Further psychometric refinement of depressive rumination: Support for the Brooding and Pondering factor solution in a diverse community sample with clinician-assessed psychopathology

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Poster Presented at the Annual Meeting of the Association for Advancement of Behavior Therapy, New Orleans, LA, November 2004

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INTRODUCTION

Depressive Rumination

Depressive rumination, defined as the process of “focusing passively and repetitively on one’s symptoms of distress and the meaning of those symptoms without taking action to correct the problems one identifies,” (Nolen-Hoeksema, 1998; p. 216) is commonly assessed using Nolen-Hoeksema’s Response Styles Questionnaire (RSQ; Nolen-Hoeksema & Morrow, 1991). Depressive rumination has been associated with gender differences in depression prevalence rates (Nolen-Hoeksema, 1987), and the onset (Just & Alloy, 1997), deteriorating course (Kuehner & Weber, 1999), chronicity (Nolen-Hoeksema, 2000), and duration of depressed mood (Just & Alloy, 1997; Nolen-Hoeksema et al., 1993). Despite these empirical findings, research into the rumination construct has yielded equivocal and sometimes conflicting results. Recent research has suggested that these inconsistencies may be reflective of psychometric shortcomings of the RSQ.

Factor Structure of Depressive Ruminations

Considerable evidence indicates that the RSQ Ruminative Response Scale (RRS) consists of items confounded with the construct of depression (Bagby & Parker, 2001; Roberts et al., 1998) as well as a heterogeneous factor structure (Bagby & Parker, 2001; Cox, Enns, & Taylor, 2001; Fresco et al., 2002; Fresco et al., unpublished manuscript; Roberts et al., 1998). These psychometric shortcomings may adversely influence the results of studies employing the RRS. In response to these criticisms, Treynor, Gonzalez, and Nolen-Hoeksema (2003) rationally eliminated items from the RSQ related to the symptoms of depression and developed a non-affectively-confounded two-factor (Brooding and Pondering) solution for the RSQ in which Brooding was shown to be more strongly associated with depressed mood than was Pondering. Treynor et al.’s solution was subsequently replicated using exploratory and confirmatory factor analysis in both an unselected sample of college students and a sample of college students who endorsed cognitive vulnerability to depression (Fresco et al., unpublished manuscript). Support for the Brooding and Pondering solution was also found in a sample of currently and previously depressed adults (Haigh et al., 2004; Poster 35 of this session).

Limitations of the Brooding and Pondering Factor Structure

Despite the potential utility of Treynor et al.’s (2003) factor solution, two significant limitations related to item content reduce its immediate applicability. First, Treynor et al. used a version of the RRS that included three additional items not found in the most commonly used form of the 22-item version of the RRS. Only eight (3 Brooding items and 5 Pondering items) of the 10 items from Treynor et al.’s factor solution are available in the 22-item version of the RRS. This inclusion of uncommon items makes it difficult to apply Treynor et al.’s findings to studies and data sets using the more common, 22-item format. Second, despite Treynor et al.’s removal of affectively confounded items, two items from the Pondering factor allude to depressed symptoms or experiences (e.g., “Analyze recent events to try to understand why you are depressed”). This affect-laden content likely continues to conflate the association of the Pondering factor with depressed mood.

The Present Study

The present study sought to address the empirical disconnect between Treynor et al.’s (2003) factor structure using a non-standard version of the RRS and the more commonly used 22-item RRS. To remedy these limitations, the present study:

1. Used the 22-item RRS
2. Eliminated any affectively confounded items from Treynor et al.’s (2003) Brooding and Pondering factor solution
3. Tested the psychometric characteristics of the new Brooding and Pondering subscales in a large clinically diagnosed sample

It was hypothesized that a meaningful Brooding and Pondering solution could be extracted from the 22-item RRS for use in studies not administering the complete 71-item RSQ.

METHOD

Participants

Participants consisted of 164 adults from the community (76% female) who completed the study for course credit. Participants reported an average age of 33.94 years (SD = 10.02). The racial composition of this sample was 57.9% Caucasian, 13.4% Asian/Asian American, 2.4% African-
American, 1.8% Hispanic, and 4.3% self-reported “other;” 20.1% declined reporting ethnicity information. Sixty-three participants had not experienced any lifetime psychiatric conditions, whereas the remaining 101 participants endorsed significant current or lifetime psychopathology (Current major depression: \( n = 60 \); past major depression: \( n = 20 \); current social phobia: \( n = 8 \); current panic disorder: \( n = 7 \)). Participants were excluded only if they failed to complete all 8 of the RRS items used in the CFA analysis.

### Procedure
All participants completed the Structured Clinical Interview for DSM-IV (SCID) as well as self-report measures of rumination, emotion regulation, and depression and anxiety symptoms.

### Measures
The Response Styles Questionnaire (RSQ; Nolen-Hoeksema & Morrow, 1991) is a 71-item self-report instrument designed to assess an individual’s characteristic tendency to engage in ruminative, distracting, problem-solving, or dangerous coping behavior in the presence of a dysphoric or stressful situation. Depressive rumination is typically assessed with the 22-item RRS subscale.

The Beck Anxiety Inventory (BAI; Beck, Epstein, Brown, & Steer, 1988) is a 21-item measure assessing the severity of anxiety symptoms.

The Beck Depression Inventory (BDI; Beck, Rush, Shaw, & Emery, 1979) is a 21-item measure assessing the severity of depressive symptoms.

The Global Assessment of Functioning (GAF; First, Spitzer, Gibbon, & Williams, 2001) measure is the DSM-IV GAF rating obtained from the SCID.

The Emotion Regulation Questionnaire (ERQ: Gross & John, 2003) is a 10-item rationally derived measure of two aspects of emotion regulation. The reappraisal subscale assesses the ability to modify or change the emotions one experiences. The suppression subscale assesses the ability to avoid or prevent the expression of emotions.

### RESULTS

**Initial Item Examination**

The 8 RSQ items (items 18, 22, 25, 28, 30, 40, 53, & 56) comprising the Treynor et al. (2003) Brooding and Pondering factors found on the 22-item RRS subscale of the RSQ were first examined for depressive item content. On the basis of this examination, RSQ items 18 (“Analyze recent events to try to understand why you are depressed”) and 53 (“Analyze your personality to try to understand why you are depressed”) were excluded (see Table 1).

**Initial Confirmatory Factor Analysis**

Following removal of items contaminated by depressed mood content, the remaining 6 RSQ items from the 22-item RRS were submitted to CFA (Figure 1). As illustrated in Figure 1, the CFA model consisted of two factors representing Brooding (RSQ 22, 30, & 40) and Pondering (RSQ 25, 28, & 56). Based on Hu and Bentler’s (1999) criteria for model fit, this model showed adequate to good fit \( \chi^2(8) = 22.43, p = .004; CMIN/DF = 2.80; TLI = 0.90; CFI = 0.95; 90\% \text{ Confidence Interval on RMSEA} = 0.06 - 0.16; SRMR = 0.05 \). Reliability for both the Brooding (\( \alpha = .72 \)) and Pondering (\( \alpha = .75 \)) factors was found to be acceptable.

**Structural Equation Model**

Following the initial CFA model, a second model correlating the latent Brooding and Pondering factors with the observed exogenous (criterion) variables of anxiety, depression, global assessment of functioning, and emotion regulation indices of reappraisal and suppression, and problem reappraisal was tested (Figure 2). This model demonstrated an outstanding fit to the data \( \chi^2(28) = 51.93, p = .004; CMIN/DF = 1.85; TLI = 0.93; CFI = 0.97; 90\% \text{ Confidence Interval on RMSEA} = 0.04 - 0.10; SRMR = 0.05 \).

Although Brooding and Pondering were significantly correlated with one another (\( r = .48 \)), Brooding demonstrated significant correlations with measures of depression (\( r = .61 \)), anxiety (\( r = .53 \)), global functioning (\( r = -.57 \)), and reappraisal (\( r = -.39 \)), whereas Pondering did not (Table 2). Tests of dependent correlations (Bruning & Kintz, 1987) indicated that the magnitude of the difference between the correlations of Brooding and Pondering with the criterion measures exceeded Cohen’s (1988) convention for a large (\( d = .80 \)) effect size (Table 3).

**DISCUSSION**

Results from the present study continue to lend support to the psychometric validity of Treynor et al.’s (2003) Brooding and Pondering factor structure. Furthermore, these results support the validity of the 3-item Brooding and 3-item Pondering subscales derived from the RRS-22, suggesting that this 6-item solution can be used when the 10-item Brooding and Pondering solution is unavailable. However, additional research on this issue is needed before statements about the interchangeability of the two factor solutions can be made. Moreover, findings from the current study replicate and extend results of previous studies (Fresco et al., 2004; Haigh et al., 2004) indicating that Brooding represents the component of depressive rumination, relatively unconfounded with the measurement of depression, that is associated with depression, anxiety, and deficits in adaptive emotion regulation.
REFERENCES


Table 1: Brooding and Pondering items contained within RRS-22

<table>
<thead>
<tr>
<th>RRS Item #</th>
<th>Item</th>
<th>Factor</th>
<th>Depressive Content?</th>
</tr>
</thead>
<tbody>
<tr>
<td>RSQ 18</td>
<td>Analyze recent events to try to understand why you feel depressed</td>
<td>Pondering</td>
<td>Yes</td>
</tr>
<tr>
<td>RSQ 22</td>
<td>Think “Why do I always react this way?”</td>
<td>Brooding</td>
<td>No</td>
</tr>
<tr>
<td>RSQ 25</td>
<td>Go away by yourself and think about why you feel this way</td>
<td>Pondering</td>
<td>No</td>
</tr>
<tr>
<td>RSQ 28</td>
<td>Write down what you are thinking about and analyze it</td>
<td>Pondering</td>
<td>No</td>
</tr>
<tr>
<td>RSQ 30</td>
<td>Think about a recent situation, wishing it had gone better</td>
<td>Brooding</td>
<td>No</td>
</tr>
<tr>
<td>RSQ 40</td>
<td>Think “Why do I have problems other people don’t have?”</td>
<td>Brooding</td>
<td>No</td>
</tr>
<tr>
<td>RSQ 53</td>
<td>Analyze your personality to try to understand why you are depressed</td>
<td>Pondering</td>
<td>Yes</td>
</tr>
<tr>
<td>RSQ 56</td>
<td>Go someplace alone to think about your feelings</td>
<td>Pondering</td>
<td>No</td>
</tr>
</tbody>
</table>

Table 2: Correlations between latent Brooding and Pondering variables and observed criterion variables

<table>
<thead>
<tr>
<th></th>
<th>MEAN (SD)</th>
<th>BAI</th>
<th>BDI</th>
<th>GAF</th>
<th>Suppression</th>
<th>Reappraisal</th>
<th>Brooding</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BAI</td>
<td>7.87 (9.51)</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BDI</td>
<td>12.64 (12.56)</td>
<td>.62*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GAF</td>
<td>70.98 (17.15)</td>
<td>-.64*</td>
<td>-.84*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suppression</td>
<td>13.54 (5.02)</td>
<td>.02</td>
<td>.12</td>
<td>-.14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reappraisal</td>
<td>27.46 (6.94)</td>
<td>-.30*</td>
<td>-.52*</td>
<td>.42*</td>
<td>-.12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brooding</td>
<td>6.47 (2.52)</td>
<td>.53*</td>
<td>.61*</td>
<td>-.57*</td>
<td>.10</td>
<td>-.39*</td>
<td></td>
</tr>
<tr>
<td>Pondering</td>
<td>5.61 (2.38)</td>
<td>.03</td>
<td>.02</td>
<td>-.08</td>
<td>.11</td>
<td>.03</td>
<td>.48*</td>
</tr>
</tbody>
</table>

Note. BAI = Beck Anxiety Inventory; BDI = Beck Depression Inventory; Suppression = Emotion Regulation Questionnaire Suppression; Reappraisal = Emotion Regulation Questionnaire Reappraisal; Brooding = Response Styles Questionnaire Brooding; Pondering = Response Styles Questionnaire Pondering; * p < .05
Table 3: Tests of dependent correlations between RSQ-Brooding and RSQ-Pondering on criterion measures

<table>
<thead>
<tr>
<th>Criterion</th>
<th>t</th>
<th>p</th>
<th>Cohen’s d</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAI</td>
<td>t(161) = 7.69</td>
<td>&lt; .0001</td>
<td>1.21</td>
</tr>
<tr>
<td>BDI</td>
<td>t(161) = 10.07</td>
<td>&lt; .0001</td>
<td>1.59</td>
</tr>
<tr>
<td>GAF</td>
<td>t(161) = 9.95</td>
<td>&lt; .0001</td>
<td>1.57</td>
</tr>
<tr>
<td>Suppression</td>
<td>t(161) = 0.13</td>
<td>= .90</td>
<td>.02</td>
</tr>
<tr>
<td>Reappraisal</td>
<td>t(161) = 5.47</td>
<td>&lt; .0001</td>
<td>.86</td>
</tr>
</tbody>
</table>

*Note. BAI = Beck Anxiety Inventory; BDI = Beck Depression Inventory; Suppression = Emotion Regulation Questionnaire Suppression; Reappraisal = Emotion Regulation Questionnaire Reappraisal*
Figure 1: Initial Confirmatory Factor Analysis Model (CFA) for RRS-22 Brooding and Pondering

Note: Error variances removed from model for clarity.
Figure 2: Structural Model Correlating Latent Brooding and Pondering Variables to Criterion Measures

Note: Error variances and criterion measure covariances removed from model for clarity; * \( p < .05 \)