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Rumination as a transdiagnostic factor in depression and anxiety

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ABSTRACT

The high rate of comorbidity among mental disorders has driven a search for factors associated with the development of multiple types of psychopathology, referred to as transdiagnostic factors. Rumination is involved in the etiology and maintenance of major depression, and recent evidence implicates rumination in the development of anxiety. The extent to which rumination is a transdiagnostic factor that accounts for the co-occurrence of symptoms of depression and anxiety, however, has not previously been examined. We investigated whether rumination explained the concurrent and prospective associations between symptoms of depression and anxiety in two longitudinal studies: one of adolescents ($N = 1065$) and one of adults ($N = 1317$). Rumination was a full mediator of the concurrent association between symptoms of depression and anxiety in adolescents ($z = 6.7$, $p < .001$) and was a partial mediator of this association in adults ($z = 5.6$, $p < .001$). In prospective analyses in the adolescent sample, baseline depressive symptoms predicted increases in anxiety, and rumination fully mediated this association ($z = 5.26$, $p < .001$). In adults, baseline depression predicted increases in anxiety and baseline anxiety predicted increases in depression; rumination fully mediated both of these associations ($z = 2.35$, $p = .019$ and $z = 5.10$, $p < .001$, respectively). These findings highlight the importance of targeting rumination in transdiagnostic treatment approaches for emotional disorders.

Introduction

The high degree of comorbidity between certain mental disorders, particularly depression and anxiety disorders (Brown, Cambell, Lehman, Grisham, & Mancill, 2001), has led to a search for mechanisms responsible for this comorbidity, often referred to as transdiagnostic factors (Ehring & Watkins, 2008; Harvey, Watkins, Mansell, & Shafran, 2004; Mansell, Harvey, Watkins, & Shafran, 2008; Norton, Hayes, & Springer, 2008). Many transdiagnostic factors have been proposed to link depression and anxiety, including elements of affect, attention, memory, reasoning, thought, and behavior (Ehring & Watkins, 2008; Harvey et al., 2004; Mansell et al., 2008; Moses & Barlow, 2006; Norton et al., 2008; Watson & Clark, 1984). Recently, repetitive negative thinking has been suggested to be an important transdiagnostic factor (Ehring & Watkins, 2008; Harvey et al., 2004; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008; Watkins, 2008). As Ehring and Watkins (2008) note, several disorder-specific definitions of maladaptive repetitive negative thinking exist, but all describe this process as (a) repetitive thoughts that are (b) passive and/or relatively uncontrolled, and (c) focused on negative content.

The specific type of repetitive negative thinking most frequently examined across a range of disorders, especially depression and anxiety disorders, is *rumination*. Nolen-Hoeksema defines rumination as a pattern of responding to distress in which an individual passively and perseveratively thinks about his or her upsetting symptoms and the causes and consequences of those symptoms, while failing to initiate the active problem solving that might alter the cause of that distress (Nolen-Hoeksema and Morrow, 1991). Experimental studies show that inducing this type of rumination in the context of distress leads to increases in both depressed and anxious mood (Blagden & Craske, 1996; McLaughlin, Borkovec, & Sibrava, 2007). Studies using questionnaire measures of rumination such as the Ruminative Responses Scale (Treynor, Gonzalez, & Nolen-Hoeksema, 2003) show that rumination predicts the later development of depressive symptoms (Broderick & Korteland, 2004; Nolen-Hoeksema, Morrow, & Fredrickson, 1993; Nolen-Hoeksema, Parker, & Larson, 1994; Nolen-Hoeksema, Stice, Wade, & Bohon, 2007; Schwartz & Koenig, 1996) as well as the future onset, number and duration of major depressive episodes (Just & Alloy, 1997; Nolen-Hoeksema, 2000; Nolen-Hoeksema et al., 2007; Robinson & Alloy, 2008). The tendency to ruminate also has been associated with

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self-reported symptoms of generalized anxiety (Fresco, Frankel, Mennin, Turk, & Heimberg, 2002; Harrington & Blankenship, 2002), post-traumatic stress (Clohessy & Ehlers, 1999; Mayou, Ehlers, & Bryant, 2002; Nolen-Hoeksema & Morrow, 1991), and social anxiety (Mellings & Alden, 2000).

Rumination may lead to both anxiety and depression through a variety of mechanisms. Experimental induction of rumination in distressed individuals leads to more maladaptive, negative thinking (Lyubomirsky, Caldwell, & Nolen-Hoeksema, 1998), less effective generation of solutions to problems (Donaldson & Lam, 2004; Lyubomirsky & Nolen-Hoeksema, 1995; Watkins & Baracaia, 2002; Watkins & Moulds, 2005), uncertainty and immobilization in the implementation of solutions to problems (Lyubomirsky, Kasri, Chang, & Chung, 2006; Ward, Lyubomirsky, Sousa, & Nolen-Hoeksema, 2003), and less willingness to engage in distracting, mood-lifting activities (Lyubomirsky & Nolen-Hoeksema, 1993). Survey and observational studies also show that people who ruminate experience less social support and more social friction (Nolen-Hoeksema & Davis, 1999), and are viewed less favorably by others (Schwartz & McCombs, 1995).

Although multiple studies have examined the relationships between rumination and symptoms of anxiety and depression in the same sample (Fresco et al., 2002; McLaughlin et al., 2007; Nolen-Hoeksema, 2000; Segerstrom, Tsao, Alden, & Craske, 2000), none of these studies has examined whether rumination *accounts for* the relationship between anxiety and depression in a sample. If rumination is indeed a transdiagnostic factor that leads to both depression and anxiety, we would expect that rumination is responsible, at least in part, for the comorbidity between symptoms of depression and anxiety and would account for their co-occurrence to a significant degree.

In the study reported here, we tested the prediction that rumination would statistically account for the relationship between symptoms of anxiety and depression both cross-sectionally and longitudinally. We tested this prediction in two samples, one comprised of early adolescents aged 11–14 years and the other comprised of adults ranging in age from 25 to 75 years. If rumination is truly a transdiagnostic factor in the co-occurrence of anxiety and depressive symptomatology, we expect to find evidence for its role in the overlap of such symptoms at a single point in time, across time, and in individuals at different points in the life course.

Methods

Data for the current study were drawn from two separate longitudinal samples: a school sample of early adolescents and a community sample of adults. The adolescent sample description, measures, and procedure are described first, followed by those for the adult sample.

Adolescent participants

The adolescent sample was recruited from the total enrollment of two middle schools (Grades 6–8) in central Connecticut that agreed to participate in the study, excluding students in self-contained special education classrooms and technical programs who did not attend school for the majority of the day. The schools were located in a small urban community (metropolitan population of 71,538). Schools were selected for the study based on demographic characteristics of the school district and their willingness to participate.

The parents of all eligible children ($N = 1567$) in the participating middle schools were asked to provide active consent for their children to participate in the study. Parents who did not return written consent forms to the school were contacted by telephone. Twenty-two percent of parents did not return consent forms and could not be reached to obtain consent, and 6% of parents declined to provide consent. Adolescent participations provided written assent. The overall participation rate in the study at baseline was 72%.

The baseline sample included 51.2% ($N = 545$) boys and 48.8% ($N = 520$) girls. Participants were evenly distributed across grade level. The race/ethnicity composition of the sample was as follows: 13.2% ($N = 141$) non-Hispanic White, 11.8% ($N = 126$) non-Hispanic Black, 56.9% ($N = 610$) Hispanic/Latino, 2.2% ($N = 24$) Asian/Pacific Islander, .2% ($N = 2$) Native American, .8% ($N = 9$) Middle Eastern, 9.3% ($N = 100$) Biracial/Multiracial and 4.2% ($N = 45$) Other racial/ethnic groups. Twenty-seven percent ($N = 293$) of participants reported living in single-parent households. The participating middle schools reside in a predominantly lower SES community, with a per capita income of $18,404 (Connecticut State Department of Education, 2006 based on data from 2001). School records indicated that 62.3% of students qualified for free or reduced lunch in the 2004–2005 school year. There were no differences across the two schools in demographic variables.

Two additional assessments took place after the baseline assessment. Of the participants who were present at baseline, 221 (20.8%) did not participate at the Time 2 assessment, and 217 (20.4%) did not participate at the Time 3 assessment, largely due to transient student enrollment in the district. Over the 4-year period from 2000 to 2004, 22.7% of students had left the school district (Connecticut Department of Education, 2006). Analyses were conducted using the sample of 1065 participants who were present at the baseline assessment, excluding participants who were present at Time 2 and/or Time 3 but not at Time 1. Participants who completed the baseline but not both follow-up assessments were more likely to be female, $\chi^2(1) = 6.85$, $p < .01$, but did not differ in grade level, race/ethnicity, or being from a single-parent household (p-values $> .10$). Participants who did not complete at least one of the follow-up assessments did not differ from participants who completed all three assessments on baseline depression or anxiety symptoms, or rumination (all p-values $> .10$).

Adolescent measures

Depressive symptoms

The Children's Depression Inventory (CDI; Kovacs, 1992) is a widely used self-report measure of depressive symptoms in children and adolescents. The CDI includes 27 items consisting of three statements (e.g., I am sad once in a while, I am sad many times, I am sad all the time) representing different levels of severity of a specific symptom of depression. The CDI has sound psychometric properties, including internal consistency, test-retest reliability, and discriminant validity (Kovacs, 1992; Reynolds, 1994). The item pertaining to suicidal ideation was removed from the measure at the request of school officials and the human subjects committee. The 26 remaining items were summed to create a total score ranging from 0 to 52. The CDI demonstrated good reliability in this sample ($\alpha = .82$).

Anxiety Symptoms

The Multidimensional Anxiety Scale for Children (MASC; March, Parker, Sullivan, Stallings, & Conners, 1997) is a 39-item widely used measure of anxiety in children. The MASC assesses physical symptoms of anxiety, harm avoidance, social anxiety, and separation anxiety and is appropriate for children ages 8 to 19. Each item presents a symptom of anxiety, and participants indicate how true each item is for them on a four-point Likert scale ranging from never true (0) to very true (3). A total score, ranging from 0 to 117, is