Behaviour Research and Therapy 51 (2013) 300–306

Contents lists available at SciVerse ScienceDirect

Behaviour Research and Therapy

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

Understanding depressive rumination from a mood-as-input perspective: Effects of stop-rule manipulation

Jason C.S. Chan [a], Graham C.L. Davey [b], Chris R. Brewin [a,*]

[a] Clinical, Educational & Health Psychology, University College London, Gower Street, London WC1E 6BT, UK
[b] School of Psychology, University of Sussex, UK

ARTICLE INFO

Article history:
Received 13 March 2012
Received in revised form
3 December 2012
Accepted 12 February 2013

Keywords:
Depression
Rumination
Mood
Perseveration
Metacognition

ABSTRACT

The current study tested the mood-as-input hypothesis account of perseverative rumination in 25 participants with a diagnosis of major depressive disorder and 25 healthy controls. It also examined the factors underlying mood changes within a bout of rumination and their relations with trait rumination and metacognitive beliefs about rumination. A structured rumination interview was used to facilitate participants' reflection on two previous depressive incidents while deploying a specific stop-rule for the task (either a goal-guided or feeling-guided stop-rule). As predicted by the mood-as-input hypothesis, perseveration exhibited by depressed participants was affected by the interaction between diagnosis and stop-rule, with levels of perseveration being greatest when depressed participants used the goal-guided stop-rule. Increases in negative mood over the rumination interview were shown to be influenced only by participants' diagnostic status, regardless of their stop-rule. Compared to healthy controls, depressed participants also reported a preferential use of the goal-guided stop-rule in response to negative mood states in their daily lives. The findings about the dependence of rumination on stop-rule use within the depressed sample support the use of metacognitive treatment approaches in which patients are encouraged to challenge negative beliefs about the controllability of rumination.

Major depressive disorder (MDD) is a debilitating psychological disorder characterised by prolonged and recurrent periods of low mood, a loss of interest and motivation in enjoyable activities, sense of worthlessness and in some cases, suicidal thinking (American Psychiatric Association, 1994). Mounting research evidence shows that ruminative thinking, broadly defined as a persistent, repetitive, and self-focussed thinking style concerned with the causes, meanings, and consequences of dysphoric mood or stress, is closely related to the onset, number, or length of depressive episodes (Moberly & Watkins, 2008, 2010; Robinson & Alloy, 2003; Rood, Roelofs, Bögels, Nolen-Hoeksema, & Schouten, 2009; Watkins, 2008), and may also be related to the outcome of psychological therapy for depression (Jones, Siegle, & Thase, 2008). Little is known about why depressed people tend to ruminate, and it is possible that general psychological models of perseverative behaviour are relevant both to understanding decisions about when to stop ruminating and to improving what are the currently modest outcomes of psychological therapy for depression (Fava, Ruini, & Belaise, 2007). This study experimentally tested predictions derived from the "mood-as-input" model of perseveration (Martin, 2000; Martin, Tesser, & McIntosh, 1993; Meeten & Davey, 2011) in an attempt to identify factors affecting rumination in a clinically depressed sample.

The literature contains a number of theoretical models, most of which are primarily concerned with the triggers, content and focus of ruminative thinking. For instance, the response styles theory suggests that rumination is a self-focussed, repetitive thinking style triggered in response to depressive symptoms (Nolen-Hoeksema, 1991; Nolen-Hoeksema, Wisco, & Lyubormirsky, 2008); other models argue that rumination is focussed primarily on negative emotional states (Conway, Csank, Holm, & Blake, 2000); and the stress-reactive formulation argues that depressive rumination is precipitated by stressful life events (Robinson & Alloy, 2003). Despite their differences, these models mostly assume a direct relationship between rumination and its precipitating factors, and do not offer a detailed explanatory account for the recurrent and perseverative nature of rumination episodes.

One exception to this are control theory approaches, which postulate that rumination is triggered by a discrepancy in goal progress and serves to facilitate progress towards the unresolved goal (e.g., Martin & Tesser, 1996). Within this account, rumination continues until the goal is either met or disengaged from, and

* Corresponding author.
E-mail address: c.brewin@ucl.ac.uk (C.R. Brewin).

0005-7967/$ – see front matter © 2013 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.brat.2013.02.007

becomes perseverative when the goal can neither be met nor disengaged from. The mood-as-input model of perseveration (Martin, 2000; Martin, Tesser, et al., 1993; Martin, Ward, Achee, & Wyer, 1993) elaborates on how negative mood interacts with this process within a particular ruminative episode. Rather than mood being intrinsically linked to certain default processing strategies (such as mood-congruent processing), the model proposes that it is the informational value of the mood that has performance implications. For example, during the course of task performance, people may ask themselves, either explicitly or implicitly, 'Have I reached my goal?' People experiencing a positive mood are likely to interpret this as a sign that they have made progress towards their goal, whereas people experiencing a negative mood are likely to interpret this as a sign that they have not made progress towards their goal. Whether or not they persevere depends additionally on the nature of the task and on the 'stop-rules' associated with it.

'Stop-rules' are functional concepts used to describe the intuitive decision-making criteria and strategies a person uses to determine whether the goal of the current task has been met and, therefore, whether the task can be terminated. Martin, Ward, et al. (1993) first used the concept of an 'as-many-as-can' (AMAC) stop-rule during a word generation task. In their experimental condition, participants in either a positive or negative mood were asked to stop the task only when they had reached the goal of generating as many bird names as possible. The results were contrasted with those of the same participants while using a 'feel-like-continuing' (FLC) stop-rule that instructed them to stop when they were no longer enjoying it. The results showed that participants using the AMAC stop-rule (i.e., were primarily guided by their goal in deciding when to stop) persisted in the task for longer than those using the FLC stop-rule (i.e., were primarily guided by their feelings in deciding when to stop), but only if they were in a negative mood state.

The authors concluded that mood states carry different meanings for individuals according to the stop-rule they have adopted. That is, they use their moods to evaluate if they have met their current goal and whether or not they should continue. A negative mood causes them to be unsatisfied with their progress and, if they are using an AMAC or goal-guided rule, to persevere. If using an FLC or feeling-guided rule, however, negative mood would signal a lack of enjoyment and enable them to terminate the task. Applied to perseverative behaviours such as rumination and worry, the model suggests that these occur because individuals prone to these symptoms preferentially apply goal-guided stop-rules when deciding whether to stop worrying or ruminating. As suggested by research on the positive beliefs depressed people often hold about rumination (Papageorgiou & Wells, 2001a), such goals might include understanding one's depression or solving current problems. Using attainment of these goals as their stop-rule would tend to result in individuals ruminating until they had exhausted the current line of thinking, or thought about the subject as much as they could.

Research has repeatedly shown that the use of an AMAC stop-rule in the context of negative mood states leads to perseverative worrying (Meeten & Davey, 2011). In comparison, depressive rumination has received relatively little attention from a mood-as-input perspective. Existing research suggests that worrying and rumination are two highly similar cognitive processes (e.g., Fresco, Frankel, Mennin, Turk, & Heimberg, 2002). For instance, studies of clinical patients have shown that measures of rumination and worrying remained significantly correlated even after depressive and anxious symptoms were controlled for (Beck & Perkins, 2001; Segerstrom, Tsao, Alden, & Craske, 2000). It seems reasonable to speculate that there are commonalities in the mechanisms which underlie the perseverative nature of both pathological worrying and rumination.

So far, evidence for the mood-as-input model of perseverative rumination has come from two empirical studies using a rumination interview paradigm (Hawksley & Davey, 2010; Watkins & Mason, 2002). The rumination interview is a structured interviewing procedure adapted from the catastrophising interview task (Vasey & Borkovec, 1992) to objectively measure ruminative perseveration. The study by Watkins and Mason (2002) found that, while using the AMAC (goal-guided) stop-rule, individuals who rated themselves highly on trait-rumination tended to perseverate for significantly longer than low ruminators. The same pattern was reported by Hawksley and Davey (2010) who compared participants who underwent either a positive or negative mood-induction. However, this difference was not present in either of the studies when participants were asked to use the FLC (feeling-guided) stop-rule, regardless of their mood-state or level of trait rumination. These findings resemble data collected on the perseverative mechanism underlying anxious worrying (e.g., Startup & Davey, 2001).

To date, no study has investigated the mood-as-input hypothesis of rumination within a clinically depressed population. Such an investigation is important, as rumination in the context of clinical depression may differ from everyday ruminative behaviours in a number of ways. For instance, people with depression tend to have a higher level of trait-rumination and think less concretely and specifically than non-depressed individuals (Stöber & Borkovec, 2002; Watkins & Moulds, 2007). These characteristics may be more relevant to explaining perseveration in ruminative bouts than are the variables proposed by the mood-as-input model. Of particular interest in the present study is the relation of stop rules to metacognitive beliefs, i.e., beliefs about one's mental processes. As noted above, previous studies have shown that high-ruminators and patients diagnosed with major depressive disorder (MDD) hold specific beliefs about the usefulness of rumination (Papageorgiou & Wells, 2001a, b; 2003), consistent with the self-regulatory executive function model (S-REF) of depression (Matthews & Wells, 2004). Beliefs that rumination is a useful strategy that helps one attain one's current goal bear a close resemblance to the idea that adopting the AMAC stop-rule may correspond to a goal-directed mental strategy (Martin, Tesser, et al., 1993; Martin, Ward, et al., 1993).

The current study compared the perseveration of depressed patients and non-clinical controls within a structured rumination interview. Specifically, we tested the prediction from the mood-as-input hypothesis that perseveration in the rumination interview would be predicted by the interaction of clinical status and stop-rule. In particular, we predicted that 1) depressed individuals would display greater perseveration while using a goal-guided than a feeling-guided stop-rule, and would only differ from controls in the former condition. We also examined mood changes during the rumination task under the two stop-rule conditions. Based on previous research on the association of negative affect and rumination, we predicted that 2) both depressed patients and controls would demonstrate a deterioration in mood over the rumination task. However, due to the lack of prior evidence, we made no specific prediction about the difference in mood change between the two stop-rule conditions. Use of a control condition without a specified stop rule was not considered appropriate as under these conditions all individuals were assumed to use implicit default stop rules their own. Instead, to support the external validity of the mood-as-input model in this sample, we investigated reported use of stop rules in everyday life. We hypothesised 3) that reported use of the goal-guided stop-rule would be greater in individuals who were clinically depressed than in controls. We also investigated whether higher trait rumination or more positive beliefs about rumination predicted additional variance in stop-rule use over and above clinical status.