



Distinguishing rumination from worry in clinical insomnia[☆]

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ABSTRACT

Research has found that repetitive thought processes, such as worry and rumination, play an important role in several disorders; however, these cognitive processes have not yet been examined in insomnia. This study explores rumination and worry in insomnia by examining: 1) whether those high and low on rumination and worry differ on subjective sleep measures, and 2) whether rumination and worry are distinct processes in insomnia. Participants ($N = 242$) were diagnosed with an insomnia disorder by sleep experts. Participants completed measures of worry and rumination and maintained a 2-week daily sleep log. Results of a multivariate analysis of variance found no main effect of worry; although high and low ruminators differed on several sleep log indices, including sleep efficiency, wakefulness after sleep onset and sleep quality. Factor analysis supported the idea that rumination and worry are separate constructs. Whereas previous research has focused on worry in insomnia, these findings suggest that rumination is important for understanding sleep disturbance. Further, although rumination and worry are both repetitive thought processes, these results indicate that they are distinct processes within insomnia and should be treated as such. The results are discussed with respect to treatment implications for Cognitive Behavioural Therapy for Insomnia.

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“Worrying” about rumination in clinical insomnia

Repetitive thought is an important perpetuating risk factor in psychological models (Segerstrom, Tsao, Alden, & Craske, 2000; Watkins & Teasdale, 2004) that pervades across many disorders (Harvey, Watkins, Mansell, & Shafran, 2004). Much of the repetitive thought literature has focused on depression, anxiety, anger, and general health conditions (Watkins, 2008), but repetitive thought in insomnia is an area that requires further examination. Research suggests that cognitive processes, particularly the phenomena of not being able shut-off or control thoughts (Lichstein & Rosenthal, 1980) as an important maintaining factor in insomnia (Espie, Inglis, Tessier, & Harvey, 2001; Harvey, 2002; Lundh & Broman, 2000). Most models of insomnia acknowledge the role of repetitive thinking throughout the 24-h period in sleep difficulties, although the importance of such thinking in the perpetuation of insomnia varies from model to model (Harvey, 2002). In Harvey's model (2002) negatively-valenced mental activity usually focuses on concerns about not getting enough sleep and whether it will be

possible to function adequately during the day while suffering from daytime symptoms of insomnia, such as fatigue, disturbed mood, or concentration difficulties (Harvey, 2002). Such repetitive thought purportedly fuels further emotional arousal and this cycle perpetuates chronic insomnia. Both rumination (Carney, Edinger, Meyer, Lindman, & Istre, 2006; Thomsen, Mehlsen, Christensen, & Zachariae, 2003) and worry have purported roles in this cycle (Harvey, 2002) but there have been few empirical attempts to clarify how these roles are similar or different.

It has been suggested that even though both rumination and worry may involve a repetitive thought process (Segerstrom et al., 2000; Watkins & Teasdale, 2004), the cognitive content of rumination is on making attributions for disturbed mood and symptoms such as fatigue or concentration difficulties (Nolen-Hoeksema, 1991), whereas worry may be more focused on future, negative consequences of the current mood state (Borkovec, Ray, & Stöber, 1998). In insomnia, we might expect ruminative content to focus on “why” they are feeling fatigued during the day, and look to the past to explain the fatigue (i.e., they would attribute their low mood during the day to the previous night's sleep). However, an individual who is experiencing worry might focus on how their current mood state (e.g., anxiety) might prohibit (future) good sleep later that night, which could lead to (future) fatigue that would interfere with (future) functioning. In both instances, these thoughts could

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perpetuate the associated negative mood states of dysphoria and anxiety respectively and fuel further repetitive thinking; thus increasing arousal and either extending wakefulness (e.g., [Perlis et al., 1997](#)) or interfering with sleep (e.g., [Lundh & Broman, 2000](#)). [Watkins and Teasdale \(2004\)](#) and [Watkins, Moulds, & Mackintosh \(2005\)](#) have highlighted the role of these repetitive thought processes across various disorders; however, insomnia has not been included in this discussion. Although the role of worry has been explored in some depth in the insomnia literature ([Borkovec, Ray, & Stöber, 1998](#); [Hall, Buysse, Reynolds, Kupfer, & Baum, 1996](#); [Gross & Borkovec, 1982](#); [Kales, Caldwell, Soldatos, Bixler, & Kales, 1983](#); [Kales et al., 1984](#); [Watts, Coyle, & East, 1994](#)), rumination has not received the same degree of attention with respect to its role in sleep disturbance. Further compounding this discussion is the tendency for the insomnia literature to group the two processes together, even labelling them “ruminative worry” ([Espie & Lindsay, 1987](#)). Although worry-specific measures (e.g., [Harvey and Greenall, 2003](#)) have been used there are no validated rumination-specific measures used in insomnia. If they are indeed similar processes but with different content, it is possible that differing treatment strategies might be needed for each. Despite the paucity of research, some studies have demonstrated the importance of rumination in sleep quality. In one such study, [Thomsen et al. \(2003\)](#) investigated the relationship between rumination, negative mood and sleep quality in a healthy, analog sample. The authors found a significant association between rumination and subjective sleep quality, suggesting that rumination, like worry, influences sleep quality in poor sleepers.

In another analog investigation, [Carney, Edinger, Meyer, Lindman, and Istre \(2006\)](#) used the Symptom-Focused Rumination Subscale ([Bagby, Rector, Bacchioni, & McBride, 2004](#)) from a validated rumination measure, the Response Styles Questionnaire ([Nolen-Hoeksema & Morrow, 1991](#)) to examine whether good and poor sleepers differ in their tendencies to ruminate on symptoms such as fatigue, disrupted mood, and concentration difficulties. The items on this scale not only describe rumination about depression symptoms, they also describe rumination about common symptoms found in insomnia. Poor sleepers appear to respond to disruptions in their mood by thinking repetitively about the cause of their fatigue, achiness, and concentration difficulties ([Carney et al., 2006](#)). Other studies have supported that there is substantial overlap between depression and the symptoms of insomnia, most notably, nocturnal sleep disturbances, irritability, decreased concentration, and fatigue ([Carney, Ulmer, Edinger, Krystal, & Knauss, 2008](#)). [Carney and colleagues \(2006\)](#) found that after controlling for depression symptoms, rumination was not characteristic of good sleepers but the type of rumination mentioned was prevalent in poor sleepers. In addition to these important findings, this study demonstrates the utility of the Symptom-Focused Rumination Scale in sleep research.

The aforementioned study findings and rumination's purported role in cognitive theory ([Harvey, 2002](#)) suggest that rumination deserves further research exploration. Given that the two main studies have been conducted in non-clinical samples, these findings need to be extended to clinical samples of insomnia. The present study does so by investigating whether rumination, in addition to worry, relates to subjective sleep indices among individuals with clinical insomnia. In addition it is important to consider whether rumination plays a significant and independent role in the maintenance of insomnia. Given the differences between the two constructs with respect to their cognitive content, rumination and worry may be distinct and have independent or dynamic effects on individuals with insomnia.

The present study used a well-characterized clinical insomnia population to examine the relation between rumination and worry

in insomnia. This study extends previous analog investigations ([Carney et al., 2006](#); [Carney & Waters, 2006](#); [Thomsen et al., 2003](#)) by examining a clinical sample of those with insomnia, and comparing the relation of worry and rumination to sleep variables. Specifically, our first goal was to examine whether those high and low on rumination, in addition to worry, differ on sleep indices. To this end, we controlled for anxiety and depression by entering them as factors, which are associated with the mood states of worry and rumination respectively. By controlling for levels of these mood states, we could maintain good generalizability by including those with comorbid psychiatric conditions. Our first hypothesis was that individuals with insomnia who are high on rumination, compared to those low on rumination, will have significantly lower sleep efficiency and sleep quality, and significantly greater sleep onset latency and wakefulness after sleep onset. The second aim of our study was to determine whether rumination and worry are distinct constructs. We factor analyzed the Symptom-Focused Rumination Scale (SYM) and the Penn State Worry Questionnaire (PSWQ), which are validated measures of rumination and worry respectively. Our second hypothesis was that the items on the SYM and PSWQ will comprise separate independent factors.

Method

Participants

Participants included a combination of clinical-referred outpatients interested in insomnia treatment and volunteers for an insomnia study being conducted at two collaborating medical centers with sleep medicine specialty programs (Duke University Medical Center, Durham, NC & Rush Medical Center, Chicago, IL). The study was conducted in the insomnia specialty clinics at both sites. These clinics include physicians and psychologists, who specialize in sleep medicine. Participants included self-referred individuals seeking treatment, and research volunteers recruited via advertisements. Those participants who were eligible were recruited into a larger insomnia National Institute of Mental Health funded diagnostic insomnia parent study ($N = 242$). To meet eligibility, participants were: 1) over the age of 18 years, 2) fluent in the English language, 3) mentally competent to provide informed consent, 4) no self-reported acute psychiatric or medical conditions, 5) not a current inpatient, 6) no sign of significant cognitive impairment (i.e., have a Mini Mental Status Exam score > 24), and 7) not previously evaluated by any of the 6 diagnostic study clinicians at the recruitment site. Those with clinically significant sleep apnea were excluded using the following criteria: 1) Apnea/Hypopnea Index (AHI) > 15 on overnight polysomnography (PSG), or AHI > 5 with an Epworth Sleepiness Scale score > 10 . As a result, 29 participants were excluded. Similarly, to exclude those with Periodic Limb Movement (PLM) Disorder, those individuals with a PLM arousal index > 5 on PSG were also excluded, which resulted in 3 exclusions. Participants with a primary diagnosis of Restless Leg Syndrome or a Circadian Disorder were excluded; no participants fit these criteria. The final sample included 210 participants with insomnia ranging in age from 18 to 83 ($M = 48$, $SD = 15$), and, as is common in insomnia samples, about two thirds (67%) were female. The largest racial/ethnic group was Caucasian (58%), followed by African American (35%). [Table 1](#) provides demographic information for the sample.

Measures

Once enrolled, participants completed several questionnaires including the measures listed below. In addition, study participants completed a 10-page self-report sleep history questionnaire. This

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