

Rumination

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Abstract

Rumination is repetitive thinking about personal and self-related concerns. Such rumination focused on symptoms and feelings has been implicated in the onset and maintenance of depression, through both experimental and longitudinal prospective studies, consistent with the Response Styles Theory. Rumination is also conceptualized within a control theory perspective, as an instrumental response to unresolved personal goals. Rumination acts to exacerbate existing mood states and elaborate pre-existing cognition—in this way, it can act as a vulnerability factor for psychopathology. However, there is emerging cutting edge evidence that rumination can also have adaptive consequences, when it either focuses on positive information or involves a processing mode that is more concrete, focused on the specific details and mechanics of situations. Rumination is also being proposed as a strong candidate for a transdiagnostic process that contributes to multiple emotional disorders. New approaches to the treatment of rumination have recently been developed with preliminary encouraging data, although further large-scale trials are required. Key issues for research into rumination going forward include more detailed unpacking of the underlying cognitive and attentional mechanisms determining individual differences in rumination and examining the contribution of rumination across physical and mental health.

INTRODUCTION

Rumination is repetitive, prolonged, and recurrent thinking about one's self, one's personal concerns, and one's experiences (Harvey, Watkins, Mansell, & Shafran, 2004; Watkins, 2008). It bridges many topics: social cognition, emotion, motivation, self-regulation, goal attainment, stress, psychopathology, and mental health. Moreover, it is a process commonly employed by all people.

Within clinical psychology, rumination has been principally conceptualized as a learnt response style characterized by repetitive thinking about the symptoms, meanings, and consequences of depressed mood (Nolen-Hoeksema, 1991), which is hypothesized to contribute to the onset and maintenance of depression. This Response Styles Theory explains increased vulnerability for depression, especially among women.

However, rumination has been conceptualized more broadly as recurrent instrumental thinking about an unresolved goal within a Control Theory account (Martin & Tesser, 1996). Such goal-discrepancy rumination can have constructive or unconstructive consequences, depending on whether it reduces the perceived discrepancy through active problem solving or passively makes the unattained goal more salient.

This essay summarizes findings from both approaches, identifies the most promising lines of inquiry to date, and identifies key issues that remain to be addressed.

FOUNDATIONAL RESEARCH

CONTROL THEORY

This account proposes that rumination is triggered by a perceived discrepancy between the current state and the desired goal, focuses on the unresolved goal, and persists until the unresolved goal is achieved or abandoned (Martin & Tesser, 1996). Consistent with this account, unresolved and blocked goals increase the priming and accessibility of goal-relevant information. Thoughts relating to unresolved goals persist longer than those associated with resolved goals (Zeigarnik, 1938). In naturalistic diary and experience sampling studies, unresolved personally important goals are associated with increased rumination (Moberly & Watkins, 2010; Gebhardt, Van der Doef, Massey, Verhoeven, & Verkuil, 2010).

NEGATIVE CONSEQUENCES OF RUMINATION

The main consequences of rumination are (i) exacerbation of existing emotional states such as sadness, anger, anxiety, and depression; (ii) elaborating and polarizing the thought content focused on during rumination (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008; Watkins, 2008). Rumination magnifies, prolongs, and exacerbates existing mood and elaborates associated mood-congruent cognition. Rumination causes this effect by (i) increasing self-focus and (ii) focusing attention on the discrepancy between the desired goal and the actual situation, making the unresolved discrepancy more salient. Experiments have used a standardized induction, in which participants concentrate on sentences that focus on themselves, their current feelings, and their causes and consequences (e.g., "Think about the way you feel inside"; Lyubomirsky & Nolen-Hoeksema, 1995). As a control condition, a distraction induction is typically used, in which participants concentrate on sentences that involve imagining visual scenes unrelated to the self or to feelings (e.g., "Think about a fire darting round a log in a fire place").

Compared to distraction, rumination is reliably found to exacerbate existing negative affect and increase existing negative cognition, although these differential effects are only found when participants are already in a negative rather than a neutral mood (e.g., in depressed patients; after a sad mood induction). For sad or depressed participants, compared to distraction, rumination exacerbates negative mood, increases negative thinking about the self, past, and the future, impairs concentration and central executive functioning, and impairs social problem solving (e.g., Lyubomirsky & Nolen-Hoeksema, 1995; Watkins & Brown, 2002). Magnifying effects of rumination have also been found for anxiety and anger.

RESPONSE STYLES THEORY AND DEPRESSION

Consistent with Response Styles Theory (Nolen-Hoeksema, 1991), self-reported rumination prospectively predicts the onset of major depressive episodes, depressive symptoms in nondepressed and currently depressed individuals, and mediates the effects of other risk factors on depression in large-scale longitudinal studies (e.g., Nolen-Hoeksema, 2000; Spasojevic & Alloy, 2001; see meta-analysis by Mor & Winquist, 2002). Rumination is elevated in women compared to men and partially explains the 2:1 female:male ratio of depression. The convergence of this longitudinal data with the experimental evidence earlier suggests that rumination is a key pathological process in the onset and maintenance of depression. Within rumination, the brooding subtype, characterized by abstract, evaluative, judgmental, and self-critical thinking about problems and difficulties is implicated as most pathological.

CUTTING-EDGE RESEARCH

POSITIVE CONSEQUENCES

There is growing recognition that rumination can be adaptive and constructive as well as maladaptive and unconstructive. There is evidence that rumination is associated with (i) successful cognitive processing and recovery from upsetting and traumatic events, (ii) adaptive preparation and planning for the future, (iii) recovery from depression, and (iv) uptake of health-promoting behaviors (Watkins, 2008). These findings are consistent with the Control Theory prediction that rumination can be an instrumental functional process.

One factor influencing the consequences of rumination is the valence of ruminative thought: thinking about positive information typically results in adaptive consequences relative to focus on negative information, for example, finding benefits when thinking about a difficult situation (Watkins, 2008).

PROCESSING MODE

Another relevant factor is whether a more abstract or more concrete processing mode is adopted (Watkins, 2008). An abstract processing mode involves focusing on general, superordinate, and decontextualized mental representations that convey the essential meaning, causes, and implications of goals and events, including the “*why*” aspects of an action and the ends consequential to it. Such abstract thinking is characteristic of the phenomenology of depressive rumination. In contrast, a concrete processing mode involves a focus on the direct, specific, and contextualized experience of an event and on the details of goals, events, and actions that denote the feasibility, mechanics, and means of “*how*” to do the action.

The processing mode theory proposes that the consequences of abstract versus concrete processing are determined by their relative sensitivity to contextual and situational detail. Relative to a concrete mode, an abstract mode (i) insulates an individual from the specific context, (ii) makes the individual less distractible, less impulsive, (iii) enables more consistency and stability of goal pursuit across time, and (iv) allows gainful and unhelpful generalizations and inferences across different situations. However, it also (i) makes the individual less responsive to the environment and to any situational change and (ii) provides fewer specific and contextual guides to action and problem solving because of its distance from the mechanics of action (Watkins, 2011). When faced with difficulties and negative events, concrete processing will be adaptive relative to abstract processing because it will result in (i) improved self-regulation focused on the immediate demands of the situation rather than its evaluative implications; (ii) reduced negative overgeneralizations to emotional events, which contribute to increased emotional reactivity and vulnerability to depression; and (iii) more effective problem solving.

Consistent with this theory, experimental studies have robustly found abstract rumination causes negative consequences relative to concrete rumination. The standardized rumination induction was adapted into two variants that each retained the key original element of focus on self and mood, but with distinct instructions to induce concrete (*focus attention on the experience of*) versus abstract (*think about the causes, meanings, and consequences of*) processing. In depressed patients, compared to abstract rumination, concrete rumination reduced negative global self-judgments (Rimes & Watkins, 2005), increased specificity of autobiographical memory recall (Watkins & Teasdale, 2001), and improved social problem solving (Watkins & Moulds, 2005). Providing a conceptual replication to this finding, prompting abstract rumination (questions such as “Why did this problem happen?”) impaired social problem solving in a recovered depressed group, who performed as well as never-depressed participants in a no-prompt control condition,

whereas prompting concrete rumination (“How are you deciding what to do next?”) ameliorated the problem-solving deficit found in currently depressed patients (Watkins & Baracaia, 2002). Finally, repeated training to think in a concrete mode reduced subsequent emotional reactivity to analog loss and trauma events, relevant to training in an abstract mode (Watkins, Moberly, & Moulds, 2008).

RUMINATION AS A TRANSDIAGNOSTIC PROCESS

Rumination has been proposed as a transdiagnostic process, that is, a process present across multiple psychiatric diagnoses and that causally contributes to those disorders, rather than only being implicated in depression (Ehring & Watkins, 2008; Harvey *et al.*, 2004; Nolen-Hoeksema & Watkins, 2011). Rumination prospectively predicts symptoms of anxiety and anxiety disorders (e.g. post-traumatic stress) after controlling for baseline anxiety in numerous longitudinal studies (Watkins, 2008). Rumination prospectively predicts substance abuse, alcohol abuse, and eating disorders, after controlling for initial symptoms (Ehring & Watkins, 2008; Nolen-Hoeksema & Watkins, 2011). A recent meta-analysis found that rumination was significantly related to four distinct symptom types (depression, anxiety, eating, and alcohol abuse; Aldao, Nolen-Hoeksema, & Schweizer, 2010). Two large-scale longitudinal studies found that rumination explained the concurrent and prospective associations between anxiety and depression (McLaughlin & Nolen-Hoeksema, 2011).

TREATMENT INNOVATION

Because rumination has been identified as an important pathological process across multiple disorders, treatments that explicitly target rumination are a priority. However, to date, little data has been collected on the effects of cognitive behavioural therapy (CBT) or medication on rumination.

One recent treatment designed to explicitly target rumination is Rumination-focused Cognitive Behavioral Therapy (RFCBT; Watkins *et al.*, 2007, 2011). RFCBT is a manualized treatment, theoretically informed by processing mode and functional approaches to rumination, in which patients are coached to shift from unconstructive rumination to constructive rumination and to reduce avoidant behavior, through the use of functional analysis, experiential/imagery exercises, and behavioral experiments. Patients also use directed imagery to recreate previous mental states when a more helpful thinking style was active, such as memories of being completely absorbed in an activity (e.g., “flow” experiences) and experiences of increased compassion, which act directly counter to rumination. RFCBT

significantly reduced rumination and depression in a multiple baseline case series of patients with residual depression (Watkins *et al.*, 2007) and significantly outperformed continuation antidepressants in reducing rumination and depression in a Phase II randomized controlled trial (Watkins *et al.*, 2011).

Consistent with a causal relationship between processing mode and rumination, a proof-of-principle randomized controlled trial found that training depressed individuals to be more concrete when faced with difficulties reduced depression, anxiety, and rumination relative to a no-treatment control (Watkins, Baeyens, & Read, 2009). The training involved repeated practice at asking “How?” and focusing on specific details when thinking about recent difficulties. In a Phase II randomized controlled trial, guided self-help concreteness training was superior to treatment-as-usual in reducing rumination and depression in patients with major depression recruited in primary care (Watkins *et al.*, 2012).

KEY ISSUES FOR FUTURE RESEARCH

MECHANISMS UNDERPINNING RUMINATION

Despite well-developed theory and evidence regarding the consequences of rumination, knowledge about its underlying mechanisms is less developed. We do not know why some individuals engage in rumination more than others. The critical question of “What makes it so difficult to break free of rumination once it has begun?” (Nolen-Hoeksema *et al.*, 2008, p. 418) remains unanswered. Future research needs to delineate the mechanisms underpinning rumination.

Joormann (2010) proposed that rumination increases in those individuals who are unable to inhibit now irrelevant but previously relevant information in working memory. Consistent with this account, poor inhibitory control indexed on different experimental tasks is correlated with rumination (e.g., Gotlib & Joormann, 2010; Joormann, Yoon, & Zetsche, 2007). Similarly, Koster, De Lissnyder, Derakshan, and De Raedt (2011) proposed that individual differences in rumination arise from impairments in disengaging attention from negative self-referent information. Consistent with this account, self-reported rumination is correlated with selective attentional bias toward sad faces (Joormann, Dkane, & Gotlib, 2006) and toward negative words on the dot probe task (Donaldson, Lam, & Mathews, 2007). Key next steps include (i) delineating whether rumination is associated with biases in engaging and/or disengaging attention from negative information; (ii) determining the causal direction of the relationship between these deficits and the tendency toward rumination. If these biases and/or deficits

cause rumination, then manipulating them (e.g., through cognitive bias modification) should reduce rumination.

RUMINATION CO-MORBID WITH POOR PHYSICAL HEALTH

There is growing interest in rumination as a mechanism linking mental and physical illness, accounting for their high co-morbidity (e.g., between depression and cardiovascular disease). We coined the term “*Worried Unwell*” to reflect individuals with chronic health conditions (e.g., cardiovascular disease, obesity, and chronic pain) who ruminate about the symptoms and consequences of their ill-health. Such rumination may then contribute to the maintenance of physical health symptoms and exacerbate depression and anxiety.

Brosschot, Gerin, and Thayer (2006) noted that rumination involves the repeated or chronic activation of the cognitive representation of psychological stressors, which is hypothesized to prolong psychological and physiological responses to life events and daily stressors, resulting in body systems associated with stress (e.g., cardiovascular, hypothalamic pituitary adrenal, and immune systems) becoming chronically activated, and leading to the development of disease. Consistent with this hypothesis, rumination is elevated in patients with chronic illness and associated with dysregulated physiological function (e.g., reduced heart rate variability, increased heart rate, and increased blood pressure, all risk factors for hypertension and cardiovascular disorders). Rumination prospectively predicts negative health outcomes (Watkins, 2008), including increased heart disease over a 20-year follow-up (Kubzansky *et al.*, 1997) and increased depression in patients with acute coronary syndrome (Denton, Rieckmann, Davidson & Chaplin, 2012). Experimental induction of rumination about an upsetting or angry event results in increased blood pressure and heart rate that maintains over the next day (Ottaviani, Shapiro, & Fitzgerald, 2011).

However, experimental research has tended to be in healthy populations, while most patient studies are cross sectional. Experimental and prospective studies are necessary to unpack whether rumination causally influences symptoms in chronic illness and to determine its relative influence against other vulnerabilities.

METHODOLOGICAL ADVANCES

Self-report remains central to the study of rumination because it is essentially an experience of subjective consciousness. Nonetheless, development of well-validated implicit, behavioral, and neuroimaging indices (e.g., attentional probe tasks and eye tracking), which provide analog proxies highly

correlated with rumination, will enable us to overcome the limitations of self-report and enable fine-tuned investigation of underlying cognitive mechanisms.

To date, most rumination manipulations ask participants to voluntarily and deliberately ruminate, introducing potential demand effects. Further, this approach is not ecologically valid because rumination is typically experienced as passive, involuntary, and uncontrollable. New induction methods are required that indirectly engage involuntary rumination such as prompting personally important unresolved goals or training an abstract processing mode before failure feedback.

CONCLUSION

Rumination is a universal cognitive process triggered in response to poor progress on personally relevant goals. Rumination tends to amplify existing affect and elaborate mood-congruent cognitions. As such, it is implicated in the onset and maintenance of depression, anxiety, emotional disorders, and potentially chronic illness. Nonetheless, rumination can be adaptive when it is focused on positive content or when it involves concrete processing.

DEDICATION

This essay is dedicated to the memory of Susan Nolen-Hoeksema (1960–2013), following her premature death. Susan single-handedly initiated the clinical study of rumination and inspired us all through her rigor, clarity, and humanity. She will be much missed.

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