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The Impact of Ruminative Processing on the Experience of Self Referent Intrusive
Memories in Dysphoria

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Running Head: Rumination and intrusions

Abstract

The current study sought to experimentally assess the differential effects of analytical ruminative processing and distraction on the experience of self-referent naturally occurring intrusive memories in a sample of dysphoric ($\text{BDI-II} \geq 12$) participants. Seventy seven undergraduate participants completed a memory interview to elicit details about a self-referential intrusion and were randomly assigned to either an analytical rumination or distraction condition. Subsequent to the rumination induction, participants rated their intrusive memory as more negative, more distressing, and more evocative of a negative emotional response compared to participants who were allocated to the distraction induction. Inducing analytical rumination also resulted in participants reporting worse (i.e., more sad) mood relative to those in the distraction condition. The findings align with the suggestion that depressed individuals may get caught up in a ruminative cycle that, due to the documented effects of analytical self-focus, exacerbate the emotional response elicited by intrusions and perpetuate biased attentional focus on them. Directions for future investigations of the cognitive processes that are important in the maintenance of intrusions in depressive disorders are discussed.

Keywords: Depression, rumination, intrusive memories, self-focus

The Impact of Ruminative Processing on the Experience of Self Referent Intrusive Memories in Dysphoria

Depressive rumination has been defined as repetitive but passive thinking about current depression symptoms, and their causes, meanings and consequences (Nolen-Hoeksema, 1991). Correlational and longitudinal studies have demonstrated that rumination predicts the onset of depression and prolongs the experience of negative mood in dysphoric individuals (Just & Alloy, 1997; Nolen-Hoeksema, 2000; Nolen-Hoeksema, Parker, & Larson, 1994; Nolen-Hoeksema, Larson, & Grayson, 1999; Nolen-Hoeksema & Morrow, 1991; Nolen-Hoeksema, Morrow, & Fredrickson, 1993; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008; Vickers & Vogeltanz-Holm, 2003). Experimental studies have shown that inducing rumination by having participants read through various self-focusing statements (“Think about: the possible consequences of your current mental state”; see Nolen-Hoeksema & Morrow, 1991) for several minutes results in the maintenance or enhancement of negative mood in dysphoric and clinically depressed individuals. By comparison, reading distracting statements (e.g., “Think about: clouds forming in the sky”) has an ameliorative effect (Gibbons, Smith, Ingram, Pearce, Brehm, & Schroder, 1985; Lyubomirsky, Caldwell, & Nolen-Hoeksema, 1998; Lyubomirsky & Nolen-Hoeksema, 1995; Watkins & Teasdale, 2004).

These findings have been accounted for by Nolen-Hoeksema’s (1987) Response Styles Theory, which suggests that rumination has the effect of narrowing one’s attentional focus to negative information such that negative mood is exacerbated. By comparison, distraction permits a disruption in this attentional bias, thus allowing for

adaptive recourse (Nolen-Hoeksema, Morrow, & Fredrickson, 1993). Although the use of distraction may attenuate the experience of negative affective states, this attenuation may only occur under certain circumstances or provide remedial benefits in the short-term (Hamilton & Ingram, 2001).

Recent studies of rumination have highlighted that this cognitive process can be broken down into adaptive and maladaptive subtypes. The work of Watkins and colleagues (Watkins, 2004, 2008; Watkins & Teasdale, 2001, 2004) has highlighted the distinction between concrete/experiential self-focus, which involves a focus on moment-to-moment experience (e.g., '*How do I feel?*'), and abstract/analytical ruminative self-focus that is characterised by 'why' questions (e.g., '*Why do I feel this way?*'). There is evidence that the analytical mode of processing leads to poor social problem solving (Watkins & Moulds, 2005) and the maintenance of overgeneral memory retrieval (Watkins & Teasdale, 2004) in individuals with major depressive disorder. Further, participants who engaged in analytical rumination following a negative failure task reported resulted more intrusions about the task 24 hours later (Watkins, 2004) compared to participants who were engaged in an experiential mode of processing.

Mental intrusions, particularly in the form of memories of negative autobiographical events, are associated with ruminative self-focus (Starr & Moulds, 2006; Williams & Moulds, 2007a) and have been implicated in the maintenance of depressive symptoms (Brewin, Reynolds, & Tata, 1999). Watkins (2004) proposed that engaging in rumination following a negative event prevents successful emotional processing, and thus impacts upon the re-occurrence of the event (via intrusions) and on the distress associated with such intrusions. We addressed this hypothesis in a previous

study (Williams & Moulds, 2007b). Extending the work of Watkins (2004), we employed a film-clip to experimentally induce intrusions and explore the differential impact of an analytical, experiential, and distraction induction on the subsequent experience of intrusions of the content of the film-clip. While the film-clip was effective in creating intrusions that were comparable to naturally occurring intrusive memories (Williams & Moulds, 2007c), the results did not support our primary hypothesis that analytical processing would lead to increased intrusions relative to experiential processing.

One explanation that we put forward to account for these unexpected findings was the non self-referential nature of the intrusions. Self-referential material refers to information that is directly linked to one's sense of self and thus conveys important information about one's personal character. This can be contrasted with self-relevant material that is defined as information that is important to an individual but is not linked directly to their sense of self; that is, material that does not also hold self-referential meaning (Borton, Markowitz, & Dieterich, 2005). It may be that the effects of analytical rumination on intrusion characteristics are more toxic if the material is not only self-relevant, but is also self-referential. This notion served as the basis for experimental investigation in the current study. Additionally, given that previous studies have demonstrated that the distress caused by intrusive memories is independent of their frequency (Starr & Moulds, 2006, Williams & Moulds, 2007a, c), the null findings could also reflect measurement inadequacies. Specifically, the sole focus on intrusion frequency as the marker of unsuccessful processing may have prevented detection of changes in the affective impact of intrusive memories following rumination; for example, reductions in

intrusion-related distress. Accordingly, the current study indexed additional features of intrusive memories to gauge the respective impacts of the processing inductions.

In light of previous evidence suggesting it is specifically the analytical form of ruminative self-focus that leads to adverse outcomes (Watkins, 2004; Watkins & Moulds, 2005; Watkins & Teasdale, 2004), the current study sought to experimentally assess the differential effects of analytical ruminative processing and distraction on the *experience*, rather than the *frequency* of self-referent naturally occurring intrusive memories in a matched sample of dysphoric participants. We hypothesised that participants assigned to the analytical condition would report greater levels of post-manipulation intrusion-related distress, intrusion-related sadness, intrusion valence (negativity), and general negative affect (decreased positive mood and increases negative mood) than participants allocated to the distraction condition.

Method

Participant Sample Characteristics

One hundred and twenty undergraduate students from The University of New South Wales were initially recruited to participate in exchange for course credit. As the current study investigated intrusive memories in the context of dysphoria and depressed mood, only dysphoric participants (see below) were included in the analyses. The final sample consisted of 57 females and 20 males with a mean age of 19.57 ($SD = 5.16$)

Measures

Intrusive Memory Questionnaire. (Following Hackmann, Ehlers, Speckens, & Clark, 2004). The items on the Intrusive Memory Interview were drawn from a number of validated inventories and have been used in previous research (Williams & Moulds,

2007a, b, c). The questions relate to participants' subjective experience of a spontaneous memory that occurred within one week prior to the interview based on the following:

Sometimes we remember things without trying to – memories that just pop into our mind spontaneously or when we do not want them to. For example, if you had an argument with a friend and you later recalled memories about this argument (recalling what occurred, remembering what was said etc) when you were not deliberately thinking about the argument, we would call these spontaneous memories. Spontaneous memories can occur based on any past event that you have actually experienced. Memories are therefore different than general thoughts or worries about things. Keeping in mind that memories refer to specific events or incidents that have actually happened to you and which pop into your mind without you trying to remember them: in the past week, have you experienced any unwanted spontaneous memories of an unpleasant or negative event/circumstance/situation that has happened to you? This event could have occurred any time in your past and is not limited to a severe/traumatic event.

Information regarding intrusion frequency, content, and sensory modalities was also collected. Frequency information was based on the participant's report of how many times the memory spontaneously intruded within the one-week time period. Participants described both the content of the memory and the way in which they experienced the intrusions (visual, auditory, kinetic features).

Impact of Event Scale (IES; Horowitz et al., 1979).

The IES is a self-report questionnaire that has two subscales (Intrusion, Avoidance) that index the impact of a specific life event. The Intrusion subscale assesses the frequency and range of intrusions associated with the event and the Avoidance subscale assesses efforts to suppress thoughts and memories of the event. Internal consistencies of the Intrusion and Avoidance subscales have been reported as .78 and .82, respectively (Corcoran & Fischer, 1987, as cited in Brewin, 1998). The IES was modified for the purpose of the current study so that responses were anchored specifically to the intrusive

memory identified by the participant. Higher scores reflect greater degree of intrusiveness and avoidance. Internal consistency of the total scale was .87 in the current sample.

Primary Memory and General Affect Ratings.

Participants provided visual analogue ratings of their mood and how they currently evaluated their memory (i.e., in terms of negative valence, sadness, and distress) on a scale from 0 = *not at all* to 100 = *extremely*. These ratings were completed both before and after the experimental induction (approximately 45 minutes apart). The measure of general affect comprised the average of the sadness rating combined with the reverse-scored happiness rating. Internal consistency for the memory ratings at Time 1 and Time 2 (Cronbach's Alpha) were .85 and .83, respectively.

Manipulation Checks. Manipulation checks taken from Watkins and Teasdale (2001) were administered both before and subsequent to the experimental induction (described in the Procedures section). These items instructed participants to rate the degree to which they were self-focused (0 = *not at all focused on myself*, 100 = *extremely focused on myself*). Participants also rated the degree to which their thinking was abstract compared to concrete, and were given the following information to assist making this rating “thinking about the meaning of an event would be more abstract than thinking about what you did in a situation” (0 = *not thinking in an abstract way at all*, 100 = *thinking in an extremely abstract way*).

Beck Depression Inventory – Second Edition (BDI-II; Beck, Steer, & Brown, 1996).

The BDI-II is a 21-item self-report inventory that measures symptoms of depression.

Only participants who scored 12 or above were retained in the final sample. The BDI-II

possesses high internal consistency, with a reported alpha coefficient of .92 (Beck et al., 1996).

Ruminative Response Scale (RRS) of the *Response Styles Questionnaire* (RSQ; Nolen-Hoeksema & Morrow, 1991).

The RRS consists of 22 items that assess degree of ruminative coping style. The items index reactions to mood that are self-focused (e.g., *I think, "Why do I react this way?"*), symptom-focused (e.g., *"think about your feelings of fatigue"*), and focused on the mood's possible consequences and causes (e.g., *"I am embarrassing to my friend/family/partner"*). This measure shows good test-retest reliability (Nolen-Hoeksema et al., 1994) and internal consistency (Nolen-Hoeksema et al., 1991).

Cronbach's alpha was .92 in the current sample.

White Bear Suppression Inventory (WBSI; Wegner & Zanakos, 1994).

The WBSI is a 15-item self-report questionnaire that measures chronic thought suppression tendencies, or the deliberate attempt to avoid thinking about unpleasant thoughts. The authors report good internal consistency and test-retest reliability (alpha .89 and .80, respectively). Following the suggestion of Höping and de Jong-Meyer (2003), Intrusion and Suppression subscale scores were also calculated. The authors report good internal consistency and test-retest reliability (alpha .89 and .80, respectively). Internal consistency for this scale in the current study was also adequate for the Total, Suppression, and Intrusion scales (.89, .75 and .87, respectively).

Cognitive Avoidance Questionnaire (CAQ; Langlois, Lachance, Provencher, Freeston, Dugas, Fournier, et al., 1996).

The CAQ is a 25-item self-report scale with five subscales that measure Substitution of Disturbing Thoughts, Transformation of Mental Images into Verbal Thoughts, Distraction, Avoidance of Threatening Stimuli, and Thought Suppression. Internal consistency of the total scale is strong (.92; Gosselin, Langlois, Freeston, Ladouceur, Dugas, & Pelletier, 2002). Cronbach's alpha was .92 in the current sample.

Positive Beliefs about Rumination Scale (PBRs; Papageorgiou & Wells, 2001).

The PBRs is a 9-item scale that assesses positive metacognitive beliefs about the benefits of rumination (e.g., "*I need to ruminate about my problems to find answers to my depression*"). Respondents indicate the extent to which they agree with each of the items on a four-point Likert scale that ranges from 1 (*do not agree*) to 4 (*agree very much*). This measure was included to ensure that the experimental groups did not differ in terms of pre-existing beliefs about the utility of rumination, as differences on this variable may confound the findings. Cronbach's alpha was .87 in the current sample.

Procedure

After participants identified the presence of a negative intrusive memory they completed baseline ratings of mood, intrusion characteristics, and the battery of self-report questionnaires (with the exception of the rumination measures). Thirty seven participants were then randomly assigned to the distraction condition and 40 participants were assigned to the analytical condition. Participants in the analytical condition were administered the analytical induction that consisted of 28 statements, with the instructions employed by Watkins and Teasdale (2004), as follows: "*As you read the items, use your*

imagination and concentration to think about the causes, meanings, and consequences of the items. Spend a few moments visualizing and concentrating on each item, attempting to make sense of and understand the issues raised by each item.” Participants in the distraction condition were administered the first 28 statements of the standard Nolen-Hoeksema and Morrow (1993) distraction induction (i.e., in order to match the number of analytical induction statements presented). The inductions were delivered in timed Powerpoint slide format to ensure consistent exposure to each item across participants. Participants then completed manipulation check measures to ensure that the inductions had the intended effects. Finally, participants completed post-induction ratings of their mood and intrusion characteristics and the self-report measures of rumination.

Results

Memory Characteristics

Intrusive memory severity (i.e., degree of intrusion and avoidance, as indexed by IES scores) was moderately high across both groups, with a mean rating of 38.32 ($SD = 13.29$) for the distraction condition and a mean rating of 33.35 ($SD = 15.03$) for the analytical condition. Importantly, IES scores did not differ between the conditions, $t(75) = 1.53, p > .05$. Additionally, memory occurrence (the number of times that participants estimated that they experienced their intrusive memory in the week prior to the study) did not vary across the conditions. Specifically, participants assigned to the distraction condition reported an average of 4.75 ($SD = 4.05$) memory occurrences, and participants assigned to the analytical condition reported an average of 4.02 ($SD = 2.84$) memory occurrences, $t(75) = .92, p > .05$. Regarding intrusion content, across the total sample, 66% of participants’ memories were of interpersonal concerns, 10% of death or illness of

another, 8% of illness or injury to self, 4% of abuse or harassment, 4% of academic failures, and 8% were idiosyncratic memories that did not fit the preceding categories. Importantly, all memories included in the analyses were those described by participants as conveying personal information that inherently linked to one's sense of self; therefore, as being self-referential.

Depression Status, Cognitive Avoidance, and Manipulation Checks

Results of an independent samples *t*-test demonstrated that participants in the two conditions did not differ in terms of their dysphoria status. That is, mean BDI-II scores were 20.08 ($SD = 7.12$) for the analytical condition and 18.37 ($SD = 5.98$) for the distraction condition, $t(75) = 1.14, p > .05$. Similarly, independent samples *t*-tests confirmed that participants in the two conditions did not differ on indices of cognitive avoidance; specifically, on measures of suppression (WBSI), cognitive avoidance (CAQ), positive beliefs about the value of rumination (PBRs), and the trait tendency to ruminate (RRS). Additionally, the groups did not differ in their ratings of the frequency and degree of avoidance of their intrusive memory (as measured by the IES) (all t 's < 1.62 , all p 's $> .05$ for these analyses).

To ensure that the experimental inductions had the intended effects, a 2 (time: pre-, post-induction) $\times$ 2 (processing condition: analytical, distraction) repeated measures MANOVA with a between-subjects measure on the second factor was conducted with self-focus and abstract thinking entered as dependent variables. The main effect of time was not significant $F(2, 74) = 1.43, p > .05$, but as predicted, there was a significant time by condition interaction, $F(2, 74) = 21.46, p < .001$. Planned pair-wise contrasts revealed that participants who were assigned to the analytical condition reported a significant

increase in ratings of self-focus from pre- ($M = 59.25$, $SD = 25.35$) to post-induction ($M = 70.25$, $SD = 19.80$), $t(39) = 2.71$, $p < .01$. By comparison, participants who were assigned to the distraction condition reported a significant decrease in their ratings of self-focus from pre- ($M = 61.08$, $SD = 26.22$) to post-induction ($M = 44.86$, $SD = 29.30$), $t(36) = 2.5$, $p < .05$. For ratings of abstract thinking, comparisons revealed that participants assigned to the distraction condition reported a significant decrease from pre- ($M = 57.29$, $SD = 27.04$) to post-induction ($M = 38.37$, $SD = 26.61$), $t(36) = 4.14$, $p < .001$, while participants in the abstract conditioned reported an increase in their level of abstract thinking from pre- ($M = 57.00$, $SD = 20.90$) to post-induction ($M = 67.75$, $SD = 18.74$), $t(39) = 4.72$, $p < .001$.

Effect of Processing Manipulation on Intrusion Ratings

To test the main predictions that the analytical induction would result in greater levels of intrusion-related distress, intrusion-related sadness, intrusion valence (negativity), and general negative affect compared to the distraction induction, separate between-subjects ANCOVAs controlling for baseline ratings of these measures were conducted. For intrusion-related distress, there was a main effect of condition, $F(1, 74) = 4.50$, $p < .05$. Participants in the analytical condition rated their intrusion as more distressing ($M = 48.86$, $SD = 2.57$) compared to participants in the distraction condition ($M = 40.95$, $SD = 2.68$). For intrusion-related sadness, there was a main effect of condition, $F(1, 74) = 8.82$, $p < .01$, indicating that participants in the analytical condition rated their intrusion as more evocative of sadness ($M = 56.04$, $SD = 2.55$) than participants in the distraction condition ($M = 45.08$, $SD = 2.66$). For intrusion negativity, there was a main effect of condition, $F(1, 74) = 8.92$, $p < .01$, indicating that participants

in the analytical condition rated their intrusion as more negative ($M = 58.64$, $SD = 3.21$) compared to participants in the distraction condition ($M = 44.70$, $SD = 3.34$). Finally, for general affect there was a main effect of condition, $F(1, 74) = 5.16$, $p < .05$, such that participants in the analytical condition rated their mood as more negative ($M = 44.19$, $SD = 2.25$) compared to participants in the distraction condition ($M = 36.81$, $SD = 2.34$). In order to evaluate the potential effect of possessing a trait tendency to engage in rumination on participant's ratings of negative affect, an additional ANCOVA was conducted with RRS scores added as an additional covariate. The main effect remained significant, $F(1, 73) = 5.14$, $p > .05$, suggesting that possessing a trait tendency to ruminate did not weaken the effect of the analytical induction on participant's mood.

Discussion

The current study explored the differential effects of analytical self-focus versus distraction on the experience of naturally occurring intrusive memories. The importance of this study is underlined by the fact that it: (i) addressed the self-referent nature of intrusions, and (ii) focused on the change in the affective impact of the intrusions from pre-post manipulation. The findings indicate that inducing an analytical mode of processing resulted in participants rating their naturally occurring, self-referential intrusive memory as more negative, more distressing, and evoking a more negative emotional response compared to inducing distraction. In addition, participants in the analytical rumination condition reported worse (sad) mood relative to those in the distraction condition.

Although the adverse consequence of rumination on mood has been well-documented (see Nolen-Hoeksema et al., 2008, for a review), and recent research has

demonstrated that analytical rumination has a negative impact on variables beyond mood, such as social problem solving performance (Watkins & Moulds, 2005) and recovery from a negative failure task (Watkins, 2004), the influence of ruminative processing on the experience of intrusive memories has not previously been investigated. The findings reported here align with the suggestion that depressed individuals may get caught up in a ruminative cycle that, due to the documented effects of analytical self-focus, exacerbate the emotional response elicited by intrusions and perpetuate biased attentional focus on them. This process may be similar to that suggested by Williams, Watts, MacLeod, and Mathews (1997) in relation to normal autobiographical memories. Focussing on negative information can lead to a process of mental elaboration of the original material in a manner that creates additional pathways of retrieval leading back to the original activating event. Recent research (Donaldson, Lam, & Mathews, 2007) has documented an attentional bias for negative information in depressed individuals who have high levels of trait rumination. It may be that ruminating about negative life events in an analytical manner not only disrupts successful emotional processing, and therefore leads to intrusive memories of such events, but that the operation of an attentional bias makes the process of disengaging from rumination more difficult in depressed individuals (Donaldson et al., 2007), thus contributing to intrusion maintenance.

These suggestions could have important implications for the treatment of depression. Leading commentators (Brewin, 1998; Brewin et al., 1999; Kuyken & Brewin, 1995) have suggested that addressing intrusive memories in treatment may prove efficacious in reducing not only the occurrence of these memories, but also in reducing depressive symptomatology. One treatment possibility put forth has been the inclusion of

prolonged imaginal exposure (IE), the core component of cognitive-behaviour therapy for PTSD (see Harvey, Bryant, & Tarrier, 2003), in treatment protocols for depression. IE involves the imaginal reliving of the intrusive, traumatic experience, and is designed to facilitate emotional processing through the repeated reliving of the trauma memory in a manner that leads to affective and cognitive change (Ehlers & Clark, 2000). In the context of depression, it has been proposed that if emotional processing leads to a reduction in the frequency of intrusions, a secondary beneficial effect on mood will likely be observed (Brewin, 1998). Emotional processing is impeded by the employment of avoidant coping mechanisms and inhibitory processes that prevent experiencing negative affect and emotional distress (Rachman, 1980). By contrast, imaginal exposure encourages engagement with the emotions and distress elicited by a memory, thereby providing an adaptive response that is counter to avoidant mechanisms. Thus, encouraging emotional processing of (i.e., rather than rumination about) intrusive memories should not only help depressed clients to process such memories, but further, teach them an adaptive way of working through life events that in turn may decrease the likelihood of relapse in the event of *future* stressors.

Preliminary support for this proposal comes from a single-case design in which Kandris and Moulds (in press) investigated the effectiveness of prolonged IE in the treatment of a major depressive episode that was precipitated by a negative life event. Treatment consisted of five weekly sessions of IE in which the client focused on his two most frequent and distressing intrusive memories of an interpersonal event. Outcome results indicated that at 6-month follow-up, the client did not report intrusive memories of the break-up, and no longer met criteria for a MDE. Although the client reported that he

had experienced intermittent intrusions following the completion of treatment, when these intrusions occurred, they were not accompanied by distress (0/100). By comparison, at pre-treatment, the client rated these memories as 100/100 indicating extreme levels of distress. Levels of ruminative thinking also decreased from pre-posttreatment, even though rumination was not explicitly targeted in their intervention. This observation accords with the suggestion that techniques developed to aid in emotional processing may also be advantageous in reducing post-event rumination. Imaginal exposure may facilitate emotional processing by prompting experiential self-focus, as opposed to analytical self-focus, and therefore contribute to a reduction in intrusive memories. This possibility opens novel avenues for the treatment of depression, but awaits empirical test.

Some limitations of the current study warrant comment. First, the effects of the analytical processing induction were only documented within the period of a single research session. Future studies could usefully explore whether the observed effects of rumination on intrusion characteristics are maintained following a longer follow-up interval. This methodology would also help to address the question of whether, as postulated by some emotional processing theorists (Foa & Kozak, 1986), distraction may have a short-term ameliorative effect on negative symptoms but in fact be detrimental in the long-term. Second, we did not include an experiential/concrete induction condition. It would be beneficial for future studies to include such a condition in order to demonstrate whether the experiential and analytical modes of rumination differentially influence intrusive memory ratings. Third, the psychometric properties of the memory ratings used in the current study have not been evaluated; thus, their test-retest reliability is unknown. Finally, as our sample comprised dysphoric participants, future research using a sample

of depressed individuals would substantiate the generalizability of our findings to a clinical population.

Although research investigating intrusive memories in depression has been expanding in recent years, much remains to be known about the specific cognitive mechanisms that are associated with intrusion maintenance. The current findings highlight the need for researchers to not only attend to the occurrence of these intrusions, but also to assess their emotional impact and the specific cognitive strategies that individuals employ in response to their occurrence. Investigations of such parameters will facilitate the development of therapy techniques that will counter maladaptive avoidance responses and aid in emotional processing. Future studies could contribute to this effort by investigating how ruminative processing impacts on the encoding of negative events and on the experiential features of subsequent intrusive memories of these events.

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