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A roadmap to rumination: A review of the definition, assessment, and conceptualization of this multifaceted construct

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Abstract

Rumination has been widely studied and is a crucial component in the study of cognitive vulnerabilities to depression. However, rumination means different things in the context of different theories, and has not been uniformly defined or measured. This article aims to review models of rumination, as well as the various ways in which it is assessed. The models are compared and contrasted with respect to several important dimensions of rumination. Guidelines to consider in the selection of a model and measure of rumination are presented, and suggestions for the conceptualization of rumination are offered. In addition, rumination's relation to other similar constructs is evaluated. Finally, future directions for the study of ruminative phenomena are presented. It is hoped that this article will be a useful guide to those interested in studying the multifaceted construct of rumination.

Keywords

Rumination; Depression; Repetitive thought

1. Introduction

Over the past two decades, rumination has evolved as a critical construct in understanding the development and persistence of depressed mood. Hundreds of articles have addressed rumination related topics, and consistent evidence for the role of ruminative thought processes in depression has emerged. Although the literature supporting rumination is robust, there is no unified definition of rumination or standard way of measuring it. In addition, it remains unclear how rumination relates to other similar constructs, such as private self-consciousness, emotion focused coping, worry, or repetitive thought processes more generally. Given the important role rumination has played in depression research, the goal of this article is to provide a comprehensive review of the varying definitions of rumination and an evaluation of current measures of rumination. The various models of rumination are compared and contrasted with respect to several important dimensions and the relationship of rumination to other similar constructs is explored. It is hoped that a comprehensive summary of rumination and related constructs will enable future researchers to more accurately identify and clarify their definition and measurement of the construct, and thereby enhance rumination's utility in understanding depression and other mental health outcomes.

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2. Models of rumination

Several models of rumination have been presented. Table 1 clarifies how these models define rumination, identifies the measure that is appropriate given the construal of the construct, and briefly summarizes findings related to the model.

The most prolific theory of rumination is Nolen-Hoeksema's (1991) Response Styles Theory (RST, Table 1). In RST, rumination consists of repetitively thinking about the causes, consequences, and symptoms of one's negative affect. Although this is the most widely used and empirically supported conceptualization of rumination, some aspects of the theory, such as the distraction component, have received mixed support (Butler & Nolen-Hoeksema, 1994; Nolen-Hoeksema & Morrow, 1991). In addition, the Response Styles Questionnaire (RSQ) has been criticized for its overlap with the Beck Depression Inventory (Beck, Rush, Shaw, & Emery, 1979), its overlap with worry, and its overlap with positive forms of repetitive thought such as reflection. The RST also does not address how rumination fits in with other biological or cognitive processes like attention or metacognitive beliefs.

A related model is the Rumination on Sadness conceptualization which defines rumination as repetitive thinking about sadness, and circumstances related to one's sadness (Conway, Csank, Holm, & Blake, 2000; Table 1). This model is useful because the measure of rumination is parsimonious and self-contained, and it specifically predicts sadness. However, the Rumination on Sadness Scale has not been widely used; therefore, it is not clear how well it specifies rumination just in response to sadness, and whether or not it is useful in the prediction of depression or other psychopathology.

The Stress-Reactive model of rumination may be a useful adjunct to RST in that rumination (on negative, event-related, inferences) occurs after the experience of a stressful event (Alloy et al., 2000; Table 1). One advantage to this model is that it is highly similar to RST, but may capture ruminative phenomena before the presence of negative affect. One potential limitation of this model is that it proposes that ruminative content consists of thoughts related to the stressor, and may not capture other important ruminative themes such as memories of other stressors, or self-deprecating thoughts not related to the stressor.

Post-event rumination is another model that arose from the Social Phobia literature and proposes that rumination arises in response to social interactions (Table 1). Although post-event processing contributes to the understanding of cognitive processes in social anxiety, it is unclear if it is specific to social phobia, or if it may help assess some of the overlap in thought processes characteristic of both anxiety and depression. Further, the measures of post-event processing require continued testing to determine their relative utility in assessing this construct.

The Goal Progress Theory (Martin, Tesser, & McIntosh, 1993; Table 1) offers a unique way of viewing rumination, not as a reaction to a mood state per se, but as a response to failure to progress satisfactorily towards a goal. Although the theory proposes that rumination and depression are both driven by the failure experience, studies have demonstrated the stable presence of rumination in the absence of current or perceived failure (Nolen-Hoeksema & Morrow, 1991; Spasojevic & Alloy, 2001). In addition, the measure of rumination in this model (Scott McIntosh Rumination Inventory, SMRI) taps several aspects of rumination including cognition, meta-cognitions about rumination (is it distracting or distressing), and motivation. In this way, rumination in this model is construed as a broad and multi-faceted process including both cognitions and action tendencies.

The Self-Regulatory Executive Function (S-REF) theory of rumination (Table 1) offers a broader view, embedded in a larger context of the S-REF model of emotional disorder, which

includes attention, cognition regulation, beliefs about emotion regulation strategies, and interactions between various levels of cognitive processing (Wells & Matthews, 1994, 1996). The model integrates metacognitive beliefs into its conceptualization of rumination, which may play a large role in the development of rumination as a stable response style. One potential problem of this model is that it overlaps with many other constructs (e.g., worry, intrusive thoughts, coping). In addition, rumination is viewed as a subset of worry; however, rumination has been shown to differ from worry in important ways that argue for its distinction from worry (see the section on worry for more details). The S-REF model also proposes that rumination is a multi-faceted construct, and, thus, many measures are required to capture rumination (see Table 1 for brief descriptions of measures).

Rumination has also been described as one of two forms of self-focus, a maladaptive form labeled conceptual-evaluative (rumination), and an adaptive form labeled experiential self-focus (Watkins, 2004a). This model places rumination in the context of a larger theory of self-focus; however, this conceptualization does not rule out the possibility that the content of thought is similar across the two self-focusing styles, but that the motivation driving the styles is different. Thus, it is important in this model to assess metacognitive beliefs driving the selection of emotion processing mode.

Other models have examined ruminative responses to stress. Fritz's (1999; Table 1) multi-dimensional conceptualization of rumination in response to trauma expands the utility of rumination by relating it to topics in health psychology, and considering the impact that recursive negative thinking may have on physical health. However, further research is needed using this measure to determine its ultimate value. Finally, Beckman & Kellman (2004; Table 1) view of rumination as an obstacle to self-regulation may be useful for studying rumination as a homeostatic tool in response to stress; however, it captures many aspects of response including behaviors, thoughts, and motivational drives. It places rumination in the larger context of self-regulation, and considers it one of many self-regulatory strategies, but more studies are needed to fully elucidate its usefulness.

Rumination has also been described as a type of cognitive emotion regulation (Garnefski, Kraaij, & Spinhoven, 2001). This model may be useful in that it uses a broad measure that captures various types of cognitive emotion regulation (such as acceptance, appraisal, etc.). However, it is possible that some of these strategies may overlap, for example, ruminative thought could contain themes of self-blame or catastrophizing; thus, the potential covariance of these subscales must be considered when using this measure. This model also places rumination in the context of emotion regulation, and does not imply that it operates independently of other regulatory strategies, thereby offering a more complete picture of rumination.

3. Measures of rumination

As presented in Table 2, measures from various areas of research have also been used to describe ruminative phenomena. Table 2 provides a context for these various ways of measuring rumination and presents findings related to each measure.

The rumination scale of the Responses to Stress Questionnaire places rumination in the larger context of coping and emotion regulation (Conner-Smith, Compas, Wadsworth, Thompsen, & Saltzman, 2000). However, it is supposed that rumination is an involuntary coping process that is unconsciously employed; yet, this dismisses the potential influence of metacognitive beliefs in the selection of coping strategies. Given that beliefs have been shown to relate to use of rumination (Papageorgiou & Wells, 2003), this may be an inaccurate way of viewing ruminative processes. Finally, this measure has not been widely used with adults, so it may be more appropriate for youth samples.

Other measures of responses to stressful events have also utilized the term “rumination.” Although the Impact of Events Scale (Horowitz, Wilner, & Alvarez, 1979) is typically used to predict trauma related symptoms, ASD or PTSD, it has also been linked to depressive symptoms as well as other indices of depressive rumination (Friedberg, Adonis, VonBergen, & Suchday, 2005; Siegle, Moore, & Thase, 2004). However, in a factor analysis with multiple indices of rumination, it did not uniquely contribute to the prediction of depressive symptoms, suggesting that it may be more appropriate for those interested in assessing repetitive thinking about trauma specifically (Siegle, Moore, & Thase, 2004). The Response to Intrusions Questionnaire (Clossy & Ehlers, 1999) is a meta-cognitive index of responses to intrusive, trauma-related thoughts. Given the low reliability of the scale, and the lack of predictive value of the “dwelling” item, it is important that this measure of rumination be used with caution. Luminet’s (2004) Retrospective Ruminations Questionnaire indexes rumination in response to a negative life event. This measure is also multifaceted and assesses behavior (active attempts to dismiss the thoughts) and metacognitive beliefs (controllability), but has not been extensively used.

The Emotion Control Questionnaire (ECQ; Roger & Najarian, 1989) assesses rumination in the context of personality. Rumination, as indexed by the rehearsal scale of the ECQ, is a generic dysfunctional process in response to emotion that contributes to various aspects of mental health (Table 2). It provides a larger definition of potential triggering events, and may be a useful, general assessment tool for a broad conceptualization of rumination.

3.1. Factor analyses of rumination

To better understand the nature of rumination, several researchers have performed factor analyses of rumination measures that highlight important sub-factors within commonly used measures. Evidence of a sub-factor that directly corresponds to depressive symptoms has been reported (Treyner, Gonzales, & Nolen-Hoeksema, 2003; Roberts, Gilboa, & Gotlib, 1998), as well as a distinction between harmful and helpful sub-types of ruminative thought (brooding vs. reflection, Treyner et al., 2003; introspection/self-isolation and self-blame, Roberts et al., 1998; rumination vs. reflection, Trapnell & Campbell, 1999). Of note, several of these models highlight the motivation behind thinking style, and not the content, which may be more difficult to quantify (Roberts et al., 1998; Trapnell & Campbell, 1999; Watkins, 2004a,b). As a whole, these studies present a convincing argument for the dichotomization of repetitive thinking about the self.

Two factor analytic studies have also attempted to meaningfully organize the various measures of rumination. Siegle et al. (2004) examined multiple measures of rumination related constructs and reported little intrapersonal consistency in the measures, in that some individuals would score high on some indices of rumination and low on others. There was, however, a relatively high degree of internal consistency across the scales, suggesting that for any one individual, the scales may index different constructs, but in aggregate, they reliably index the construct of rumination. Another factor analysis (Segerstrom, Stanton, Alden, & Shortridge, 2003) reported positive correlations between several measures of rumination, and that the measures clustered along 2 dimensions, one that reflected emotional valence of the repetitive thought (negative vs. positive), and another that reflected motivation for repetitive thought (searching vs. problem-solving). The authors also reported two other, less robust, dimensions of repetitive thought, one that reflects the content of the repetitive thought (interpersonal vs. achievement content) and one that was related to the total amount of repetitive thought experienced. As a whole, these studies indicate that investigators consider using multiple measures to index rumination and consider where the repetitive thought constructs being measured fall on the valence and purpose dimensions.

3.1.1. Important dimensions that characterize rumination—Given that there are so many conceptualizations of rumination in the literature, how do they relate to and differ from one another? In this section, several dimensions of ruminative thought are outlined for researchers' consideration when selecting a model and measure of rumination.

3.1.1.1. Stability of rumination: Theories differ in the degree to which they view rumination as a stable response style (RST; post-event processing; Luminet, Rime, Bagby, & Taylor, 2004; Roberts et al., 1998; Trapnell & Campbell, 1999; Treynor et al., 2003; Watkins, 2004a); or as a transitive, state-like, phenomenon. The S-REF and goal progress models describe rumination as a more universal process that all individuals engage in to varying degrees and with variability in outcomes (Martin, 1999; Martin, Shrira, & Startup, 2004; Martin et al., 1993; Wells & Matthews, 1994, 1996).

Direct assessment of rumination's stability has demonstrated significant retest reliability for the RSQ administered 2–3 months, 5 months, and 1 year apart (.56, Kueher & Weber, 1999; .80, Nolen-Hoeksema, Parker, & Larson, 1994; .62, Nolen-Hoeksema, 2000; and .47, Just & Alloy, 1997). In contrast, one study reported that rumination did not evidence adequate stability over 6 months, and that the stability of scores on the RSQ varied with severity of depressive symptoms (Kasch, Klein, & Lara, 2001). One potential explanation for these results lies in the well documented overlap between several items on the RSQ and depressive symptoms (Roberts et al., 1998; Trapnell & Campbell, 1999; Treynor et al., 2003); it may be that an index of rumination independent of symptoms of depression (e.g., the brooding subscale of the RSQ the rumination subscale of the Rumination and Reflection scale, etc.) would exhibit less covariation with depressive symptoms. It is important to note in this discussion that stability of rumination refers to an individual's propensity to ruminate when faced with a trigger, and does not propose that an individual will be ruminating constantly. The RSQ is the only index that has been assessed thoroughly for stability, and it also asks individuals to report on their usual responses to negative affect.

Conversely, other indices of rumination assess ruminative tendencies in relationship to a specific trigger, such as a traumatic or stressful event. Although this may imply that rumination is more transitory, it may also be that rumination in relation to a traumatic event is rarer than rumination in relation to sad mood, and therefore, individuals are not able to accurately report on what they would, “typically do.” In other words, even though the measures are assessing responses to a specific event, individuals may respond to similar triggering events comparably. In line with this, a measure of rumination in response to a stressor (Responses to Stress Questionnaire) also demonstrated test–retest reliability over 2 weeks (Conner-Smith et al., 2000).

Given that rumination (as indexed by the RSQ) has been consistently reported in response to negative mood over varying intervals of time, rumination may be best conceptualized as a stable, individual trait. Although it is expected that level of rumination will vary according to the presence or absence of a trigger, an individual who responds to triggering events with rumination will likely continue to do so unless rumination itself, or the metacognitive beliefs that contribute to selection of rumination as a coping strategy, are targeted in treatment. In line with this, several methods of treating rumination have been developed, and it has been suggested that treatment of rumination is imperative in successful treatment of depression (Purdon, 2004; Ramel, Gordon, Carmona, & McQuaid, 2004; Wells & Papageorgiou, 2004).

3.1.1.2. Trigger for initiation of the ruminative cycle: Yet another dimension on which the models differ is what event, external or internal, triggers ruminative thinking (see descriptions of each model for details). Rumination in response to negative affect (both symptoms of depression as well as in individuals with clinical depression) has been well documented, and

rumination has not been shown to contribute to depression in the absence of negative affect, suggesting that negative mood is a necessary component for ruminative thought processes in RST (Lyubomirsky & Nolen-Hoeksema, 1993, 1995; Nolen-Hoeksema & Morrow, 1993). There is also evidence that stress-reactive rumination is a better predictor of later depression than the rumination subscale of the RSQ (Robinson & Alloy, 2003). Similarly, a literature has developed on post-event processing, which links later ruminative thinking to a stressful interpersonal interaction, again highlighting the important role of stress (Abbot & Rapee, 2004; Edwards, Rapee, & Franklin, 2003; Harvey, Ehlers, & Clark, 2005; Lundh & Sperling, 2002; Mellings & Alden, 2000; Rachman, Gruter-Andrew, & Shafran, 2000). In addition, individuals who are high in rumination may also be more likely to interpret events in their lives as stressful (Lok & Bishop, 1999). Evidence has also been presented for rumination in response to a lack of goal progress (Martin et al., 1993; Zeigarnik, 1983). This would suggest that information related to incomplete goals is likely to remain on one's mind, perhaps as rumination. There also has been some support for the role of metacognitive beliefs; positive and negative beliefs about rumination have been linked to depressive rumination (Papageorgiou & Wells, 2001b, 2003).

There is much potential room for overlap among the models. For example, attainment or non-attainment of a goal could be construed as a subset of target vs. actual status if one's target is completion of a goal. Similarly, happiness may be one's goal and/or target status, and therefore, unhappiness (sadness, negative affect, stress, anxiety, etc.) could potentially initiate a self-regulatory cycle. Likewise, a stressful event could easily be seen as incongruent with one's goal or target status of maintaining physical or psychological integrity. In a similar vein, stress and anxiety could all potentially be encompassed by the label negative affect, and may differ from one's target status of being happy, or may result from awareness of differing from one's desired status.

Given the common characteristics of these triggering events, a larger view of the initiation of a ruminative cycle may be appropriate. Specifically, rumination may be best characterized as a response to the awareness of a difference between one's current status and one's target status (as in the S-REF model of rumination). This model captures both internal (e.g., feeling states, such as happy vs. sad) and external (e.g., negative life events, such as safe vs. unsafe) triggers of rumination, and encompasses other hypothesized triggers, such as metacognitive beliefs regarding coping styles may be activated in response to a perceived mismatch in current and desired status. Further, awareness of this mismatch may, in and of itself, generate negative affect.

3.1.1.3. Content of ruminative thought: Theories of rumination also differ in their predictions regarding the content of ruminative thought. Some models propose that rumination is focused on negative feeling states and/or the circumstances surrounding that emotion (RST, rumination on sadness, Trapnell and Campbell, stress-reactive rumination, post-event processing models). Rumination in other models focuses on discrepancies between one's current and desired status (goal progress, conceptual evaluative model of rumination). In the S-REF model, the focus of rumination is hypothesized to be broader and can include any self-referent information, particularly information that helps one make sense of the current situation. Finally, other models propose that it is the negative themes of uncontrollability and harm in metacognitions that are most important.

Few studies have actually analyzed the content of ruminative thought; however, a higher number of causal words in written accounts of rumination has been reported, suggesting that looking for precipitants or sources of current distress is a component of ruminative thought (Watkins, 2004a). A caveat to this study is that one cannot be sure that written content mirrors cognitive content. Although several models above suggest that rumination may involve

attempts at problem-solving, rumination has been shown to have less focus on problem-solving than other repetitive thought processes, such as worry, and is associated with less confidence in problem-solving ability (Papageorgiou & Wells, 1999, 2004). There is also evidence that depressive thinking in general is related to themes of loss (Beck, Brown, Steer, Eidelson, & Riskind, 1987). Rumination also differs from worry in that it is highly negative in content, and, “dwelling on the negative,” may be a defining component of rumination (Fresco, Frankel, Mennin, Turk, & Heimberg, 2002). Watkins (2008) has demonstrated that the content of rumination is characterized by an abstract level of construal, which includes general, non-specific representations of an event or action; a focus on the value of goals or outcomes; global characteristics or personality traits; and/or “why” aspects of a particular situation or action.

Differences have also arisen in terms of the time period focus of ruminative thinking, with several theories supposing that rumination can vacillate between past, current, and future focus, and others assuming that ruminative content is focused on the past or present. It is consistently reported that rumination, in comparison to worry, contains past-related thoughts (Papageorgiou & Wells, 1999; Watkins, Moulds, & Mackintosh, 2005). However, a more recent study found that time orientation changes over the course of rumination, such that individuals begin with a past focus, but increase in present and future related thoughts over the course of ruminating (McLaughlin, Borkovec, & Sibrava, 2007). Thus, rumination may be more complicated than previously thought, and not necessarily wholly past focused.

The content of rumination may be best characterized by a focus on differences between current status and target status. For example, ruminative thought that emphasizes the causes and symptoms of depressed mood may be seen as cognitive elaboration of one's current state. Similarly, focus on current sadness, or reactions and precipitants to a stressful event, may be construed as related to current status. In addition, thoughts about the consequences of current mood state or of a negative event may be conceptualized as thoughts related to the negative impact of current status on attainment of desired status. In addition, a focus on current status, as well as target status, may help explain the change in time period focus observed in rumination. This is also compatible with Watkins (2008) description of abstract repetitive thought in that it is likely to include a focus on the importance of goals related to target status, and may include “why” questions related to the discrepancy between current and desired outcome.

3.1.1.4. Specificity of rumination to depression: Although rumination is generally considered in relation to depression, several studies have demonstrated a lack of specificity to depression, particularly overlap with symptoms of anxiety (see Tables 1 and 2). Relationships between rumination and various kinds of psychopathology, including symptoms of depression and social phobia (post-event processing); trauma symptoms and depression (IES); anxiety, depression, worry and hallucinations (MCQ); worry, GAD and depression (ATI); and anxiety, PTSD, GAD, panic disorder, social phobia, OCD, ASD, and depression (TCQ) have also been reported. Some theorists view rumination as impacting several aspects of both mental and physical health; rumination (as measured by the ECQ and CERQ) has been related to depression, anxiety, anger, health, and levels of stress. Rumination is also related to more general potential outcome measures, including behavioral and emotional problems such as depression, externalizing behavior, anger, and anxiety.

Given the range of potential outcome variables, the variability in views regarding the specificity of rumination, as well as the differing empirical findings regarding specificity of the various measures of rumination, it is critical when developing hypotheses about rumination that one considers the degree to which rumination is assumed to be specific to depression. This will guide appropriate assessment of both ruminative thought processes and outcome. That being said, given the well-documented overlap of symptoms of depression and anxiety, researchers

should consider consistently including measures of both depression and anxiety when investigating rumination. In addition, if the broader characterization of rumination proposed here is used, a larger range of outcome measures is appropriate.

3.1.1.5. Interplay with meta-cognitions: Theories also differ in the emphasis they place on metacognitive processes in rumination. Some models do not address the role of metacognitions (RST, rumination on sadness, stress reactive rumination, goal progress theory), whereas others view metacognitions as key to understanding both the initiation of rumination and its outcome (S-REF). A role for metacognitive beliefs has been demonstrated in the literature: positive and negative beliefs about rumination have been significantly related to rumination and depression (Papageorgiou & Wells, 2001b, 2003) and levels of rumination have been related to symptoms of PTSD (Clossy & Ehlers, 1999; Dunmore, Clark, & Ehlers, 2001, Ehlers, Mayou, & Bryant, 1998; Steil & Ehlers, 2000).

Although many models of rumination do not specifically address metacognitions, the hypothesis that beliefs about coping may influence the selection of rumination, or contribute to its harmfulness, is complimentary to many theories of rumination (RST, Stress-Reactive Rumination, the Goal-Progress Model, Post-Event Processing, etc.). For example, the RST suggests that rumination begins as a response to negative affect; however, it may be that positive metacognitive beliefs about rumination guide the selection of rumination as a response to negative mood. The link between rumination and positive metacognitive beliefs supports this (Papageorgiou & Wells, 2001b, 2003). Given that there are many measures of metacognitive beliefs available, such as the Metacognitions Questionnaire (Cartwright-Hatton & Wells, 1997), Thought Control Questionnaire (Wells & Davies, 1994), Responses to Intrusions Questionnaire (Clossy & Ehlers, 1999), and the Positive Beliefs about Rumination Scale and the Negative Beliefs about Rumination Scale (Papageorgiou & Wells, 2001b), future researchers should consider to what extent they expect metacognitive processes to affect rumination in their conceptualization, and consider including a measure of metacognitions in their research.

3.2. Function of rumination

Another area in which theories differ is how they conceptualize the function of rumination. Several theories suggest that rumination is a misguided emotion regulation strategy, specifically, that individuals engage in rumination because they believe it will help them solve problems, analyze and/or eliminate discrepancies between current and desired status, aid in goal attainment, or process information related to stressful or traumatic events. Little research has directly addressed the function of rumination; however, rumination has been linked to right hemispheric activation, which may indicate active searching for methods of goal attainment, and support for the role of beliefs in the selection of ruminative strategies has been reported (Martin et al., 2004; Papageorgiou & Wells, 2001a,b). Overall, however, the purpose of rumination remains unclear and largely uninvestigated.

Within the context of emotion regulation and coping, it may be that rumination is best characterized as an avoidant coping strategy. Hayes and colleagues (1996) have argued for an experiential avoidance conceptualization of many forms of psychopathology. They suggest that the avoidance of private experiences is detrimental because it prevents individuals from responding to aversive stimuli and often has the paradoxical effect of increasing avoided material (Hayes et al., 2004; Wenzlaff & Wegner, 2000). Applied to rumination, high ruminators may avoid the private experience of negative affect through rumination and in so doing, may actually worsen their negative mood. Consistent with this hypothesis, rumination has been linked to difficulty with both problem solving and motivation.

Evidence for a relationship between rumination and other emotional avoidance strategies has been obtained. For example, rumination has been linked to increased alcohol abuse (another emotional avoidance strategy), which indicates a pattern of avoidant coping strategies in high ruminating individuals (Nolen-Hoeksema & Harrell, 2002). In addition, ruminators were more likely than non-ruminators to report drinking in order to cope with negative mood. Rumination also relates to delayed response to symptoms of breast cancer, which supports the hypothesis that high ruminating individuals avoid dealing with emotionally threatening material (Lyubomirsky, Kasri, Chang & Chung, 2006). Further, individuals who engage in post-event processing tend to avoid social situations that are similar to the one that initiated rumination (Mellings & Alden, 2000; Rachman et al., 2000), also supporting a propensity for avoidant behavior in ruminators.

Direct experiencing of emotions, the opposite of avoidance, is associated with better outcomes than mulling over the causes and consequences of events, and mindfulness training reduces rumination in individuals with mood disorders (Broderick, 2005; Ramel, Gordon, Carmona, & McQuaid, 2004; Watkins, 2004a). Extrapolating from these findings, it may be that rumination impedes more adaptive experiencing of negative affect, and in so doing, perpetuates depression. Although this conceptualization of the function of rumination is promising, further research is needed to ascertain the role of avoidance in ruminative thought.

3.3. Relationship to other related constructs

Another important issue in exploring the rumination literature is clarifying how rumination relates to other constructs that may appear similar or overlap conceptually. In this section, we define each of these related constructs and review how each are related to each other and to rumination.

3.3.1. Negative automatic thoughts—Rumination has been compared to negative automatic thoughts, defined as repetitive thoughts that contain themes of personal loss or failure. Nolen-Hoeksema (2004) contends that rumination (as defined in RST) is distinct from negative automatic thoughts, but suggests that rumination may, in addition to analysis of symptoms, causes, and consequences, contain negative themes like those in automatic thoughts. Similarly, Papageorgiou and Wells (2004) suggest that rumination (as defined by the S-REF model) is distinct from negative automatic thoughts in that rumination is a lengthy, repetitive thought cycle, whereas automatic thoughts are more transitory in nature and are more centered on themes of loss and failure. In support of this, the authors cite studies that have found rumination to predict depression even when negative cognitions are controlled, suggesting that these constructs do not wholly overlap and have different predictive value (Nolen-Hoeksema et al., 1994; Spasojevic & Alloy, 2001). Despite Nolen-Hoeksema's (2004) argument that rumination and negative automatic thoughts are distinct phenomena, the Response Style Questionnaire has been criticized for its conceptual overlap with negative automatic thoughts (Conway et al., 2000). Conversely, if the proposal that ruminative content focuses on differences between current and target status is considered, negative attributions focused on loss or failure may be viewed as ruminative content. Further, it may be that rumination is better conceptualized as the repetitive process, whereas negative automatic thoughts may be part of the content that is recursively dwelled upon.

3.3.2. Private self-consciousness—Private self-consciousness is typically defined as a trait-like tendency to focus on oneself independent of mood state (Fenigstein, Scheier, & Buss, 1975). According to this definition, private self-consciousness conceptually overlaps with other constructs such as self-focused attention. Although some researchers have proposed that rumination may be a subtype of private self-consciousness (Trapnell & Campbell, 1999), others have argued for a distinction between the two processes. For example, in RST, rumination and

private self-consciousness are seen as related, but distinct, in that they differentially predict depression (rumination is the stronger predictor; Nolen-Hoeksema, 2004; Robinson & Alloy, 2003). Papageorgiou and Wells (2004) also distinguish between rumination and private self-consciousness; the authors propose that private self-consciousness is mood state independent and focused on the self, whereas rumination is focused on coping in response to goal-relevant information and does not have to be entirely self-relevant but can contain thoughts about stress, coping, circumstances, mood, etc. In support of this, rumination was a better predictor of depression than private self-consciousness, again supporting differentiation of the constructs (Nolen-Hoeksema & Morrow, 1993; Robinson & Alloy, 2003; Spasojevic & Alloy, 2001).

Although rumination and private self-consciousness are not synonymous, it may be that rumination is one of many types of private self-consciousness. Specifically, whereas private self-consciousness may occur independent of mood state, or in response to several mood states, rumination may be a type of self-consciousness that is initiated by negative mood state, or recognition of a discrepancy between current and desired states. If rumination is a type of private self-consciousness that is activated by displeasure with one's current status, it should better predict depression than the larger and more multi-faceted construct of private self-consciousness (which may include positive self-focus such as reflection). Further research is necessary to clarify whether or not private self-consciousness is an appropriate umbrella for related forms of repetitive thinking such as rumination and reflection.

3.3.3. Self-focus/self-focused attention—Rumination has also been related to self-focus, or attention directed to the self. A trait tendency to self-focus is seen as an indicator of private self-consciousness. Carver (1979) defines self-focus as self-directed attention that can take on several forms, such as focus on internal perceptual events, increased awareness of present or past behavior, attitudes, or memories of previous events. Self-focused attention has been related to many forms of psychopathology, and has a demonstrated relationship with depression (Ingram, 1990). In the rumination on sadness model, rumination is seen as a type of self-reflection, or self-focused attention. Similarly, Watkins (2004a) views conceptual-evaluative self-focus as equivalent to ruminative thinking. In support of this, a relationship between conceptual-evaluative self-focus and depressive symptoms following a distressing event has been demonstrated (Watkins, 2004a). Conversely, rumination (as measured by the Rumination and Reflection Questionnaire) was not related to performance on tasks that elicit self-focus, and thus, may be better construed as a self-focused motivation process (Silvia, Eichstaedt, & Phillips, 2005). Given that many definitions of rumination do not specify that rumination contains solely self-focused content, it may be that self-focus is only a small portion of the potential content of ruminative thinking, regardless of the specific definition used. Conversely, if the content of rumination is related to current vs. target status (which is related to the self), self-focus, similar to private self-consciousness, may be an appropriate umbrella under which rumination, reflection, and other types of repetitive thinking fall. Further research is needed to elucidate the relationship between rumination and self-focus.

3.3.4. Repetitive thought—Rumination has also been characterized as one of many types of repetitive thought, defined as, “thinking attentively, repetitively, or frequently about oneself and one's world,” (Segerstrom et al., 2003, pp. 909). According to this conceptualization, repetitive thought can include both adaptive and maladaptive cognitive responses such as worry, rumination, depressive rumination, reflection, emotional processing of trauma, planning, rehearsal, working through, and intrusive thoughts. A meta-analysis of several types of repetitive thought concluded that repetitive thought can be described by 2 dimensions, valence and purpose, and rumination was closely related to worry, intrusions, self-reproach, neuroticism and rehearsal (Segerstrom et al., 2003). In a compelling review of repetitive thought, Watkins (2008) proposed a model for differentiating harmful and helpful forms of repetitive thinking: the elaborated control theory. Specifically, he suggested that repetitive

thinking varies along 3 dimensions (valence, context, and level of construal), and rumination is negatively valenced, occurs in a negative context, and is characterized by an abstract level of construal. Evidence for these characteristics of rumination have been described elsewhere (Watkins, 2008; Watkins, Moberly, & Moulds, 2008). In sum, it is likely that rumination may be one of many maladaptive types of self-relevant repetitive thinking.

3.3.5. Intrusive thought—Both rumination and intrusive thoughts have been deemed types of repetitive thought (Segerstrom et al., 2003), but intrusive thoughts have also been related to ruminative thinking styles. Intrusive thinking is defined as, “repetitive thoughts that are particularly vivid, occur in a non-voluntary way, interrupt ongoing activities, are difficult to control, and require efforts at suppression,” (Horowitz, 1975). This definition includes not only cognitive processes, but also metacognitions about the thoughts, and behavioral action tendencies. Intrusive thoughts have also been characterized as a type of involuntary-coping, and are often described in relation to trauma. Although Luminet (2004) describes “intrusive ruminations,” and suggests that intrusiveness may be a dimensional descriptor of ruminative thoughts, other researchers view rumination and intrusiveness as separate (Beckman & Kellman, 2004). Evidence for a distinction in the content and emotions associated with intrusive thoughts and rumination has also been reported (Michael, Halligan, Clark, & Ehlers, 2007). Intrusive thoughts have also been related to depressive symptoms, although they do not predict depressive symptoms once other indices of rumination (RRS, and the TCQ worry subscale) are controlled (Siegle et al., 2004). This would suggest that there is some meaningful distinction between rumination and intrusive thoughts, although further research is necessary to better characterize the relationship between these two constructs. It is likely, however, that individuals differ on the extent to which they interpret ruminative thoughts as intrusive and this may contribute to the perceived harmfulness of rumination (as in the Metacognitive Model of Rumination).

3.3.6. Obsessions—Obsessions are a defining component of Obsessive Compulsive Disorder and another form of repetitive thought. Obsessions are defined as, “persistent ideas, thoughts, impulses, or images that are experienced as intrusive and inappropriate and that cause marked anxiety or distress (American Psychiatric Association, 2000, pp. 457),” and are followed by some compensatory strategy to reduce the distress. Based on this definition, several distinctions from depressive rumination can be made: 1) rumination is typically conceptualized as occurring in response to negative affect, whereas, obsessions are believed to generate distress, and 2) depressive ruminations are associated with a lack of instrumental behavior, whereas obsessions are typically followed by some action designed to neutralize the obsession. Further, obsessions are hypothesized to be harmful because of their exaggeration of the significance of the obsessive thoughts (Wells, 1997), whereas depressive rumination is often conceptualized as harmful due to its interference with problem-solving. Finally, the content of the two thinking styles differ in that obsessions focus on six specific domains related to the likelihood of harm coming as a result of the belief, and the necessity of neutralizing the potential harm (OCCWG, 1997; see section on content of rumination for contrast). The two styles do converge in that a role for metacognitions is clearly articulated in theories of obsessions, and are also supported in depressive rumination.

3.3.7. Worry—Rumination has also been compared to worry, and in some models, is considered a type of worry (S-REF). Many researchers have noted the high comorbidity of GAD and depression; over 60% of clients who present with symptoms of GAD also qualify for a diagnosis of major depressive disorder (Brown, Campbell, Lehman, Grisham, & Mancill, 2001). This significant concurrence has inspired a growing literature on the overlap between rumination, which is often studied in the context of depression, and worry, which is often studied in the context of GAD. Measures of rumination and worry have also demonstrated high

correlations, above and beyond that of symptom measures of anxiety and depression ($r=.66$; Beck & Perkins, 2001). Rumination and worry overlap in their relationships to anxiety and depression, although some studies do indicate specificity of rumination to depression and worry to anxiety (Fresco et al., 2002; McLaughlin et al., 2007; Segerstrom, Tsao, Alden, & Craske, 2000). Rumination has been found to predict changes in both depression and anxiety symptoms (Nolen-Hoeksema, 2000) and individuals with major depression have been reported to engage in levels of worry similar to individuals with GAD (Starcevic, 1995). As a whole, these studies suggest that rumination and worry are related not only to each other, but also each is related to symptoms of both depression and anxiety.

Other studies have demonstrated that the content of worry and rumination are distinct; worry thoughts are often focused on problem-solving and have a future orientation, whereas ruminative thoughts concern themes of loss and are more focused on the past (Beck et al., 1987; Papageorgiou & Wells, 1999). Rumination, as compared to worry, has also been associated with less effort and less confidence in problem solving (Papageorgiou & Wells, 2004). It has also been suggested that rumination and worry serve different purposes, namely that rumination is associated with greater belief in the personal relevance of a situation and a larger need to understand it, whereas worry is associated with a desire to avoid worry thoughts (Watkins 2004b). Worry has also been hypothesized to contain more imagery than rumination; however, support for this has been mixed (McLaughlin et al., 2007; Papageorgiou & Wells, 1999; Watkins et al., 2005).

Overall, these studies suggest that worry and rumination are related constructs that may inform investigations of common mechanisms of harm in depression and anxiety. It is likely that rumination and worry, as with rumination and reflection, are related types of repetitive thinking that may be better captured as subtypes of some larger construct, such as avoidant coping strategies.

3.3.8. Emotion regulation and coping—Emotion regulation includes biological, social, and behavioral reactions to emotional content. Typically, coping may be conceptualized as a type of emotion regulation, one that is both conscious and voluntary (Garnefski et al., 2001). Coping, then, can further be classified in several ways, such as distinguishing between problem-focused and emotion-focused coping. Some theorists have argued that rumination may be one of many types of emotion-focused coping (Matheson & Anisman, 2003; Matthews & Wells, 2004; Segerstrom et al., 2003); however, others have suggested that rumination is different from emotion-focused coping in that emotion-focused coping captures many types of responses to negative events, whereas rumination is more specifically related to cognitive responses to negative mood (Lyubomirsky & Tkach, 2004). This does not, however, preclude the possibility that rumination is a subset of emotion-focused coping. In support of this, rumination, indexed as one of many coping strategies, was related to dysphoric symptoms and deterioration in mood over time (Matheson & Anisman, 2003). This lends support to thinking about rumination as an emotion-focused coping strategy that is part of an individual's emotion regulation repertoire.

Another way of dichotomizing coping is to separate voluntary from involuntary strategies. From this viewpoint, rumination is seen as a type of involuntary engagement response (Conner-Smith et al., 2000; Silk, Steinberg, & Morris, 2003). Within this conceptualization, rumination (as measured by the Responses to Stress Questionnaire) is less effective in regulating emotion than other strategies, and is related to increased internalizing symptoms (such as depression) and externalizing symptoms (such as problem behaviors; Conner-Smith et al., 2000; Silk et al., 2003). This is consistent with the idea that involuntary engagement strategies are more predictive than voluntary coping of internalizing and externalizing symptoms. One caveat to these findings is that rumination is just one of many involuntary engagement strategies, including intrusive thoughts, emotional arousal, physiological arousal, and impulsive action.

Therefore, it can be difficult to determine whether the relationship to depressive symptoms is related to rumination or to the other constructs captured under the rubric of involuntary engagement strategies. In addition, involuntary may imply that rumination is an unconscious process, and therefore, should not be considered “coping.” It remains unclear if rumination is best characterized as an automatic or consciously controlled process; however, the link between conscious metacognitive beliefs and rumination suggests a more conscious process.

A final way of categorizing coping strategies is to differentiate cognitive and behavioral attempts at emotion regulation. In this model, rumination consists of its own subscale among other cognitive emotion regulation strategies such as self-blame, other-blame, catastrophizing, etc. Rumination as measured by the CERQ has been related to depressive symptoms (Garnefski et al., 2001, Garnefski, Boon, & Kraij, 2003, Garnefski, Teerds, Kraij, Legerstee, & van den Kommer, 2004; Kraij, Pruyboom, & Garnefski, 2002). One advantage of this index of rumination is that it separates rumination from other, similar coping styles and thus isolates the effects of rumination. In sum, it is likely that rumination may be appropriately considered one of many forms of coping or cognitive emotion regulation.

3.3.9. Neuroticism—Rumination has been conceptualized as a cognitive and behavioral expression of trait neuroticism and evidence for a significant relationship between neuroticism and rumination has been garnered (Nolen-Hoeksema & Davis, 1999; Nolen-Hoeksema et al., 1994; Roberts et al., 1998; Trapnell & Campbell, 1999). In addition, rumination mediates the association between neuroticism and depression (Nolan, Roberts, & Gotlib, 1998; Roberts et al., 1998). However, rumination relates to depression even after controlling for neuroticism; therefore, rumination may be related to depression above and beyond its expression of neuroticism. How rumination relates to personality constructs has important implications for the stability of the construct, as well as potentially explaining the overlap between anxiety and depression and the lack of specificity of rumination.

3.3.10. Social and emotional competence and emotional intelligence—Social and emotional competence is an index of effective emotional functioning and includes components such as accurate perception of emotions, appropriate expression of emotions, successful emotion management, emotional awareness, and social problem solving (Ciarrochi, Scott, Deane, & Heaven, 2003). Many of these processes could potentially overlap with rumination, such as emotion management and perception of emotions, and rumination has been related to decrements in social problem solving in other studies (Lyubomirsky & Tkach, 2004). In support of this, rumination has been associated with ineffective problem orientation, difficulty expressing and identifying emotions, and lower emotional intelligence, which is defined as the ability to monitor, identify and regulate emotions (Ciarrochi et al., 2003; Salovey, Mayer, Goldman, Turvey, & Palfai, 1995). Again, this may help place rumination in the context of larger theories of emotion regulation.

4. Conclusions and future directions

As can be seen from this review, rumination is a multifaceted, multidimensional construct that has been studied in a variety of contexts and in relation to a variety of psychological and health outcomes. Although it is clear that rumination is important in the development of depression and anxiety, it can be difficult to determine how it is best characterized, best measured, and best used to predict certain outcomes. Therefore, as this construct becomes increasingly important in clinical research, indices and models of rumination should be thoughtfully selected and employed. Several dimensions were recommended for consideration by researchers aiming to examine rumination or related constructs, including the stability, content, triggering event, appropriate outcome variable, function of rumination, and relationship to other constructs of rumination, including thought processes that may be adaptive in processing emotion.

In addition, it was suggested that rumination is best characterized as a stable, negative, broadly construed way of responding to discrepancies between current status and target status. Specifically, rumination may be triggered by both the realization that one is not where one desires, and the negative affect that is likely to accompany that realization. Further, the content of rumination is likely to center on themes of discrepancies between actual and desired status. Finally, it is suggested that rumination may best be understood in the context of a larger theory; specifically, rumination is an emotion regulation strategy that is driven by positive metacognitive beliefs about its efficacy in remediating perceived discrepancies, but ruminative thinking serves to effectively avoid processing of negative emotion. Given that a broader conceptualization of rumination is proposed here, specificity to depression cannot be assumed, and it is suggested that multiple measures of outcome are appropriate.

Although the measures and models of rumination presented in this article differ in some critical ways, several themes did arise across theories. It is clear from many of the factor analyses and larger models of rumination that there are positive and negative forms of repetitive thought that are captured in many of the current measures of rumination. Therefore, factor analyses like that of Treynor et al. (2003) are critical in delineating which items of a measure capture maladaptive thought processes (such as rumination), and which are related to healthier forms of self-focus (such as reflection). This article proposes that rumination should be differentiated from reflection; however, future research must parcel out what distinguishes harmful from helpful repetitive thought. Watkins (2008) 3-dimensional approach to characterizing repetitive thought is an important first-step towards that goal.

Another similarity across models is the growing importance of metacognitive beliefs in the selection of rumination as an emotion regulation strategy. In the S-REF and Goal Progress models, an individual's beliefs about rumination are specifically related to the potential harm rumination can cause. Alternatively, other conceptualizations of rumination do not address metacognitions; however, they may capture metacognitive influences in their measures (e.g., Rumination on Sadness, Retrospective Intrusive Ruminations, Emotion Control Questionnaire). Given the evidence presented by Papageorgiou and Wells (2003) regarding their Metacognitive Model of Rumination, the role of beliefs should be considered when studying rumination.

Many of the models presented couch rumination in the context of other strategies of emotion management. To date, the most widely used measure of rumination (the RSQ) does not address rumination's relationship to larger models of emotion management. Future explorations of ruminative thinking may want to consider its relevance in relationship to other types of emotion regulation. For example, it may be that rumination is best characterized as an experiential avoidance coping strategy (Hayes et al., 1996). Thus, consideration of rumination's role in a larger context, such as experiential avoidance, will increase its usefulness and further examination of which context most accurately characterizes ruminative thought is necessary.

In addition, although models differed in their mechanism of harm for rumination, many believed that rumination impacted an individual's ability to employ more adaptive emotion regulation strategies in response to the trigger. For example, the RST proposes that rumination interferes with problem solving and instrumental behavior, as do the Rumination on Sadness, Goal Progress theory, and S-REF models. Given that rumination (as measured by the RSQ) has been related to decrements in problem-solving, this is likely an important link between theories of rumination and is compatible with an experiential avoidance view in that avoidance of emotional material will likely impede effective generation of solutions.

A question that remains is the extent to which rumination is best characterized as a depression specific concept or whether it is more usefully conceptualized as a general maladaptive thought

process that contributes to diverse mental and physical health outcomes. Given that many measures of rumination demonstrated little specificity, it is important for future researchers to consider the utility of this construct solely in relation to depression outcomes. Given the broader conceptualization of rumination advocated in this article, it is suggested that researchers design their studies with a greater array of potential outcomes, particularly indices of both depression and anxiety.

Although the models presented address several important dimensions of rumination, there are components that require further exploration, such as the extent to which rumination is assumed to be conscious or controlled vs. unconscious or automatic. This has not been explored well and may be important in determining how rumination is best studied. Specifically, the majority of rumination measures are self-report, and thus, rely heavily on peoples' awareness of their repetitive thought processes. If it is automatically driven, this may not be an appropriate way to assess ruminative thinking. In addition, this will help clarify whether or not rumination is accurately described as a conscious “coping” strategy, or if that label is inaccurate.

Another theme across measures of rumination was the lack of cognitive purity of the measures. Many of the models of rumination construe it as a cognitive process; however, the measures include aspects of metacognition, behavior, and motivation. If there are critical differences in the way these different aspects of emotion regulation strategies affect outcome, measures may be clouded by their multi-component items. Conversely, the consistent relationship of these measures to depression, anxiety, and other mental and physical health outcomes raises the question of whether rumination may be a more complex construct that includes motivation, behavioral tendencies, and metacognition. Regardless, researchers should consider the degree to which they want a purely cognitive measure of the construct, and the relationship between cognitive and behavioral components of rumination warrants further study.

In sum, this review highlights some of the important similarities and differences between the many models and conceptualizations of rumination in the literature. It is suggested here that consideration of rumination as a characteristic, experientially avoidant emotion regulation strategy that arises in response to perceived discrepancies between desired and actual status is most appropriate. As highlighted by Siegle et al. (2004), measures of rumination lack consistency across individuals and, therefore, likely capture different aspects of this broad construct. As rumination becomes an increasingly popular construct in the literature, it is imperative that future researchers select indices of rumination in light of their conceptual backgrounds, and clearly articulate their construal and corresponding measure of rumination. It is hoped that this review will aid in this endeavor.

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Table 1

Models of rumination

	Context	Conceptualization of Rumination	Measure(s)	Findings
Response Styles Theory Nolen-Hoeksema (1991)	Cognitive Vulnerability to Depression	Repetitively thinking about the causes, consequences, and symptoms of current negative affect.	Rumination subscale of the Response Style Questionnaire (Nolen-Hoeksema & Morrow, 1991) <ul style="list-style-type: none"> • High internal consistency ($\alpha=0.89$) • Test-retest reliability is moderate ($r=.47$ over 1 year) to high ($r=.80$ over 5 months) • Specificity to depression is assumed, but has not been adequately demonstrated. 	<ul style="list-style-type: none"> • Linked to longer and more severe depression, delayed recovery from depression, increases in suicidal ideation, impairments in problem solving, motivation and concentration (Eshun, 2000; Lyubomirsky & Tkach, 2003; Siegle, Sagrati, & Crawford, 1999; see Lyubomirsky et al., 2003, for a review) • Prospectively predicts depression (Nolen-Hoeksema, 2000; Spasojevic & Alloy, 2001). • Mediates the gender difference in depression (Butler & Nolen-Hoeksema, 1994; Nolen-Hoeksema et al., 1999) • Related to the development of anxiety and depression (Nolen-Hoeksema, 2000).
Rumination on Sadness Conway et al. (2000)	Cognitive Vulnerability to Depression	Repetitive thinking regarding present distress and the circumstances surrounding the sadness	Rumination on Sadness Scale (Conway et al., 2000) <ul style="list-style-type: none"> • Internal reliability was high ($\alpha=.91$) • 2–3 week test-retest reliability was adequate ($r=.70$). • Specificity to depression is assumed, but has not been 	<ul style="list-style-type: none"> • Related to scores on the Automatic Thoughts Questionnaire, likelihood of using imagery, self-disclosure, agreeableness, self-reflectiveness, low self-deception, neuroticism, and femininity

Context	Conceptualization of Rumination	Measure(s)	Findings
		adequately assessed	(Conway et al., 2000). <ul style="list-style-type: none"> Correlated with scores on the RRS and BDI (Conway et al., 2000). Predicted levels of distress after a sad mood induction (Conway et al., 2000).
Stress Reactive Rumination Alloy et al. (2000)	Cognitive Vulnerability to Depression	Rumination on negative inferences associated with stressful life events Stress Reactive Rumination Scale (Alloy et al., 2000) <ul style="list-style-type: none"> Internal consistency of the scale was adequate ($\alpha=.89$) Demonstrated 1-month test-retest reliability of .71. Specificity to depression is assumed, but has not been adequately assessed 	<ul style="list-style-type: none"> Moderated relationship of cognitive vulnerability to depression and onset, number, and duration of depressive episodes (Robinson & Alloy, 2003) Better predictor of depression than the RRS or private self-consciousness (Robinson & Alloy, 2003)
Post-Event Rumination Clark and Wells (1995)	Cognitive Models of Social Phobia	Continued processing of (a "postmortem"), or brooding about, a social interaction <ul style="list-style-type: none"> Post-Event Processing Questionnaire (Rachman et al., 2000; no psychometric data reported) Post-Event Processing Record (Lundh & Sperling, 2002; $\alpha=.85$ and .88) Rumination Questionnaire (Mellings & Alden, 2000; $\alpha=.70$) Thoughts Questionnaire (Edwards et al., 2003; $\alpha=.94$ for the negative scale, .79 for the positive, and .90 for the total) No specificity to depression assumed or demonstrated 	<ul style="list-style-type: none"> Prevalent in social phobia (in community and clinical samples) (Abbott & Rapee, 2004; Edwards et al., 2003; Harvey, Ehlers, & Clark, 2005; Lundh & Sperling, 2002; Mellings & Alden, 2000; Rachman et al., 2000). Post event ruminations are recurrent, intrusive, and disruptive to concentration (Rachman et al., 2000) Linked to avoidance of social situations and recall of negative self-related information (Mellings & Alden, 2000;

Context	Conceptualization of Rumination	Measure(s)	Findings
			<p>Rachman et al., 2000).</p> <ul style="list-style-type: none"> Decreases with treatment for social anxiety (Abbot & Rappe, 2004). Correlated to symptom indices of depression (Abbott & Rapee, 2004; Edwards et al., 2003; Rachman et al., 2000).
Goal-Progress Martin et al. (1993)	Self-Regulation	Repetitive thoughts about goal discrepancy	<p>Scott McIntosh Rumination Inventory (Scott & McIntosh, 1999)</p> <ul style="list-style-type: none"> Full scale α's ranged from .57-.60, and the subscales ranged from .66-.77 No specificity to depression has been demonstrated <ul style="list-style-type: none"> Participants success feedback related to speed of response to task related information (Martin et al., 1993) Increased focus on higher order vs. lower order goals in ruminative content (Martin et al., 1993) Rumination associated with more right hemisphere activity (Martin & Shira, 2002; Martin et al., 2004) Rumination mediates the link between goal attainment and happiness (McIntosh, Harlow, & Martin, 1995)
S-REF Wells and Matthews (1994, 1995)	Self-Regulation	A generic process in response to a discrepancy between actual and desired status, a subset of worry	<p>Rumination is multi-faceted in this model and thus several aspects must be measured. Potential measures include:</p> <ul style="list-style-type: none"> Anxious Thoughts Inventory (Wells, 1994; internal consistencies for the 3 scales are .84, .81, and .75 respectively, and the 5 week test-retest reliabilities <ul style="list-style-type: none"> Worry increases negative thinking after a stressful event (Matthews & Wells, 2004) Rumination related to biases in recollection of negative information about the self (Matthews & Wells, 2004) Individuals with depression have more

Context	Conceptualization of Rumination	Measure(s)	Findings
		<p>are .76, .84, and .77)</p> <ul style="list-style-type: none"> • Metacognitions Questionnaire (Cartwright-Hatton & Wells, 1997; good internal consistency, scale α's range from .72 – .89 and good test-retest reliability over 5 weeks, r's range from .84 – .94) • Thought Control Questionnaire (Wells & Davies, 1994; acceptable internal consistencies for all scales (α = .64–.71) • No specificity to depression assumed or demonstrated 	<p>positive beliefs about rumination's utility (Papageorgiou & Wells, 2001b)</p> <ul style="list-style-type: none"> • Rumination mediates the relationship between positive beliefs about rumination and depression (Papageorgiou & Wells, 2001b) • Individuals hold negative beliefs about rumination (Papageorgiou & Wells, 2001a)
Conceptual-evaluative & Experiential Watkins (2004a,b)	Self-focus, Teasdale's Interacting Cognitive Subsystems framework	Conceptual Evaluative Self-focus (analytical, evaluative, thinking about the self, focusing on discrepancies between current and desired outcomes)Experiential Self-focus (non-evaluative, intuitive, in the moment awareness of experience)	<p>Pre-Occupation Scale of the Action Control Scale (Kuhl, 1994)</p> <ul style="list-style-type: none"> • $\alpha > .70$ • Specificity to depression has not been adequately assessed <ul style="list-style-type: none"> • Rumination interacted with manipulated self-focus style (high ruminators in conceptual-evaluative condition reported more negative mood following upsetting event; Watkins, 2004a,b) • High ruminators in the experiential condition reported decrease in negative mood (Watkins, 2004a,b) • Conceptual-evaluative self-focus impacts several constructs related to depression (e.g. over-general memory, and social problem solving; Watkins & Baracaia, 2002; Watkins & Moulds, 2005;

Context	Conceptualization of Rumination	Measure(s)	Findings
Multi-dimensional Fritz (1999)	Trauma, health psychology 3 subtypes of rumination following trauma: (1) instrumental (2) emotion-focused and (3) searching for meaning,	Created his own measure (Fritz, 1999) <ul style="list-style-type: none">No psychometrics reportedNo specificity to depression assumed or demonstrated	Watkins & Teasdale, 2001) <ul style="list-style-type: none">Instrumental rumination associated with less mood disturbance at the time of discharge from the hospital, and over 4 month follow-up (Fritz, 1999)Instrumental rumination associated with better mental functioning at follow-up (Fritz, 1999)Emotion-focused rumination related to more mood disturbance at both time points, and worse mental functioning over the follow-up (Fritz, 1999)Searching for meaning not related to mood or functioning at Time 1, but predicted greater mood disturbance and worse mental functioning 4 months after discharge (Fritz, 1999)
Rumination & Self-Regulation Beckman & Kellman, 2004	Self-Regulation & stress Rumination is a volitional component that interferes with successful self-regulation in response to stress, and, in fact, can perpetuate stress.	Rumination subscale of the Volitional Components Questionnaire (VCQ; Kuhl & Fuhrmann, 1998). <ul style="list-style-type: none">$\alpha > .70$No specificity to depression assumed or demonstrated	<ul style="list-style-type: none">Procrastination, susceptibility to intrusions, alienation, rumination, passive avoidance and self-discipline related to higher self-reported stress (Beckman & Kellman, 2004).
Cognitive Emotion Regulation Questionnaire Garnefski et al. (2001)	Cognitive Emotion Regulation Rumination is one of many coping strategies used to regulate emotions that arise in response to stressors	36 items on 9 scales The rumination scale evidenced the highest internal consistency ($\alpha = .83$) and 5 month test-retest reliability of .63	<ul style="list-style-type: none">Clinical vs. non-clinical individuals differed on rumination scale scores. Difference disappeared

Context	Conceptualization of Rumination	Measure(s)	Findings
			<p>once education level, total number of life events, and the other cognitive emotion regulation strategies were covaried (Garnefski et al., 2002).</p> <ul style="list-style-type: none"> <li data-bbox="1209 499 1453 926">• Rumination linked to depressive symptoms among elderly participants (Kraaij, Pruyboom, & Garnefski, 2002), adolescents (Garnefski et al., 2003, Garnefski et al., 2001), and in a general population of adults (Garnefski et al., 2004). <li data-bbox="1209 940 1453 1077">• Women report higher levels of rumination than men (Garnefski et al., 2004).

Table 2

Other measures of rumination

Measure	Context	Conceptualization of Rumination	Total Items & Psychometric Properties	Findings
Responses to Stress Questionnaire Conner-Smith et al. (2000)	Emotion regulation	Rumination is one of many multidimensional responses to stress. Rumination is an involuntary engagement strategy and is not a coping style because it is not voluntary.	57 items that capture 19 aspects of coping responses <ul style="list-style-type: none"> 3-item rumination scale shows adequate internal consistencies (ranging from .69-.78) and 1-2 week test-retest reliability ($r=.76$). Specificity to depression not assumed or demonstrated 	<ul style="list-style-type: none"> Related to behavioral and emotional problems in youth (Conner-Smith et al., 2000). Related to higher levels of depressive symptoms in None adolescents, as well as externalizing behaviors, and poorer regulation of anger (Silk et al., 2003). Greater use of involuntary engagement strategies associated with more anxiety; this relationship was stronger for women (Wadsworth et al., 2004) Involuntary engagement strategies correlated with more depressive symptoms and trait anxiety (Luecken, Tartaro, & Appelhans, 2004).
Impact of Events Scale Horowitz et al. (1979)	Responses to traumatic events	Rumination is one of many potential responses to traumatic events, and is categorized as intrusive.	15 items that load on 2 scales <ul style="list-style-type: none"> Good internal consistency ($\alpha=.90$) Split-half reliability ($r=.86$) Specificity to depression not assumed or demonstrated 	<ul style="list-style-type: none"> IES related to trauma symptoms, ASD, PTSD, depressive symptoms, and other measures of depressive rumination (Friedberg et al., 2005; Siegle et al., 2004). Did not uniquely contribute to the prediction

Measure	Context	Conceptualization of Rumination	Total Items & Psychometric Properties	Findings
Response to Intrusions Questionnaire Clossy and Ehlers (1999)	Responses to traumatic events	Rumination is a meta-cognitive response to trauma-related intrusive thoughts.	Rumination subscale is 3 items <ul style="list-style-type: none"> Internal consistency for the scale is low (α's range from .39 to .59) Specificity to depression not assumed or demonstrated 	<p>of depressive symptoms in a factor analysis (Siegle et al., 2004).</p> <ul style="list-style-type: none"> Relationship between ruminative responses to trauma intrusions and PTSD symptoms (Clossy & Ehlers, 1999; Dunmore et al., 2001; Ehlers et al., 1998; Steil & Ehlers, 2000). Rumination in response to loss significantly associated with grief and depressive symptoms, and rumination and negative interpretations of grief reactions were the strongest predictors of symptom severity (Boelen, van den Bout, & van den Hout, 2003). 2 of the RIS rumination items were related to depressive symptoms, however, the item, "I dwell on them," was not (Starr & Moulds, 2006).
Retrospective Ruminations Questionnaire Luminet (2004)	Response to negative life event	Intrusiveness of thoughts is a dimension of ruminative thinking. Rumination occurs in response to both negative and positive events, and thus, is potentially adaptive facet of emotion processing	6 items on various dimensions <ul style="list-style-type: none"> Internal consistencies ranged from .75 to .84 Specificity to depression not assumed or demonstrated 	<ul style="list-style-type: none"> Rumination reported equally in response to negative and positive events, whereas intrusive thoughts were reported more in response to negative events

Measure	Context	Conceptualization of Rumination	Total Items & Psychometric Properties	Findings
				<p>(Luminet, Zech, Rime, & Wagner, 2000)</p> <ul style="list-style-type: none"> Intrusive ruminations have been related to the rumination subscale of the RSQ and were significantly correlated with depressive symptoms (Siegle et al., 2004). Not related to other indices of more anxiety related thought (such as the Emotion Control Questionnaire) (Luminet, 2004). No outcome measures were presented, thus, no way to determine how these measures relate to mental health status (Luminet et al., 2000; Luminet et al., 2004; Luminet, Rime, & Wagner, 2004).
Emotion Control Questionnaire Roger and Najarian (1989)	Personality, emotional intelligence, social and emotional competence	Rumination is a characteristic strategy that may be employed in response to stress or other negative experiences or emotions.	<p>56-item inventory that contains 4 scales</p> <ul style="list-style-type: none"> Internal consistencies of the rehearsal scale is good ($\alpha = .80$). Test-retest reliabilities over 7 weeks ranged from .73 to .92. Specificity to depression not assumed or demonstrated 	<ul style="list-style-type: none"> Related to other widely used measures of rumination (including the RSQ; Siegle et al., 2004). It has also been related to depressive symptoms (Lok & Bishop, 1999; Siegle et al., 2004), trait anxiety (Roger & Najarian, 1989), stress (Lok & Bishop, 1999), health complaints (Lok & Bishop, 1999), sustained heart

Measure	Context	Conceptualization of Rumination	Total Items & Psychometric Properties	Findings
				<p>rate during stress (Roger & Jamieson, 1988), and cortisol secretion during stress (Roger & Najarian, 1998).</p> <ul style="list-style-type: none"> In a factor analytic study, was a significant predictor of depression, stress, anxiety, and satisfaction with social support (Ciarrochi et al., 2003).