J. Behav. Ther. & Exp. Psychiat. 43 (2012) 910–914

Contents lists available at SciVerse ScienceDirect

Journal of Behavior Therapy and Experimental Psychiatry

journal homepage: www.elsevier.com/locate/jbtep

How ruminative thinking styles lead to dysfunctional cognitions: Evidence from a mediation model

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ARTICLE INFO

Article history:
Received 20 November 2010
Received in revised form
10 May 2011
Accepted 1 September 2011

Keywords:
Rumination
Stress
Dysfunctional attitudes
Depressive symptoms
Cognitive reactivity

ABSTRACT

Background and Objectives: Dysfunctional attitudes and a ruminative thinking style are of utmost clinical importance because they are found to be crucially implicated in depression vulnerability. In this study, based on the Diathesis-Stress model (Beck, 1967) and the Differential Activation Hypothesis (Teasdale, 1988), we investigated whether inter-individual differences in a ruminative thinking style would be related to the development of depressive symptoms, leading to the activation of dysfunctional attitudes under stress.

Methods: Seventy-six never depressed undergraduate students completed internet questionnaires measuring rumination, depressive symptoms and dysfunctional attitudes at 4 fixed moments in time (T1, T2, T3, T4): T1 was performed six weeks before their exams (considered as a low stress period); T2, T3 and T4 were performed during three consecutive weeks in their final exams (considered as life stress event).

Results: As expected, results revealed that the relationship between rumination, measured both out of (T1) and in (T2) a stressful period, and dysfunctional attitudes (measured at T4) was mediated by increased depressive symptoms (measured at T3).

Limitations: Because the questionnaire for rumination was developed in the context of understanding responses to depressive symptoms, there might be a construct overlap between the predictor and the mediator of the models that were tested. Moreover, because only healthy undergraduates were included, our results demonstrate a decreased generalizability.

Conclusions: These findings indicate that rumination can be conceived as a stable and underlying mechanism leading to depressed mood and dysfunctional attitudes under stress. Moreover, our findings highlight that clinical interventions should not only target dysfunctional schemas and attitudes, but might also benefit from the use of procedures aimed at changing processes such as a ruminative thinking style.

1. Introduction

The Diathesis-Stress model (Beck, 1967), the most prominent cognitive framework for depression vulnerability, purports that negative cognitions remain latent until activated by stressful events. These negative cognitions or schemata embody a constellation of dysfunctional attitudes such as negative representations of self-referent information and rigid, unrealistic pessimistic perspectives (Beck, 1967). This activation process of dysfunctional attitudes following a stressful event is referred to as "cognitive reactivity" and has been related to the onset, relapse and recurrence of depression (Beck, Rush, Shaw, & Emery, 1979). Current interventions such as cognitive behaviour therapy focus mainly on the content of these dysfunctional cognitions. Although these cognitive/behavioural treatment options for depression reveal to be successful in the short term (Hollon & Dimidjan, 2009), relapse or recurrence rate after remission or recovery remains very high (Segal, Pearson, & Thase, 2003). This indicates that current treatment options might be insufficiently successful in identifying and diminishing underlying vulnerability mechanisms that set depressive symptoms and dysfunctional attitudes in motion. Interestingly, the mere presence of a stressful event seems not to be enough to activate dysphoric mood and dysfunctional attitudes and conjures questions regarding individual differences in this cognitive reactivity. For example, what are the underlying mechanisms

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0005-7916/$ – see front matter © 2012 Published by Elsevier Ltd.
doi:10.1016/j.jbtep.2011.09.001

that allow stressors to trigger depressive symptoms and dysfunctional attitudes? To answer this question, it is important to study healthy people with no prior history of depression because their stress reactivity cannot be influenced by former depressive episodes, which are a good predictor of increased cognitive reactivity (for a review, see Scher, Ingram, & Segal, 2005).

Until recently, dysfunctional attitudes were considered a cognitive vulnerability factor that moderates the relation between stressors and increased psychological distress (e.g., negative mood, frustration, anxiety, …). From this perspective, dysfunctional attitudes are considered latent cognitions that, when activated by a stressor, lead to a product of psychological distress (Beck et al., 1979). However, an important question is why stress would lead to the activation of dysfunctional attitudes in some individuals, whereas other individuals cope in a more healthy way. To account for these inter-individual differences, the Differential Activation Hypothesis of Teasdale (1988) proposes that, during stressful periods, negative mood leads to the activation of negative cognitive schemas (such as dysfunctional attitudes) because during prior depressogenic experiences, the association between negative mood and depressogenic schemas has been strengthened. In line with the Differential Activation Hypothesis, research has shown that dysfunctional attitudes only become manifest when activated by a depressed mood (e.g., Segal, Gemar & Williams, 1999). However, these studies yielded also mixed results (for a review, see Scher et al., 2005), implying that there might be other underlying processes explaining the onset of dysfunctional attitudes. Recently, a ruminative thinking style has been proposed as an important mechanism in relation to the onset of dysfunctional attitudes, based on its association with a negative attentional biases, sustained negative mood states, increased vulnerability for depression, and being stable beyond the depressive episode (for a review, see Smith & Alloy, 2009). A ruminative thinking style (rumination) is considered a stable trait-like tendency to respond to stressful life events with repetitive and automatic self-focused thoughts about the origin, the causes and consequences of these depressogenic circumstances (Nolen-Hoeksema, 1991).

Although previous studies have emphasised the relationship between the stressor and the activation of dysfunctional attitudes (e.g., Hankin, Abramson, Miller, & Haeffel, 2004), and the relationship between cognitive reactivity and rumination (Moulds et al., 2008), recent studies are starting to investigate the active role of rumination in the activation of dysfunctional attitudes and psychological distress. For example, Morrison and O'Connor (2005) found that rumination in response to life stressors predict psychological distress (operationalized as dysphoria, hopelessness and suicidal thinking). However, in these studies the relationship between dyphoric mood and negative thoughts is not investigated separately.

Based on these research findings and the Differential Activation Hypothesis (Teasdale, 1988), we could hypothesise that, during stressful periods, rumination might lead to dysphoria, which in turn, would activate dysfunctional attitudes. This implies that rumination is not conceived as a mere product of distress but as a fundamental mechanism leading to dysfunctional attitudes. Depressive symptoms would then mediate the relation between a ruminative thinking style and the activation of dysfunctional attitudes. This specific model fits with the observation that rumination is a stable vulnerability factor that prospectively predicts depression (Nolen-Hoeksema, 2000; Spasojevic & Alloy, 2002). Dysfunctional attitudes refer to negative representations and dysfunctional cognitions of self-referent information and rigid, unrealistic pessimistic perspectives (Beck, 1967). Testing of this model requires the use of a prospective design with a temporal order between multiple data points to investigate the influence of rumination on the development of depressive symptoms and dysfunctional attitudes under stress. This mediation model can be tested using the statistical model proposed by Baron and Kenny (1986), based on a set of regression analysis, combined with bootstrapping (see Preacher & Hayes, 2004). To the author's best knowledge, this mediation model has never been investigated in prior research.

Hence, we set up a large study with a group of healthy students with no prior history of depression, and tested them at four moments in time (T1, T2, T3, T4). The first test moment was out of a stressful period (T1); and the last three test moments fell on three consecutive weeks during a stressful period (T2, T3, T4). Importantly, these latter three consecutive weeks fell during their final examination, which is a naturally occurring stressor, and testing was fixed on the same day of each week. All participants reported their rumination tendency, depressive symptoms and dysfunctional attitudes on each test moment. Considering that rumination is a stable vulnerability factor, we tested a model containing the tendency to ruminate during a period of low stress (T1), but also a model with an indication of rumination during a stressful period (T2). We were interested in a measure of depressive symptoms on T3 and dysfunctional attitudes on T4, both administered during the stressful examination period. Because of this specific temporal order of these latter variables, we were able to test whether the relationship between rumination and dysfunctional attitudes was mediated by depressive symptoms.

2. Methods

2.1. Participants

A total of seventy-six students of Ghent University (61F/16M) with a mean age of 20.49 years (SD = 1.82) participated in this study. The absence of a history of a major depressive episode or current depression was confirmed using the structured Mini International Neuropsychiatric Interview (MINI – Sheehan et al., 1998; Dutch version of van Vliet, Leroy, & Van Megen, 2000). After receiving a complete verbal description of the study, they all provided written informed consent (protocol approved by the local ethics committee of Ghent University). Participants received a financial reward for participation. This study is part of a larger project, also investigating the influence of attentional bias on stress related rumination.

2.2. Materials

2.2.1. Rumination

The *Ruminative Response Scale (RRS)* (Nolen-Hoeksema & Morrow, 1991; Dutch translation by Raes & Hermans, 2007) was administered to measure ruminative thinking styles. The RRS consists of items that describe responses to a depressed mood, related to focussing on the self, on symptoms, and on the origin and consequences of the distress. This self report questionnaire consists of 26 questions to which participants respond on a 4-point Likert scale how often they engage in these responses (i.e. 1 = almost never, 2 = sometimes, 3 = often, 4 = most of the times). Instructions of the RRS we administered six weeks before the start of the exams were related to "how they responded in general", whereas instructions of the RRS we administered during the exams were related to "how they responded over the last week".

2.2.2. Depressive symptoms

The *Beck Depression Inventory II* (BDI-II; Beck, Steer, & Brown, 1996; Dutch translation by Van der Does, 2002a) was administered to screen for depressive symptoms and dysphoria over the