

# Measuring Ruminative Responses by the Content Analysis of Essays: A Preliminary Study

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This study proposed a text content analysis method to measure ruminative responses as a complement to self-report questionnaires of rumination. Researchers established a content analysis rating system that followed expressive writing (Pennebaker, 1993, 1997; Pennebaker & Beall, 1986). Based on the Response Style Theory (Nolen-Hoeksema, 1987, 1991) and additional theory refinements (Treyner, Gonzales, & Nolen-Hoeksema, 2003), rumination was categorized as either brooding or reflection. Essays about stressful experiences written by 98 university students were evaluated by three trained raters on the frequencies of brooding, reflection, and problem-solving, along with the levels of negative emotions. Self-rated questionnaires, including the Chinese Response Style Questionnaire-short form, the Depression Anxiety Stress Scales short form, the Positive and Negative Affect Scale, and the satisfaction with life scale, were also conducted for comparison with the ratings from the content analysis. This content analysis method attained good inter-rater reliability and criterion-related validity. The analysis results supported the hypotheses that: (1) there is a relationship between two rumination subtypes, brooding and reflection; (2) brooding and reflection are both related to depressive emotions; (3) reflection is related to problem-solving, which indicated the possibility of the adaptiveness of reflection; (4) brooders had more negative emotions related to self-blame, which explains the maladaptiveness of brooding. **Conclusions:** The content analysis method measured ruminative responses and the adaptiveness of rumination. The method kept participants' attention in the given context and prevented them from distraction when they presented their ruminative responses. These advantages might make the content analysis method surpass self-rated questionnaires when measuring rumination. This preliminary study on ruminative content, which had previously been insufficiently examined, provides future directions for improving the measure of rumination.

**Keywords:** *Brooding; Content Analysis; Problem-solving; Reflection; Ruminative response*

## Extended Abstract

Research has shown that rumination predicts psychological distress, such as depression (Kuehner & Weber, 1999; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008; Spasojević & Alloy, 2001). In Response Style Theory (RST; Nolen-Hoeksema, 1987, 1991), the ruminative response style is defined as a pattern of behaviors and thoughts that focus the individual's attention on his or her emotional state and inhibit actions that may distract the individual from his or her mood. Although RST has yielded important results, Smith and Alloy (2009), along with other researchers (i.e., Wells & Matthews, 1994, 1996), argued that the meaning

of rumination is different between theories and that rumination is a multifaceted construct that cannot be uniformly defined or measured.

Most of the mainstream measures of rumination use self-report questionnaires, with few measures directly examining and measuring the content and context of ruminative thoughts (Smith & Alloy, 2009). Thus, this study proposed a measure of ruminative responses based on text content analysis to complement current measures of rumination, such as the Ruminative Responses Scale (RRS; Nolen-Hoeksema & Morrow, 1991; Treyner et al., 2003). Although self-rating offers a convenient

and economical way to obtain rumination scores, the thought process of a person reviewing or rating his or her rumination remains unclear under such measurement conditions (Wang, Lee, & Chang, 2014). Therefore, by inviting people to write about a stressful personal experience and asking raters to evaluate these ruminative responses, the text content analysis method should offer a different point of view to describe multifaceted rumination. In addition, the role of rumination was examined because ruminative content is believed to include not only emotions, but also thoughts on problem solving (Lyubomirsky, Tucker, Caldwell, & Berg, 1999).

## Methods

### Participants

A sample of 98 participants (64 women) with good Chinese reading and writing skills was recruited from a subject pool at a university in Taipei, Taiwan.

### Procedure

The participants were asked to complete a series of online tasks, including self-rated questionnaires, writing (typing) an essay on a stressful experience in 8 minutes, and a debriefing session.

### Content analysis system

We developed a content analysis rating system based on expressive writing (Pennebaker, 1993, 1997; Pennebaker & Beall, 1986) and the principles of content analysis (Weber, 1990). These essays were rated based on their content code items, that is, the frequency of brooding, reflection, and problem solving, and the level of their emotional state (ranging from none: 1 to full: 5). Brooding was defined as a passive comparison of one's current situation to some unachieved standard, and reflection referred to a purposeful turning inward to engage in cognitive problem solving to alleviate one's depressive symptoms (Treyner, Gonzales, & Nolen-Hoeksema, 2003). The definition and construct of problem solving was based on the Social Problem-Solving model (D'Zurilla & Goldfried, 1971; Goldfried & D'Zurilla,

1996). Finally, emotional states covered positive emotions (such as happiness), negative emotions (such as sadness/depression), and a general level of emotional expression.

### Inter-rater reliability

The raters were one of the authors and two others who were well-trained. Inter-rater reliability (Pearson's  $r$ ) for each pair of raters for each code or state ranged from .75 to .91, which is acceptable according to Salkind (2010).

### Self-rated questionnaires

The questionnaires used for criterion-related validity included the Depression Anxiety Stress Scales short form (DASS-21; Lovibond & Lovibond, 1995; Lu, 2008), the Positive and Negative Affect Schedule (PANAS; Teng & Chang, 2006; Watson, Clark, & Tellegen, 1988), and the Satisfaction with Life Scale (SWLS; Diener, Emmons, Larson, & Griffin, 1985; Wu & Yao, 2006). The Chinese Response Style Questionnaire-short form (CRSQ-20; Yu, Chen, & Chang, 2008) was also used to compare the content codes and ratings of content analysis.

## Results

This content analysis method had good internal consistency and criterion-related validity. In line with Treyner et al. (2003), the content analysis results confirmed the relationship between two rumination subtypes, brooding and reflection ( $r = .29, p < .01$ ), and both were related to sad/depressed emotional state ( $r = .45$  and  $.23, p < .05$ ). Brooding was correlated with negative affect in the PANAS ( $r = .20, p < .05$ ), while there was no relationship between reflection and the other external criterion index. The main negative emotional states were intercorrelated ( $r = .34$  to  $.51, p < .01$ ) and were related to the maladjustment index. For example, sad/depressed emotional state was related to the Stress subscale of the DASS-21 ( $r = .21, p < .05$ ). Frustrated emotional state was related to the Anxiety subscale, the Stress subscale, and the total score of the DASS-21, and negative affect in the PANAS ( $r = .21$  to  $.24, p < .05$ ). General emotional

expression was related to negative affect in the PANAS ( $r = .21, p < .05$ ). Finally, shame/guilt was negatively related to positive affect in the PANAS ( $r = -.23, p < .05$ ).

Regarding adaptive and maladaptive rumination, reflection was related to problem solving ( $r = .25, p < .05$ ). Problem solving was negatively correlated with the DASS-21 ( $r = -.21, p < .05$ ) and positively correlated with the SWLS ( $r = .26, p < .05$ ). In addition, compared with non-brooders, brooders scored higher on negative emotional states (i.e., sad/depressed, frustrated) associated with self-blame and personal failure.

There was no relationship between the content code items and the CRSQ-20. There was also no relationship between emotional states and the CRSQ-20, except for a positive correlation between general emotional expression and the CRSQ-20 ( $r = .28, p < .01$ ). However, the CRSQ-20 was correlated with negative affect in the PANAS ( $r = .48, p < .01$ ), the subscale scores and total score of the DASS-21 ( $r = .33$  to  $.44, p < .01$ ), and with the SWLS ( $r = -.40, p < .01$ ).

The number of words in the essays was correlated with the frequency of content codes. Pearson's  $r$  was  $.30$  ( $p < .01$ ) for brooding,  $.50$  ( $p < .001$ ) for reflection,  $.52$  for the combined frequency of brooding and reflection, and  $.56$  ( $p < .001$ ) for problem solving. The number of words in the essays ranged from 126 to 956, with a mean of 338.54 and a standard deviation of 136.35.

## Discussions & Conclusions

This study developed a text content analysis method to measure rumination in a condition that focused

the participants' attention on the chosen context and prevented them from being distracted when presenting their ruminative responses. These advantages may allow this content analysis method to outperform self-rated questionnaires when researchers attempt to measure rumination from a multifaceted view. It supported the relationship between brooding and reflection and their relationship with negative emotional states, consistent with the results of Treynor et al. (2003). In addition, the relationship between reflection and problem solving indicated the possibility of adaptive reflection. Finally, the association between brooding and multiple negative emotions/cognitions explained why brooding may be a maladaptive strategy.

To our knowledge, this preliminary study on ruminative content is the first study in Chinese context and Chinese language. It also provides future directions for improving rumination measurements and psychotherapy applications. First, the time-limited essay writing task may limit content, thereby eliminating people who need more words to express rumination. A longer writing time or the promotion of more expressive writing may be useful to improve this method and its association with other external criteria. Second, the student sample was relatively homogenous with less varied experiences. Therefore, recruiting different samples with more variety should increase the richness of the content. However, this content analysis indicated that focusing on reflection related to problem solving, in addition to distraction, could potentially be therapeutic. Finally, this study emphasized the importance of mixed design, with qualitative and quantitative studies complementing each other.

