused on the self, symptoms, or the origin and consequences of a depressed mood. Additionally, each item of the measure targets either the brooding, reflection, or depression-related aspect of rumination. For example, participants rated statements such as "Think about how alone you feel" (depression-related), "Go away by yourself and think about why you feel this way" (reflection), or "Think 'Why can't I handle things better'" (brooding) based on what they generally do when they are in a depressed mood. Possible scores on this measure range from 0 to 66. The Cronbach's alpha for this measure was .92 for the present study.

     Beck Depression Inventory-II. The BDI-II (Beck, Steer, & Brown, 1996; see Appendix B) is a 21-item self-report measure of depression. Participants were instructed to "read each group of statements carefully, and then pick out the one statement in each group that best describes the way you have been feeling during the past two weeks, including today." For example, on the construct of Self-Dislike, participants indicated from zero to three either: "I feel the same about myself as ever," "I have lost confidence in myself," "I am disappointed in myself," or "I dislike myself." Participants were instructed that if more than one statement applied, they should choose the highest

numbered statement that applied to them. Scores on this measure range from 0 to 63 with

total scores of 0-13 considered minimal, 14-19 mild, 20-28 moderate, and 29-63 severe.

A high internal consistency has been found for both clinical and non-clinical populations,

such as .91 for psychiatric outpatients (Beck, Steer, Ball, & Ranieri, 1996). The

Cronbach's alpha for was .81 for the present study.

Demographics Questionnaire. The demographics questionnaire (see Appendix

C) developed by Blagov, Singer, and Oost (in preparation) for the associated Whitman

College study was also used for this study. This questionnaire has a total of 20 items

asking for a range of information such as age, sex, and ethnicity as well as standardized

test scores and family-related information.

Self-Defining Memory and Memory Function Instructions. At the information

session, participants were given a sheet with instructions and criteria for self-defining

memories (Singer & Salovey, 1993) as well as instructions on how memories may serve

certain functions (see Appendix D). Instructions for self-defining memories indicated that

the memory "must be at least one year old; remembered clearly and still important; about

an important enduring theme, issue, or conflict from your life; linked to other similar

memories that share the same theme or concern; is positive, negative, or both, in how it

makes you feel; and you have thought of the memory many times." Information

informing participants about certain functions their memories may serve was developed

from Bluck and Alea's (2002, 2010) three functions for memories, namely self, social,

and directive functions. Participants were given brief examples of how memories may

serve these functions and asked to think about their memories in relation to them: "You

may use memories to maintain a sense of self over time or to see how much you have

changed from who you used to be" (self function), "You may use memories in

relationships in order to get to know someone and help them get to know you" (social

function), and "You may use memories to help you solve problems or remember a lesson

you learned in the past" (directive function). Participants were instructed to think of ten

self-defining memories based on the given criteria and write them out in the second

online survey.

        TALE Memory Ratings. In part 2 of the study, participants were asked to rate

and answer questions about their memories (see Appendix E). After writing each

memory, participants rated on a scale from zero to four how positive, negative, and

important each memory is to them. Participants were also asked approximately how

many years ago the memory took place. Also for each memory, participants answered

three questions taken from the Thinking About Life Experiences Scale (TALE) (Bluck &

Alea, 2010). The TALE is a 30-item measure used to assess the self, social, and directive

functions of memory. For this study, the instructions were altered slightly so that

participants answered the items about specific memories. The original directions ask

participants to "Please circle one response on each scale to indicate how often, when you

think back about or talk about your life, you do it for the reasons given." This statement

was changed to "Please circle one response on each scale to indicate how often, when

you think back about this memory or talk about it, you do it for the reasons given." The

items with the highest factor loadings were taken from each function's group of

questions. Participants rated the following items on a five point scale from "almost

never" to "very frequently": "When I want to understand how I have changed from who I

was before" (self-function), "When I want to develop a closer relationship with someone"

(social function), and "When I want to learn from my past mistakes" (directive function).

      Rumination on Memories Ratings. After rating each memory with the above

questions, participants answered three questions directed at which memories they

ruminate on specifically (see Appendix F). Participants were presented with the following

instructions:

> Please read these three items and think about whether you do each one when you
>
> think or talk about each of your memories. After reading each statement, write in
>
> the box below which memories the statement applies to. For example, if the
>
> second and third memories you wrote out apply to the first statement, you would
>
> write 2 and 3 in the box below it. Please think about what you generally do, not
>
> what you think you should do.

The three statements used were taken from the Ruminative Responses Scale, but the

wording was changed so that the statements applied to specific memories and were not

focused on the symptoms of a sad or depressed mood. One statement was taken from

each type of rumination question (brooding, reflective, and depression-related). For

example, the refection item "Analyze recent events and try to understand why you are

depressed" was changed to "Analyze this event and try to understand your feelings about

it."

Procedure

      Participants signed up for the study via signup sheets posted on the second floor

of Bill Hall. The signup sheet indicated that participation in the first part of the study

would yield 30 minutes of class credit and that a possible 75 additional minutes of

additional credit would be available for participation in part 2. Individuals who signed up

were sent a *Qualtrics* link to the pre-assessment questionnaires which included a consent

form (see Appendix F) followed by the demographics questionnaire, the Ruminative

Responses Scale, the Beck Depression Inventory-II, The Weinberger Adjustment

Inventory- Short Form, and The Negative Reaction to Acculturation Scale. The last two

surveys on this list were administered for an associated Whitman College study. After

completing these surveys, participants were asked if they wanted to be considered for

participation in part 2 of the study involving a 15-minute information session and an

additional one-hour online survey in which they would write out ten memories and

answer questions about them. If so, they were asked to check yes on the survey and email

the researcher indicating which information session they wanted to attend (the session

times were listed in the initial email). If participants indicated that they did not want to

participate any further, they were emailed a debriefing form designed for part 1 of the

study (see Appendix G) for proof of their 30 minutes of participation. Participants who

elected to be considered for part 2 of the study did not receive the part 1 debriefing form

but did receive a confirmation page with information about counseling services.

Participants with a score of 24 or above or answer of "2" or "3" on number nine of the

BDI-II (which asked about suicidal thoughts) were not considered for the second portion

of the study. Participants with a 24 or above were re-sent information about counseling

services as well as a debriefing form for the first part of the study. Their names and score

were also sent to the supervising professor, Jefferson Singer, PhD, who is a clinical

psychologist. If a participant indicated a "2" or "3" on item number nine, Professor

Singer was notified immediately for a follow up with that participant.

Of the 95 initial participants that completed part 1, 61 continued onto phase two of the study. Nine of the initial 95 participants were excluded from participating in part 2 because they had a BDI-II score of 24 or above. The information sessions lasted approximately 15 minutes and involved giving participants instructions (explained orally as well as on a sheet of paper) for self-defining memories and descriptions of certain functions their memories may serve. Participants were also informed of the associated Whitman College study that they could elect to participate in for either 75 minutes of additional credit or 15 dollars. Finally, participants were given the opportunity to ask questions about the directions and informed that they could email the researcher with any questions they had while completing the second part of the study. For the memory portion of the study, participants were once again sent a *Qualtrics* link via email. Participants were first given the self-defining memory instructions as a reminder and asked to type out their ten memories into the survey. After typing a memory, they were asked to rate it on positivity, negativity, and importance as well as indicate approximately how old the memory was. Participants also answered the three questions taken from the TALE for each memory. Finally, after writing out and rating all ten memories participants were presented with the three rumination questions developed from the RRS and asked to indicate which memories applied to each question. These questions were answered by typing the number of the memories (i.e. the first memory typed out would be memory number one) that applied to each item in a box underneath the statement.

At the end of the study, participants were asked if they wanted to be considered for participation in an associated study sponsored by Whitman College. They were informed that the online study would involve filling out additional surveys and would

compensate participants with $15 or 75 minutes of credit. Participants were informed that

if they would like to participate, some of the data from their pre-assessment surveys and

their memories would also be used for this additional study. Email addresses and data of

participants indicating that they wanted to participate were emailed to Katie Oost of

Whitman College. On completion of the memory portion, participants were emailed a

debriefing form designed for participants who had completed the entire study (see

Appendix H) for proof of their 105 minutes of participation.

Memories were coded for specificity, integrative meaning, and themes of

redemption and contamination. The principal researcher coded all 610 memories and an

additional coder coded the first four memories for each participant (a total of 244

memories). Cohen's Kappa measuring inter-rater reliability was .767 for memory

specificity, .792 for integration, .732 for redemption, and .775 for contamination.

Results

Correlations for Ruminative Responses Scale Scores and Memory Coding/Rating Data

To investigate the relationships between rumination (both the total score on the

Ruminative Responses Scale (RRS) and the scores for the reflection, brooding, and

depression subscales) and the data retrieved from memory coding and participants' own

memory ratings, Pearson correlations were performed (see Table 1). The memory data

and the total rumination scores were correlated in the predicted direction in several cases,

though the majority of relationships did not achieve significance. For instance, the total

RRS score showed a stronger relationship to contamination than to redemption, and the

higher the participants' total rumination score, the more negatively and less positively

they felt about their memories overall. However, neither of these trends reached

significance. As was predicted, the higher the participants' rumination scores, the more they reported using their memories for self, social, and directive functions. A significant positive correlation was even found between total rumination scores and the directive function of memory. There were also several significant findings when the RRS was separated into the reflection, brooding, and depression subscales. Individuals with a higher tendency to brood reported more use of both the self and directive functions of memory than those with lower brooding scores. Additionally, individuals with high scores on depressive rumination indicated more use of the directive function of memory than those with lower scores on this subscale. Aside from the memory ratings and coding, levels of rumination were also found to be highly correlated with levels of depression, r (60) = .534, p < .001.

Table 1

Pearson Correlation Values for RRS Scores and Memory Coding/Rating Data (N = 60)

	RRS Total	RRS Reflection	RRS Brooding	RRS Depression
	r	*r*	*r*	*r*
Specific	.059	-.043	.183	.030
Summary	-.059	.043	-.183	-.030
Redemption	.098	-.066	.218	.101
Contamination	.173	.057	.155	.195
Integration	-.170	-.139	-.104	-.175
Self	.188	.028	**.309***	.159
Social	.183	.086	.140	.207
Directive	**.290***	.160	**.306***	**.268***
Positive	-.210	-.193	-.128	-.197
Negative	.166	.141	.130	.149
Importance	-.023	-.019	.011	-.032

* Correlation is significant at the .05 level (2-tailed)
**Correlation is significant at the .01 level (2-tailed)

Additional analyses were also performed after identifying participants with very low or very high rumination scores. Twenty-one participants were placed in the low-rumination group (with RRS scores ranging from 3 to 17) and 23 were placed in the high-rumination group (with RRS scores ranging from 27 to 60). Independent *t*-tests were

performed to investigate mean differences in the memory ratings. Comparisons made between the means for high and low ruminators once again corresponded to several of the main hypotheses (i.e., the memories of high ruminators were more negative and exhibited more instances of contamination) but these differences did not achieve significance. The means for use of the directive function were significantly different, with the high-rumination group indicating greater use of their memories to serve this function $t(42) =$ -2.30, $p = .026$. The high-rumination group had higher means for both the self and social functions of memory than did the low-rumination group, but their difference indicated a trend and did not achieve significance ($p = .058$ for the social function and $p = .085$ for the self function). High ruminators also tended ruminate on more of their memories than did low ruminators. Although mean differences were not significant for the number of memories they brooded on or felt depressed about, they were for the number of memories they reported reflecting on (analyzing the event and trying to understand their feelings about it), $t(36.55) = -2.62$, $p = .01$. Finally, the mean depression score for high ruminators was more than double the mean score for low ruminators, $t(35.31) = -4.64$, $p < .001$. Means and standard deviations for these findings can be found in Table 2 along with other means examined for high and low ruminators.

Table 2

Means and Standard Deviations for High vs. Low Rumination Groups (N = 60)

	Low Rumination Group (*n* = 21)		High Rumination Group (*n* = 23)	
	M	*SD*	*M*	*SD*
Directive	**2.26***	0.66	**2.73***	0.67
Self	3.02	0.54	3.32	0.57
Social	2.35	0.74	2.72	0.43
Specific	5.95	2.52	5.96	2.80
Summary	4.05	2.52	4.04	2.80
Integration	2.29	2.74	1.70	1.94
Contamination	1.05	1.20	1.22	1.65
Redemption	0.67	1.02	0.91	1.16
Negative	2.46	0.47	2.72	0.57
Positive	3.15	0.66	2.85	0.75
Importance	3.85	0.56	3.77	0.61
BDI Score	**5.19****	3.53	**12.22****	6.25
Reflection Q	**3.24****	1.92	**5.30****	3.20
Brooding Q	2.71	1.62	2.91	2.30
Depression Q	1.43	1.12	2.30	2.30

* Mean differences are significant at the .05 level (2-tailed)
**Mean differences are significant at the .01 level (2-tailed)

Correlations for Rumination on Memories Questions

Although several of main hypotheses were not supported with respect to the tendency to ruminate in general (total RRS score), there were many significant findings with the three questions aimed at ruminating on the memories specifically (see Table 3). Each question was derived from a subscale of the RRS, namely the reflection subscale ("Analyze this event and try to understand your feelings about it"), the brooding subscale ("Think about this memory and wish it had worked out a different way"), and the depression subscale ("Think about this memory and connect it to all of your shortcomings, failings, faults, and mistakes"). Generally speaking, the more individuals tended to ruminate on their individual memories, the more they in turn used their memories to serve self, social, and directive functions (though not all relationships were significant). However, this trend did not apply to all instances, as the more participants reported using memories to serve the self function, the fewer memories they reported reflecting on. Additionally, the more participants reported using the social function of memory, the fewer memories they reported brooding on. However, several significant positive correlations were found. The higher the participants rated using the directive function of memory, the more memories they reported brooding about or feeling depressed about. Additionally, the more memories participants reported feeling depressed about (connecting the memory to all of their shortcomings, failings, faults, and mistakes), the more invested they were in using the social function of memory.

The three "ruminating on memories" questions had stronger relationships to contamination than to redemption, which parallels the trends seen with the RRS scores. In fact, several significant correlations were found in regard to contamination as participants with higher instances of contamination across their ten memories indicated

that they brooded on and felt depressed about a larger number of their reported memories than did participants with fewer instances of contamination. A significant correlation was also found between the reflection subscale of the RRS and the reflecting on memories question (which was derived from one of the questions in that subscale). In other words, the more participants tended to reflect in general, the more of their memories they reported reflecting on (analyzing the event and trying to understand their feelings about it). Finally, numerous significant correlations were found between the three "ruminating on memories" questions and participants' ratings of how positive, negative, and important the memories were to them. The less important participants tended to rate their memories overall, the more of their memories they reported reflecting on. However, there were slight positive correlations (though not significant) between memory importance across the ten memories and the number of memories participants brooded on or felt depressed about. Additionally, the more memories participants reported brooding on and feeling depressed about, the significantly more negative and less positive their memories were in general. These relationships were seen with the reflecting on memories question as well, although the findings did not achieve significance. The pattern of these findings as a whole shows a linkage between a ruminative approach to one's self-defining memories and an inclination to focus more on the negative content and feelings associated with those memories.

Table 3

Pearson Correlation Values for Rumination on Memories Questions (N = 59)

	Rumination Question 1 Reflection r	Rumination Question 2 Brooding r	Rumination Question 3 Depression r
Contamination	.034	**.324***	**.280***
Redemption	.024	-.134	-.189
Directive	.100	**.344****	**.427****
Social	.005	-.154	**.257***
Self	-.093	.093	.247
RRS Brooding	.118	.031	.252
RRS Reflection	**.333****	.101	.127
RRS Depression	.120	.015	.198
Importance	**-.262***	.061	.073
Positive	-.255	**-.510****	**-.458****
Negative	.198	**.610****	**.462****

 * Correlation is significant at the .05 level (2-tailed)
**Correlation is significant at the .01 level (2-tailed)

Correlations for Memory Functions and Memory Coding/Ratings

        There were several significant correlations with the self, social, and directive

functions of memory and other ratings of the memories. The more participants reported

use of the directive function of memory ("When I want to learn from my past mistakes"),

the more instances of contamination they had across their ten memories. The memories of

individuals who tended to use the directive function of memory were also significantly

more negative and less positive than the memories of individuals who did not utilize their

memories to serve this function to such a high degree. Additionally, the more participants

tended to use their memories to serve the self and social functions of memory, the higher

they rated their memories in importance. Finally, reported use of the self function

correlated positively with instances of integrative meaning across the ten memories.

Table 4

Pearson Correlation Values for Memory Functions and Memory Coding/Rating Data

(N = 60)

	Self Function r	Social Function r	Directive Function r
Redemption	.205	.000	.004
Contamination	-.111	.129	**.273***
Specific	-.178	-.130	-.116
Summary	.178	.130	.116
Integration	**.280***	.005	.125
Negative	.032	.176	**.505****
Positive	.142	-.138	**-.347****
Importance	**.544****	**.330****	.212

 * Correlation is significant at the .05 level (2-tailed)
**Correlation is significant at the .01 level (2-tailed)

Extracting Negative Memories

As the relationship between rumination and memory negativity ratings did not achieve significance, additional analyses were performed by extracting the negative memories of each participant. A memory was considered negative if the discrepancy between the positivity and negativity ratings was 3 or more and the negativity rating was higher. For instance, if a memory received a negativity rating of 4 and a positivity rating of 1, it would be considered a negative memory. The relationships between the total number of negative memories and rumination (including the separated subscales) were then investigated using Pearson correlations. Once again, these values did not achieve significance. However, total negative memory scores were positively correlated with the directive function of memory, $r(60) = .360$, $p = .005$, as well as the number of memories participants brooded on, $r(59) = .496$, $p < .001$, or felt depressed about, $r(59) = .320$, $p = 014$.

Discussion

This study was conducted in order to build on the previous research linking rumination and memory. Much of this research has focused primarily on autobiographical memory recall, with the strongest findings in dysphoric samples. The present study sought to examine rumination's role in self-defining memory recall with individuals who were not clinically depressed. It was thought that self-defining memories would provide an interesting correlate to this response style because, as Singer and Blagov (2004) note, such memories are repetitively recalled and particularly important to an individual. Finally, although some research has been done linking rumination to memory specificity, affect, and meaning, there has been little discussion of if and how high ruminators use their memories to serve certain functions. To investigate these questions in a non-

dysphoric sample, participants were pre-screened with measures of rumination and

depression and individuals with significantly high depression scores were not asked to

continue with the study. Participants rated their own 10 self-defining memories and all of

the memories were then coded for integration, specificity, and themes of redemption and

contamination.

The hypothesis that high ruminators would exhibit more summary than specific

memories, particularly with respect to the brooding aspect of rumination, was not

supported by significant findings. Research linking memory specificity to rumination has

tended to focus on dysphoric populations, as over-general memory is thought to have a

cause and effect relationship with depression. This relationship is seen, for instance, in

Raes et al. (2006) as rumination was found to play a mediating role in the degree to

which over-general memory predicted the worsening of depressive symptoms. The fact

that highly depressed individuals were excluded from the present study may help to

explain why no significant findings arose in these analyses. The total number of summary

memories had a slight positive correlation with depression scores, which may indicate

that a higher variability in those scores could have yielded significant results.

The hypothesis that high ruminators would be more inclined to use memory to

serve certain functions was partially supported. High ruminators reported more frequent

use of the directive function of memory than did low ruminators, and this relationship

was strongest for the brooding and depressive aspects of this response style. These

findings can be explained by returning to the thought processes of high ruminators.

Nolen-Hoeksema (1991) notes that high ruminators tend to be particularly aware of the

causes and consequences of their feelings. Because of this awareness, high ruminators

engage in an intense self-focus to make sure that those consequences are avoided. This

heightened awareness of possible consequences of their actions helps explain why high

ruminators would want to use their memories to learn from their past mistakes. In

frequently examining memories where something has gone wrong, these individuals may

believe that they will be more likely to avoid these mistakes in the future. However,

previous research suggests that this intense self-focus can cause significant problems for

individuals (Caselli et al., 2010; Lyubomirsky & Nolen-Hoeksema, 1995; Nolen-

Hoeksema, Parker, & Larson, 1994). The problematic nature of rumination alludes to the

idea that instead of looking at the memory solely as a lesson, these individuals may be

ruminating on whatever mistake they made and how that event unfolded. This approach

to one's memories might be better explained by the fact that individuals higher in the

depressed and brooding aspects of rumination tended to use the directive function of

memory most often. One of the brooding questions on the RRS explicitly asks if the

individual generally "thinks about a recent situation, wishing it had gone better," whereas

one of the depression questions asks if the individual generally "thinks about all [their]

shortcomings, failings, faults, and mistakes." These two questions point to the idea that

high ruminators may be focusing specifically on the negative content of their memories,

ultimately failing to move on after they have learned from that past mistake.

        When high ruminators are using their memories, it is like they are using an actual

tool. These individuals are pounding a hammer over and over yet instead of building a

house, they are knocking down walls. High ruminators, for instance, more often reported

analyzing their memories to try to understand their feelings about them than low

ruminators. This unremitting analysis of the past may lead to an increased functional

emphasis on memory, but may also keep an individual from moving on from that event.

This can be explained further by a significant correlation found between the brooding

aspect of rumination and the use of one's memories to serve the self function ("when I

want to understand how I have changed from who I was before"). These individuals may

not be drawing a simple conclusion about how they have changed or stayed the same but

may instead be incessantly asking themselves "Why do I always react this way?" When

high ruminators, specifically individuals with a tendency to brood, enlist their memories

to serve this self function, they may end up dwelling on the change (or lack thereof) they

see in themselves. This manner of reflecting on the past is evident in the following

memory of a high ruminator:

> When I was little I used to stay up past my bed time to read "Gorillas in the Mist".
> I would hide under my covers with a flashlight and was so scared I would get
> caught that I wouldn't come out even when I was really hot. I would take notes
> and dream of living in the woods with gorillas. I wish I was still like that.

This memory clearly indicates the individual's reflection on the past to see how he or she

has changed. However, there is also a sense of longing for what was as opposed to using

the memory to construct a coherent life-story. It is easy to imagine how one would get

caught up in a memory when reflecting on it in this way.

As Lyubomirsky and Nolen-Hoeksema (1993) note, high ruminators believe that

their self-focus is serving them well. However, previous research points to the fact that

rumination is not constructive (Caselli et al., 2010; Lyubomirsky & Nolen-Hoeksema,

1995; Nolen-Hoeksema, Parker, & Larson, 1994). In the present study, the mean

depression score of high ruminators was more than double that of low ruminators, which

could possibly provide additional support for this explanation. Even though rumination is

not necessarily the cause of depression, it has been found to exacerbate and prolong its

symptoms (McLaughlin & Nolen-Hoeksema, 2011; Nolen-Hoeksema & Morrow, 1991;

Nolen-Hoeksema, Parker, & Larson, 1994). The depression scores of high ruminators

might indicate that the ways in they are thinking about their memories are reinforcing and

perpetuating their depressive feelings.

    Although the rumination and depression scores were highly correlated, the

memories of high ruminators were not significantly more negative nor did they exhibit

more instances of contamination than did low ruminators. However, the means for the

high rumination group were higher for both negativity and contamination than were those

for low ruminators, and correlations approached significance in the positive direction.

The fact that significance was not reached with respect to negativity and contamination

can once again be at least partially explained by the exclusion of highly depressed

individuals. Although Lyubomirsky, Caldwell, and Nolen-Hoeksema (1998) found a link

between rumination and the negativity of memory recall, the effect was seen most

strongly in dysphoric individuals. In the case of Wisco and Nolen-Hoeksema (2009), this

effect was seen only in the depressed sample. Additionally, their study induced

individuals to ruminate as opposed to simply gauging rumination through an inventory.

These findings could indicate that a general tendency to engage in an intense self-focus

when in a negative mood may not correspond to the valence of the memories one would

retrieve in any given moment. The fact that these individuals were not highly depressed

means that it was possible many of them didn't feel particularly depressed when writing

out their memories. Corresponding to mood-congruent memory recall (Blaney, 1986;

Singer & Salovey, 1988), their memories may not have been particularly negative

because of their affective state at the time of recall. For instance, the "Gorillas in the

Mist" memory above illustrates a positive memory of a high ruminator. Even though the

event is not negative per say, the way in which the individual reflects on it has a

decidedly different tone.

The three questions aimed at how individuals ruminate on individual memories

yielded the results that were expected for rumination in general. The more memories

individuals tended to reflect on (analyze the event and try to understand their feelings

about it), brood on (think about the memory and wish it had worked out a different way),

and feel depressed about (think about the memory and connect it to all of their

shortcomings, failings, faults, and mistakes), the more negatively and less positively they

felt about their memories in general. These questions isolate rumination to a more

specific instance which ultimately highlights the negativity of the memories one may be

brooding on or feeling depressed about in particular. In a way, this methodology parallels

that of Lyubomirsky, Caldwell, and Nolen-Hoeksema's (1998) rumination-induction

experiment. Instead of gaining a more general sense of ruminative tendencies, ruminating

was isolated to the moment of memory recall. There was, however, an instance of

isolated rumination on the memories matching up with the general measure of

rumination. The more participants tended to reflect on their thoughts and feelings in

general (as measured by the reflection subscale of the RRS), the more of their memories

they reported reflecting on (analyzing the event and trying to understand their feelings

about it). The reflective aspect of rumination has been deemed the least passive,

maladaptive, and negative of all three facets of rumination (Debeer, Hermans, & Raes,

2009; Watkins & Teasdale, 2001, 2004). These findings may help to explain why the

reflection question was the only one not significantly correlated with the negativity

ratings and instances of contamination in the memories.

The more memories individuals reported feeling depressed about (thinking about

the memory and connecting it to all of their shortcomings, failings, faults, and mistakes),

the more they reported using their memories for the social and directive functions.

Additionally, the more memories individuals reported brooding on (thinking about the

memory and wishing it had worked out a different way), the more they reported using

their memories for the directive function. These findings connect to the previous

discussion on how successful people actually are in using their memories to serve these

functions in an adaptive manner. Although an individual may attempt to use his or her

memories to solve problems, set goals, get to know someone, or see how he or she has

changed, there is still a looming tendency to get caught up in what was or what happened.

This way of thinking connects directly to certain aspects of depressive cognition in that

even if the positive of a situation is made clear to an individual, there is still a tendency to

focus on the negative. This idea is also supported by the fact that the brooding and

depression rumination questions were positively correlated with both memory negativity

and contaminative themes. These results indicate that a ruminative approach to memory

may indeed lead to a focus on the negative content and feelings associated with these

memories. Even if individuals can use their memories in a functional manner, it does not

necessarily mean that they can move on from the negative aspects of their past.

Setting rumination aside, reported use of memories to serve the self and social

functions of memory were significantly correlated with the overall importance ratings of

the memories. In terms of the self function, it is easy to see why importance ratings are so

high. Memories used for this function are acting as a base for who that individual once

was and who he or she has become. However, as McLean, Pasupathi, and Pals (2007)

note, the way in which an event is remembered (including its relevance and emotional

intensity) is heavily influenced by how one is taught to construct narratives. This teaching

is done primarily by one's caregivers and could reflect why there are such differences

between how women and men describe past events. In terms of the social function of

memory, it also makes sense that one would use important memories when trying to

connect to and get to know others. McLean, Pasupathi, and Pals also note that using

memories for this social function can in turn increase their importance as listeners might

help one ascertain meaning and insight from the event.

Limitations

There were several limitations of the present study. As was discussed, not

including individuals with high levels of depression may have contributed to the lack of

significant results with regard to memory specificity, integration, themes, and memory

affect. With the additional nine individuals who had a BDI-II score of 24 or above, these

results may have reached significance. However, these individuals were excluded to

focus on a sample different from previous rumination research that heavily depended on

dysphoric individuals as well as to avoid inducing any emotional distress by the

experimental procedures.

Another limitation of the study was the number of men who ended up completing

the entire protocol. Of the 60 final participants, an overwhelming number of them were

women. This discrepancy was due in large part to the proportion of women to men in the

psychology department at Connecticut College. Due to this limitation, gender differences could not be obtained from the sample. There was also a relatively low number of participants for this study overall. The small sample size was due both to the size of the participant pool as well as to time constraints. Because each participant was asked to write out ten memories, the goal number of participants was kept to 60 so that the memories could be coded in a timely manner.

Additional limitations were due to the ways in which the data were collected. Pre-assessment surveys were sent online to participants to complete on their own time, which may have contributed to how much thought was put into their answers. To diminish this effect for part 2, participants met with the researcher before completing the second portion so that emphasis could be placed on the importance of spending time on the memories. However, participants also completed the memory portion on their own time outside of the lab. Because of this, the amount of time they spent writing out their memories could not be closely monitored.

The placement of the rumination on memories questions may have also caused problems for some of the participants. The three questions were placed at the end of the memory survey and one participant reported not remembering the numbers of his memories. Although there was a "back" button on the survey so that participants could revisit their memories, this sequence may not have been clear or easy to do. Additionally, although these questions were taken from the RRS, they were restated to measure ruminating on specific memories. Previous research has not done this with respect to these questions, which calls into question the validity of these measures.

Finally, the coding of the self-defining memories contributed to the limitations of the study. Although inter-rater reliability was sufficient for all constructs, the two coders were relatively new at coding memories which could have contributed to a degree of inaccuracy with respect to memory specificity, integration, redemption, and contamination.

Additional Research

Despite these limitations, there were several significant findings with regard to rumination and the use of self-defining memories to serve certain functions. Additional research examining rumination and self-defining memories might want to include dysphoric individuals in order to increase the likelihood of gaining significant results with regard to memory affect, themes of redemption and contamination, memory specificity, and integration. Additionally, it is possible that negative memories and themes of contamination were not higher due to the mood-congruency theory of memory recall. Future research could induce a negative-mood state in high ruminators that are not necessarily depressed to see if their memories will then be more negative than those of low-ruminators with the same mood-induction.

As was discussed, the ways in which high ruminators might be thinking about their memories could have a role in how depressed they are feeling, as well as other aspects of their well-being. Future research could elaborate on this concept to see if focusing on the negative aspects of memories does indeed predict a lessened well-being. This possible finding would provide further evidence for the maladaptive nature of rumination.

Conclusion

Previous research linking rumination to memory has tended to focus on the more general category of autobiographical memory. Additionally, the strongest findings (and sometimes the only findings) have been elicited from dysphoric samples. The present study builds on this research with several significant findings in a non-depressed sample, using memories that have an added relevance and importance to these individuals. High ruminators tended to report use of their memories to serve the directive function. However, the fact that their depression scores were more than twice those of low ruminators may point to the idea that the ways in which they are thinking about their memories are maladaptive. High brooders reported frequent use of the self and directive functions, and individuals high in depressive rumination also reported more use of the directive function. These findings with the depressive and brooding facets of rumination speak further to the idea that these individuals may be getting caught up in the negative aspects of their memories. Instead of simply learning a lesson, they may be dwelling on their mistakes or who they were in the past. These findings have profound implications, specifically for the therapeutic context. High ruminators and high brooders appear to be on the right track with trying to put their memories to use, yet there is a tremendous disconnect between their thought process and well-being. A therapist could teach such ruminators how to "use the hammer" in a sense, helping them to build a stronger foundation for their current self and future person.

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Appendix A

RRS

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

		Almost Never	Sometimes	Often	Almost Always
1	Think about how alone you feel	①	②	③	④
2	Think "I won't be able to do my job if I don't snap out of this"	①	②	③	④
3	Think about your feelings of fatigue and achiness	①	②	③	④
4	Think about how hard it is to concentrate	①	②	③	④
5	Think about how passive and unmotivated you feel	①	②	③	④
6	Analyze recent events to try to understand why you are depressed	①	②	③	④
7	Think about how you don't seem to feel anything anymore	①	②	③	④
8	Think "Why can't I get going?"	①	②	③	④
9	Think "Why do I always react this way?"	①	②	③	④
10	Go away by yourself and think about why you feel this way	①	②	③	④
11	Write down what you are thinking and analyze it	①	②	③	④
12	Think about a recent situation, wishing it had gone better	①	②	③	④
13	Think "I won't be able to concentrate if I keep feeling this way"	①	②	③	④
14	Think about how sad you feel	①	②	③	④
15	Think about all your shortcomings, failings, faults, mistakes	①	②	③	④
16	Think about how you don't feel up to doing anything	①	②	③	④
17	Analyze your personality to try to understand why you are depressed	①	②	③	④
18	Go someplace alone to think about your feelings	①	②	③	④
19	Think about how angry you are with yourself	①	②	③	④
20	Think "Why do I have these problems that other people don't have?"	①	②	③	④
21	Think "Why can't I handle things better?"	①	②	③	④
22	Think "What am I doing to deserve this?"	①	②	③	④

Appendix B

BDI-II

Instructions: This questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick out the **one statement** in each group that best describes the way you have been feeling during **the past two weeks, including today**. Circle the number beside the statement that you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for any group, including item 16 (Changes in Sleeping Pattern) or Item 18 (Changes in Appetite).

1. Sadness
- 0   I do not feel sad.
- 1   I feel sad much of the time.
- 2   I am sad all the time.
- 3   I am so sad or unhappy that I can't stand it.

2. Pessimism
- 0   I am not discouraged about my future.
- 1   I feel more discouraged about my future than I used to be.
- 2   I do not expect things to work out for me.
- 3   I feel my future is hopeless and will only get worse.

3. Past Failure
- 0   I do not feel like a failure.
- 1   I have failed more than I should have.
- 2   As I look back, I see a lot of failures.
- 3   I feel I am a total failure as a person.

4. Loss of Pleasure
- 0   I get as much pleasure as I ever did from the things I enjoy.
- 1   I don't enjoy things as much as I used to.
- 2   I get very little pleasure from the things I used to enjoy.
- 3   I can't get any pleasure from the things I used to enjoy.

5. Guilty Feelings
- 0   I don't feel particularly guilty.
- 1   I feel guilty over many things I have done or should have done.
- 2   I feel quite guilty most of the time.
- 3   I feel guilty all of the time.

6. Punishment Feelings
- 0   I don't feel I am being punished.
- 1   I feel I may be punished.
- 2   I expect to be punished.
- 3   I feel I am being punished.

7. Self-dislike
- 0   I feel the same about myself as ever.
- 1   I have lost confidence in myself.
- 2   I am disappointed in myself.
- 3   I dislike myself.

8. Self-Criticalness
- 0   I don't criticize or blame myself more than usual.
- 1   I am more critical of myself than I used to be.
- 2   I criticize myself for all of my faults
- 3   I blame myself for everything bad that happens.

9. Suicidal Thoughts or Wishes
- 0   I don't have thoughts of killing myself
- 1   I have thoughts of killing myself but I would not carry them out.
- 2   I would like to kill myself.
- 3   I would kill myself if I had the chance

10. Crying
- 0   I don't cry anymore than I used to.
- 1   I cry more than I used to.
- 2   I cry over every little thing.
- 3   I feel like crying, but I can't.

11. Agitation
- 0   I am no more restless or wound up than usual.
- 1   I feel more restless or wound up than usual.
- 2   I am so restless or agitated that it's hard to stay still
- 3   I am so restless or agitated that I have to keep moving or doing something.

12. Loss of Interest

- 0 I have not lost interest in other people or activities.
- 1 I am less interested in other people or things than before.
- 2 I have lost most of my interest in other people or things.
- 3 It's hard to get interested in anything.

13. Indecisiveness

- 0 I make decisions about as well as ever.
- 1 I find it more difficult to make decisions than usual.
- 2 I have much greater difficulty in making decisions than I used to.
- 3 I have trouble making any decisions.

14. Worthlessness

- 0 I do not feel I am worthless.
- 1 I don't consider myself as worthwhile and useful as I used to.
- 2 I feel more worthless as compared to other people.
- 3 I feel utterly worthless.

15. Loss of Energy

- 0 I have as much energy as ever.
- 1 I have less energy than I used to have.
- 2 I don't have enough energy to do very much.
- 3 I don't have enough energy to do anything.

16. Changes in Sleeping Pattern

- 0 I have not experienced any change in my sleeping pattern.
- 1 I sleep somewhat more than usual.
- 1b I sleep somewhat less than usual.
- 2a I sleep a lot more than usual.
- 2b I sleep a lot less than usual.
- 3a I sleep most of the day.
- 3b I wake up 1-2 hours early and can't get back to sleep.

17. Irritability

- 0 I am no more irritable than usual.
- 1 I am more irritable than usual.
- 2 I am much more irritable than usual.
- 3 I am irritable all the time.

18. Changes in Appetite

- 0 I have not experienced any change in my appetite.
- 1a My appetite is somewhat less than usual.
- 1b My appetite is somewhat greater than usual.
- 2a My appetite is much less than before.
- 2b My appetite is much greater than usual.
- 3a I have no appetite at all.
- 3b I crave food all the time.

19. Concentration Difficulty

- 0 I can concentrate as well as ever.
- 1 I can't concentrate as well as usual.
- 2 It's hard to keep my mind on anything for very long.
- 3 I find I can't concentrate on anything.

20. Tiredness of Fatigue

- 0 I am no more tired or fatigued than usual.
- 1 I get more tired or fatigued more easily than usual.
- 2 I am too tired or fatigued to do a lot of the things I used to do.
- 3 I am too tired or fatigued to do most of the things I used to do.

21. Loss of Interest in Sex

- 0 I have not noticed any recent change in my interest in sex.
- 1 I am less interested in sex than I used to be.
- 2 I am much less interested in sex now.
- 3 I have lost interest in sex completely.

Appendix C

Demographics Questionnaire

Please provide the following information about yourself by typing the answers in the boxes below to the best of your ability:

1. Sex or gender:

2. Ethnicity or race:

3. Age:

4. Year in college (e.g., sophomore):

5. High school GPA on a 4-point scale (e.g., 3.28):

6. Highest SAT Verbal/Critical Reading (or ACT English) score:

7. Highest SAT Math/Quantitative (or ACT Mathematics) score:

8. Current college GPA:

9. Relationship status:

10. Sexual orientation:

11. Religious affiliation, if any:

12. Are you a U.S. citizen or permanent resident?

13. Is English your native language?

14. Population size of the town where you grew up:

15. Income of family of origin (circle the range that applies):

$0-$25,000 $25,000-$50,000 $50,000-$75,000 $75,000-$100,000 $100,000 and up

16. Mother's education level, if applicable:

17. Father's education level, if applicable:

18. Number of siblings/step-siblings:

19. Birth order (e.g., second oldest):

20. Political orientation (in your own words):

Appendix D

Self-Defining Memory Instructions

For the next part of the study you will be asked to write out 10 self-defining memories and answer questions about them. This will take approximately one hour. A self-defining memory has the following attributes:

- It is at least one year old.
- It is a memory from your life that you can remember very clearly and that still feels important to you even as you think about it.
- It is a memory about an important enduring theme, issue, or conflict from your life. It is a memory that helps explain who you are as an individual and might be the memory you would tell someone else if you wanted that person to understand you in a profound way.
- It is a memory linked to other similar memories that share the same theme or concern.
- It may be a memory that is positive, negative, or both in how it makes you feel. The only important aspect is that it leads to strong feelings.
- It is a memory that you have thought about many times. It should be familiar to you like a picture you have studied or a song (happy or sad) you have learned by heart.

Here are a few examples of how your self-defining memories may serve a function in your life. These are not criteria for a self-defining memory and shouldn't influence which memories you use, but please keep them in mind as you think up and write out your memories.

- You may use memories to maintain a sense of self over time or to see how much you have changed from who you used to be
- You may use memories in relationships in order to get to know someone or to help them get to know you.
- You may use memories to help you solve problems or remember a lesson you learned in the past.

Appendix E

Memory Ratings

Please answer the follow questions about this memory:

1.   Approximately how many years ago did this memory take place?

2.   How positive do you feel in recalling this memory today?

0	1	2	3	4
Not at all positive	Slightly positive	Moderately positive	Rather positive	Very positive

3.   How negative do feel in recalling this memory today?

0	1	2	3	4
Not at all negative	Slightly negative	Moderately negative	Rather negative	Very negative

4.   How important is this memory to you?

0	1	2	3	4
Not at all important	Slightly important	Moderately important	Rather important	Very important

TALE Questions

Here we present several situations. Please choose one response on each scale to indicate how often, when you think back about this memory or talk about it, you do it for the reasons given. There are no right or wrong answers. Do not hesitate to use any of the points on the scale. If you never think back over this memory for the stated reason, circle "almost never." Please answer all three questions.

1.   When I want to understand how I have changed from who I was before.

Almost never   Seldom   Occasionally   Often   Very Frequently

2.   When I want to develop a closer relationship with someone.

Almost never   Seldom   Occasionally   Often   Very Frequently

3.   When I want to learn from my past mistakes.

Almost never   Seldom   Occasionally   Often   Very Frequently

Appendix F

RRS Questions

Please read these three items and think about whether you do each one when you think or talk about each of your memories. After reading each statement, write in the box below which memories the statement applies to. For example, if the second and third memories you wrote out apply to the first statement, you would write 2 and 3 in the box below it. Please think about what you generally do, not what you think you should do.

1.   Analyze this event and try to understand your feelings about it.

2.   Think about this memory and wish it had worked out a different way.

3.   Think about this memory and connect it to all of your shortcomings, failings, faults, and mistakes.

Appendix G

Informed Consent

      I hereby consent to participate in Mary Gover's honors thesis research under the supervision of Jefferson Singer, PhD of the psychology department at Connecticut College on ruminative response styles and meaning-making of self-defining memories. I understand that the first part of this research will involve completing a series of questionnaires online that will take approximately 30 minutes. If I elect to be considered for part 2 of the study, I understand that it will involve a 15 minute information session and an hour long session where I will write 10 self-defining memories and answer questions about them. I understand that I may decline to answer any questions in the study and can terminate my participation at any time without penalty.

      While the direct benefits of this research to society are unknown, this study will contribute to the research base on ruminative response styles and the content of self-defining memories. I will receive 30 minutes of course credit for participation in the first portion of this study and will be presented with an option of being considered for part 2 of this study for an additional 75 minutes of credit.

      I understand that there are no known risks for participating in this study. I understand that although my data will be kept confidential in a password-protected document and computer, my answers are not anonymous. My email will be connected with my data until all data is collected for this study in order to connect data from both parts of the study. I also understand that the only time confidentiality will be broken is if my answers indicate that I am a danger to myself or others. I understand that after all the data has been collected for this study, my data will be furthermore identified by a code and not by my email for statistical analyses. I understand that this study is not meant to gather information about specific individuals and that my responses will be combined with other participants' data for the purpose of statistical analyses. I consent to publication of the study results as long as the identity of all participants is protected.

      I understand that I may contact the researcher, Mary Gover, at any point during the study with any questions or concerns I may have either by email at mgover@conncoll.edu or by cell phone at 203-417-0287. I can also contact Professor Singer at Jefferson.Singer@conncoll.edu or at 860-439-2343. I understand that this research has been approved by the Connecticut College Human Subjects Institutional Review Board (IRB) and that I can address any concerns about this study to its chairperson, Professor Jason Nier (Jason.nier@conncoll.edu, 860-439-5057).

I am at least 18 years of age and have read the explanations and assurances above and I voluntarily consent to participate in this study dealing with response styles and memories. Typing my name below will be considered a signature verifying my consent to proceed.

Name:_____

Date:_____

Appendix H

Debriefing Form (Part 1)

Thank you for participating in the first phase of this study on ruminative response styles and self-defining memories. Rumination is a response to negative mood characterized by a problematic self-focus, specifically on one's negative symptoms and their repercussions. In this research I am looking to see if individuals who tend to use this response style differ from low-ruminators in whether they are able to derive meaning and functionality from their self-defining memories. I am also looking at the content of self-defining memories to see if those of high ruminators tend to be less specific, positive, and coherent than those of low ruminators.

Individuals who do elect to participate in part 2 of the study will be asked to come up with 10 self-defining memories and answer questions about them. I ask that you please refrain from discussing this study with peers until data collection is finished as not to interfere with the second phase of this research.

If you are interested in learning more about this topic and want to read the literature in this area, please contact me at mgover@conncoll.edu or at 203-417-0287.
Listed below are two sources you may want to consult to learn more about this topic.

Raes, F., Hermans, D., Williams, J. M., Beyers, W., Brunfaut, E., & Eelen, P. (2006). Reduced autobiographical memory specificity and rumination in predicting the course of depression. *Journal of Abnormal Psychology, 115*, 699-704.

Lyubomirsky, S., Caldwell, N. D., & Nolen-Hoeksema, S. (1998). Effects of ruminative and distracting responses to depressed mood on retrieval of autobiographical memories. *Journal of Personality and Social Psychology, 25***,** 166–177

Any concerns about this study may be addressed to Professor Jason Nier (Jason.nier@conncoll.edu, 860-439-5057), chairperson of the Connecticut College Institutional Review Board (IRB).

In this part of the study we asked you about certain symptoms of depression. If you are feeling particularly sad or blue, please contact the Connecticut College Counseling Services in the Warnshuis Building (information below). We may send a follow up email based on the information you provided in the questionnaire reminding you of this information.

Student Counseling Services:
Phone: 860-439-4587
Address: Student Counseling Services, Warnshuis Building, 270 Mohegan Avenue, New London, CT 06320-4196

National Suicide Crisis Line: 1-800-273-TALK (8255)

Appendix I
Debriefing Form (Part 2)

Thank you for participating in this study on ruminative response styles and self-defining memories. Rumination is a response to negative mood characterized by a problematic self-focus, specifically on one's negative symptoms and their repercussions. In this research I am looking to see if individuals who tend to use this response style differ from low-ruminators in whether they are able to derive meaning and functionality from their self-defining memories. I am also looking at the content of self-defining memories to see if those of high ruminators tend to be less specific, positive, and coherent than those of low ruminators.

If you are interested in learning more about this topic and want to read the literature in this area, please contact me at mgover@conncoll.edu or at 203-417-0287.
Listed below are two sources you may want to consult to learn more about this topic.

Raes, F., Hermans, D., Williams, J. M., Beyers, W., Brunfaut, E., & Eelen, P. (2006). Reduced autobiographical memory specificity and rumination in predicting the course of depression. *Journal of Abnormal Psychology, 115*, 699-704.

Lyubomirsky, S., Caldwell, N. D., & Nolen-Hoeksema, S. (1998). Effects of ruminative and distracting responses to depressed mood on retrieval of autobiographical memories. *Journal of Personality and Social Psychology, 25*, 166–177

Any concerns about this study may be addressed to Professor Jason Nier (Jason.nier@conncoll.edu, 860-439-5057), chairperson of the Connecticut College Institutional Review Board (IRB).

In part 1 of this study we asked you about certain symptoms of depression. Once again, if you are feeling particularly sad or blue, please contact the Connecticut College Counseling Services in the Warnshuis Building (information below).

Student Counseling Services:
Phone: 860-439-4587
Address: Student Counseling Services, Warnshuis Building, 270 Mohegan Avenue, New London, CT 06320-4196

National Suicide Crisis Line: 1-800-273-TALK (8255)