

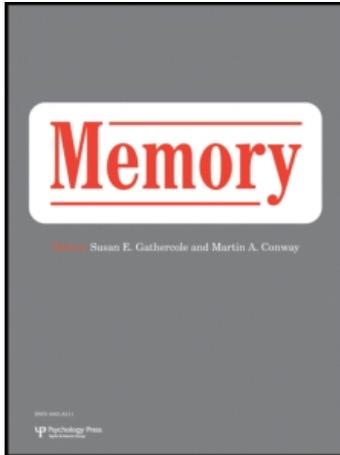
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### Intrusive memories and rumination in patients with post-traumatic stress disorder: A phenomenological comparison

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# Intrusive memories and rumination in patients with post-traumatic stress disorder: A phenomenological comparison

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The aim of the study was to investigate the phenomenological differences between intrusive memories and rumination in PTSD. The study population consisted of 31 patients with PTSD referred for cognitive behavioural therapy to specialist services. A semi-structured interview was used to examine the characteristics of the most prominent intrusive memory and rumination. Intrusive memories were predominantly sensory experiences of short duration, whereas rumination was predominantly a thought process of longer duration. Shame was associated more with rumination than with intrusive memories. Anxiety, helplessness, numbness, and threat were greater at the time of the trauma than when experiencing the intrusive memory. In contrast, feelings like anger and sadness were greater when experiencing intrusive memories than at the time of the event. The distinction between intrusive memories and rumination is of clinical importance as intrusive memories usually decrease with imaginal reliving of the trauma, whereas rumination may require different therapeutic strategies, such as rumination-focused or mindfulness-based cognitive therapy.

Recurrent and intrusive distressing recollections of the traumatic event, including images, thoughts, or perceptions, are among the key features of post-traumatic stress disorder (PTSD) (American Psychiatric Association, 1994). Research in both student and clinical populations has shown that intrusive memories of traumatic events differ in important ways from

other autobiographical memories. In students who met criteria for PTSD, Berntsen (2001) found that trauma memories were more vivid than non-traumatic memories, had more impact on current mood, and were more often accompanied by a physical reaction at retrieval. In a further study, they found that traumatic memories of students who met criteria for PTSD involved

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more emotion, smell/taste, bodily sensations, and feeling of travelling in time, and tended to involve more visual aspects and sounds, than traumatic memories of those who did not (Berntsen, Willert, & Rubin, 2003). In patients with PTSD who were assessed for treatment, Ehlers et al. (2002) also found that intrusive memories were distressing, had a vivid perceptual content, and appeared to be happening in the "here and now". With imaginal reliving of the traumatic event, the frequency, vividness, distress, andnowness of the intrusive memories gradually faded (Hackmann, Ehlers, Speckens, & Clark, 2004).

Theorists of PTSD have suggested that these intrusive memories are functionally distinct from intrusive thoughts about the trauma that do not represent re-experiencing (DeSilva & Marks, 1999; Ehlers, Hackmann, & Michael, 2004; Joseph, Williams, & Yule, 1997). The latter include evaluative thoughts about the trauma (Reynolds & Brewin, 1998, 1999) and rumination. Rumination has been defined as passively focusing one's attention on a negative emotional state like depression, its symptoms, and thinking repetitively about the causes, meanings, and consequences of that state (Nolen-Hoeksema, 1991). Rumination has been shown to predict the onset (Just & Alloy, 1997; Spasojevic & Alloy, 2001), severity (Muris, Roelofs, Rassin, Franken, & Mayer, 2005; Nolen-Hoeksema & Morrow, 1993) and maintenance of depression (Kuehner & Weber, 1999; Nolen-Hoeksema, 2000). In a recent study, Cheung, Gilbert, and Irons (2004) showed that rumination was also significantly correlated with shame, and that rumination partially mediated a link between shame and depression. Other researchers have developed a model for anger rumination (Sukhodolsky, Golub, & Cromwell, 2001) and established its negative association with forgiveness (Barber, Maltby, & Macaskill, 2005).

Apart from its importance in depressed subjects, several studies have now established the importance of rumination in subjects who experienced traumatic events. In normal subjects, Wells and Papageorgiou (1995) showed that ruminative activity following exposure to a stressor led to significantly more intrusions in the next 3 days than a settle-down control condition. Watkins (2004) demonstrated that conceptual-evaluative writing about an induced failure experience (e.g. "Why did you feel this way?") was associated with a more depressed mood and more intrusions about the failure in high trait ruminators than

experiential writing ("How did you feel moment-by-moment?"). Rumination has also been shown to be linked to subsequent depressive symptoms following negative life events such as an earthquake (Nolen-Hoeksema & Morrow, 1991) and bereavement (Nolen-Hoeksema, Parker, & Larson, 1994). In victims of road traffic accidents, rumination is one of the strongest predictors of the subsequent PTSD symptoms (Holeva, Tarrrier & Wells, 2001; Murray, Ehlers, & Mayou, 2002).

The above empirical findings of different types of emotions that are associated with intrusive memories and ruminations are in accordance with the dual representation theory of post-traumatic stress disorder of Brewin, Dalgleish, and Joseph (1996). They argued that traumatic experiences are processed in both conscious and non-conscious ways. Sensory (visual, auditory, olfactory etc.), physiological, and motor aspects of the traumatic experience are processed non-consciously and represented in situationally accessible knowledge. In contrast, autobiographical memories that are processed consciously are represented in verbally accessible knowledge. Consequently, emotional processing of traumatic events will involve different kinds of emotional reactions. First, there will be conditioned emotional reactions corresponding to the activation of specific emotional states experienced during the trauma, as represented in the person's situationally accessible memories of the event. In conjunction with these, secondary emotions such as sadness, anger, guilt, and shame, may follow from the conscious processing of the consequences and implications of the trauma.

The aim of this study was to conduct a direct comparison between intrusive memories and rumination, using the phenomenological characteristics that Hackmann et al. (2004) used in their previous research of intrusive memories of patients with PTSD. By definition and methodology, intrusive memories were expected to involve more sensory experiences, whereas rumination was expected to be more of a thought process. In accordance with the dual representation theory, we hypothesised that intrusive memories are more associated with emotions like anxiety, helplessness, numbness, and threat, and that rumination is more associated with secondary emotions such as sadness, guilt, shame, and anger. We also expected that emotions like anxiety, helplessness, numbness, and threat are less intense at the time of assessment than at the time of the trauma, but that secondary emotions like sadness, guilt,

shame, and anger may be more intense at the time of assessment than at the time of the trauma.

## METHOD

### Study population

The study population comprised patients with PTSD who had been referred for cognitive behavioural treatment to the University Department of Psychiatry, Warneford Hospital, Oxford, UK, or the Centre for Anxiety Disorders and Trauma, Maudsley Hospital, London. To be included in the study, patients had to meet the following criteria: age between 18 and 65 years; meeting diagnostic criteria for PTSD as determined by the Structured Clinical Interview for DSM-IV (First, Spitzer, Gibbon, & Williams, 1995); PTSD being the main problem; and the current episode of PTSD being due to a single event trauma. Exclusion criteria were: having been unconscious for more than 15 minutes or having no memory of the traumatic event; a history of psychosis; current alcohol or drug dependence; borderline personality disorder; severe depression needing immediate treatment in its own right (i.e., suicide risk); and the need of an interpreter to conduct assessment or treatment sessions.

The study population consisted of 15 male and 16 female subjects. Their mean age was 38.3 (*SD* 11.0) years. The majority of the patients were Caucasian ( $N = 21$ , 68%), nine (29%) were Afro-Caribbean, and one (4%) was Asian. A total of 15 (48%) of the patients were married or co-habiting, 10 (32%) were divorced, and six (19%) were single. The majority of the patients were working ( $N = 20$ , 65%), seven (23%) were on disability allowance, and two (7%) were unemployed; nine (29%) were working in professional jobs, seven (23%) in white collar, and thirteen (42%) in blue-collar jobs.

A total of 13 patients (42%) suffered from PTSD after a road traffic accident, 11 (36%) patients had been assaulted, and seven (22%) had experienced other accidents. Nine (29%) patients had a comorbid depressive disorder and nine (29%) a comorbid anxiety disorder, i.e., panic disorder ( $N = 4$ ), specific phobia ( $N = 4$ ), and social phobia ( $N = 1$ ). At the start of treatment, the mean scores on the PDS (see next section) were 32.2 (*SD* 8.6), on the BDI 23.7 (*SD* 10.3), and on the BAI 22.7 (*SD* 11.4).

## Measures

### *Post-traumatic Diagnostic Scale (PDS)*

The PDS is a self-report measure of PTSD (Foa, 1995; Foa, Cashman, Jaycox, & Perry, 1997). Patients are asked to rate how much they were bothered by each of the PTSD symptoms specified in the DSM-IV in the past month. The PDS has good internal consistency and test–retest reliability.

### *Beck Depression Inventory (BDI)*

The BDI is a 21-item self-report measure of depression that has been shown in previous research to have good reliability and validity (Beck, Ward, Mendelsohn, Mock, & Erbaugh, 1961).

### *Beck Anxiety Inventory (BAI)*

The BAI is a 21-item scale that measures the severity of self-reported anxiety (Beck & Steer, 1993). The BAI has a high internal consistency, test–retest reliability, and convergent validity.

### *Intrusion and Rumination Interview*

*Intrusion section.* This semi-structured interview was developed for the purpose of the study and was modelled after the interviews used in earlier work of Ehlers et al. (2002), Hackmann et al. (2004), and Michael (2005). The interviewer introduced the section on intrusive memories as follows:

Many people have recollections of things that happened in the trauma when they do not want them. These are usually from particular moments from before, during, or after the event that somehow “got stuck” in memory and keep coming back. For example, memories of the headlights of a car coming towards you in people who had a road traffic accident, or memories of the knife in someone who was assaulted.

The interviewer then asked whether the patient had such unwanted memories that kept coming back, and if so, whether they could describe them. The content of the memories was noted. Patients were asked to classify whether the memory was about something that happened before or during the traumatic event, or of fantasies about what might have happened

but had not. They were then asked what meaning the memory had for them, both at the time and at present. If patients reported more than one intrusive memory, they were asked to describe them all in the above manner, after which they were asked to identify which intrusive memory was troubling them most.

The interviewer then asked “Could you tell me a bit more about how you experience this most prominent memory? What is it like?” and prompted “Is it more like a thought (please describe)? ... like a feeling (please describe)? ... or like a sensory experience?”. The responses were not mutually exclusive.

If patients chose sensory experience, they were asked whether visual aspects, sounds, smells, tastes, or bodily sensations were part of the experience. If patients indicated bodily sensations were part of the experience, they were asked whether they consisted of part of the anxiety response during the trauma, part of sensations during the trauma (e.g., touch on shoulder), pain like during the trauma, or part of actions, movement, or posture during the trauma. The frequency with which the most prominent intrusive memory had occurred in the previous week was noted, and its usual duration was rated using the following categories: 1–10 seconds, 20–30 seconds, 30–60 seconds, 1–2 minutes, 2–5 minutes, 5–15 minutes, 15–60 minutes, 1–2 hours, more than 2 hours.

Patients then rated which emotions accompanied the part of the event represented by the memory at the time of the trauma, and at present, each on a scale from 0 (not at all), 1 (a little), 2 (moderately), 3 (very), to 4 (extremely). Patients were asked to indicate on a scale from 0 (never), 1 (rarely), 2 (sometimes), 3 (often), to 4 (always) how often intrusive memories were elicited by dwelling on the event.

*Rumination section.* The rumination section of the interview introduced the concept of rumination as follows:

Besides the unwanted recollections of things that happened in the trauma that we already talked about, many people cannot help repeatedly going over in their mind parts of the experience and what it meant to them. For example, they think about what could have happened or how the trauma has affected their life.

The interviewer then asked whether this happened to the patient, and if so, whether they could tell a bit more about what parts they went over, over and over again. If patients reported more than one rumination, they were asked to identify what part was most significant to them. They also rated on a 5-point scale from 0 (never) to 4 (always) how often they ruminated about a list of themes based on earlier work by Michael (2002), such as “why it happened to me” or “what else might have happened”. They indicated to what extent their ruminations concerned the past, the present, and the future. The patients were then asked about the quality, frequency, duration, and accompanying emotions of the most prominent rumination in the same way as they had been asked about the most prominent intrusive memory. They were also asked what their thoughts were like when they were dwelling on the event, and to indicate, on a scale from 0 (never) to 4 (always), to what extent they had images of the event or of the consequences of the event while they were ruminating. Finally, they were asked to indicate, on a scale from 0 (never) to 4 (always), how often rumination was elicited by intrusive memories of the event.

*Classification of the content of the intrusive memories.* Two raters independently classified the content of each memory using the following classification system that was based on the earlier work of Hackmann et al. (2004), and on further observations of the authors when treating PTSD patients.

1. Stimulus that was present shortly before the traumatic event began and signalled its onset (e.g., “Perpetrator standing by my bed with a knife” before stabbing).
2. Stimulus that occurred in the course of the event, and signalled a moment when the meaning of the event became more traumatic (e.g., “Paramedics touching my shoulder” – which preceded them asking whether the patient was all right, a moment when the patient suddenly felt pain and realised she was injured).
3. Moment before the trauma when everything still seemed OK (e.g., images of a pleasant day before the accident happened).
4. Moment when patient later wished he/she had done something differently (e.g., inter-

- action with another person after the event – patient regretted later that she had not been friendlier at the time).
5. Intrusion of elements from previous traumatic event when experiencing the present trauma (e.g., sound of previous accident in which mother was killed).
  6. Intrusion of fantasies of what might have happened, but did not.

Categories 1 and 2 both represent “warning signals”, and can be considered two examples of the same concept. They were distinguished for the purposes of the study, as the onset of the trauma can be determined more unambiguously than later time points. Interrater reliability was Kappa = .84. A consensus rating was agreed for the few cases of discrepancy between raters (all of these were between categories 1 and 2).

## Procedure

In the assessment interview, information was gathered on sociodemographic variables and the traumatic event. PTSD and comorbid psychiatric disorders were diagnosed with the Structured Clinical Interview for DSM-IV (First et al., 1995). In addition, the PDS, BDI, and BAI were administered. Patients were offered 12 sessions of cognitive behavioural treatment for PTSD. The treatment was based on the cognitive model for PTSD as described by Ehlers and Clark (2000). The Intrusion and Rumination Interview usually took place between the assessment and the first treatment session or after the first treatment session.

## Data analysis

As the distribution of the number and frequency of intrusive memories and ruminations were skewed, and the duration was assessed in categories, we chose to analyse the difference in these characteristics by means of Wilcoxon signed ranks tests. Proportions of patients who experienced intrusive memories or rumination like a thought, feeling, or sensory experience were compared by means of a chi-square test. Differences in emotions were tested by paired *t*-tests. As specific predictions were involved, the *t*-tests were one-tailed.

## RESULTS

### Phenomenology of intrusive memories and rumination

All patients had intrusive memories, and all but one patient reported ruminations. Table 1 compares the characteristics of intrusive memories and ruminations. Although the number and frequency of intrusive memories and ruminations did not differ, ruminations took significantly longer than intrusive memories ( $z = 4.56$ ,  $p < .001$ ).

As expected, the most prominent intrusive memories were more often like a sensory experience ( $z = 3.46$ ,  $p = .001$ ), while the most prominent ruminations were more often like a thought process ( $z = 4.12$ ,  $p < .001$ ). All but one patient reported intrusive memories to be like a sensory experience. Visual aspects were part of it for all of them ( $N = 24$ ), sounds for 17 (71%), smells for four (17%), and taste for three (12%). For the majority ( $N = 19$ , 79%), bodily sensations were

**TABLE 1**  
Phenomenology of most prominent intrusive memory and rumination

	<i>Intrusive memory</i>	<i>Rumination</i>	<i>p</i> value
<i>Quantitative features</i> (MD, range)			
number	3 (1–11)	3 (2–5)	0.746
frequency	3 (0–25)	4 (1–35)	0.108
duration	30–60s (1s – 15m)	5–15m (1m –2hr)	0.000
<i>Quality</i> ( $N = 25\%$ )			
like a thought	6 (24)	23 (92)	0.000
like a feeling	17 (68)	17 (68)	1.000
like a sensory experience	24 (96)	12 (48)	0.001

$N = 30$ .

part of the memory. In 17 (90%) these were like the anxiety response, in eight (42%) like actions, movement, or posture, in four (21%) like sensations, and in two (10%) like pain during the trauma.

However, 12 patients reported sensory experiences to be part of the most prominent rumination as well as the most prominent intrusive memory. For these patients, the sensory modalities involved in ruminations were very similar to those involved in intrusive memories: visual aspects were present for all, sounds were present for six (50%), and smells for one (8%). If bodily sensations were present ( $N = 5$ , 42%), they most often consisted of the anxiety response during the trauma ( $N = 4$ , 80%) and, for one patient (20%), also of sensations during the trauma.

When asked what their thoughts were like when dwelling on the event, even more of the patients reported that images of the event were often ( $N = 14$ , 45%) or always ( $N = 11$ , 36%) part of the experience. Similar proportions of the patients reported to often ( $N = 12$ , 39%) or always ( $N = 9$ , 29%) have images of the consequences of the event while dwelling on the event. In 18 (58%) of the patients, dwelling on the event was often a trigger for intrusive memories. Conversely, 22 (73%) patients reported that intrusive memories were often triggers for ruminations about the traumatic event.

With regard to the accompanying emotions, rumination was associated with greater shame than intrusive memories (see Table 2).

Table 3 compares the intensity of emotions that patients described during their traumatic experience with those they reported for their

**TABLE 2**

Associated emotions of most prominent intrusive memory and rumination

<i>Emotions</i>	<i>Intrusive memory (Mean, SD)</i>	<i>Rumination (Mean, SD)</i>	<i>t value</i>	<i>p value (one-sided)</i>
Anxiety	2.6 (1.2)	2.5 (1.2)	0.33	0.372
Anger	2.7 (1.3)	2.8 (1.2)	-0.17	0.434
Sadness	2.2 (1.4)	2.6 (1.3)	-1.69	0.051
Guilt	1.0 (1.4)	1.4 (1.6)	-1.58	0.062
Shame	0.7 (1.2)	1.2 (1.4)	-3.25	0.002
Helplessness	2.3 (1.4)	2.5 (1.3)	-0.61	0.272
Numbness	1.5 (1.5)	1.7 (1.2)	-1.23	0.114
Threat	2.0 (1.5)	2.2 (1.4)	-0.90	0.188

$N = 30$ .

**TABLE 3**

Emotions at the time of the trauma and when having intrusive memory

<i>Emotions</i>	<i>At the time of trauma (Mean, SD)</i>	<i>When having intrusive memory (Mean, SD)</i>	<i>t value</i>	<i>p value</i>
Anxiety	3.1 (1.3)	2.5 (1.3)	2.34	0.013
Anger	1.8 (1.7)	2.6 (1.4)	-2.25	0.016
Sadness	1.4 (1.6)	2.1 (1.4)	-1.92	0.032
Guilt	0.7 (1.4)	0.9 (1.3)	-0.71	0.242
Shame	0.9 (1.4)	0.6 (1.2)	1.16	0.127
Helplessness	3.1 (1.3)	2.2 (1.5)	3.02	0.002
Numbness	2.0 (1.6)	1.3 (1.4)	2.61	0.007
Threat	3.1 (1.4)	1.9 (1.5)	3.11	0.002

$N = 30$ .

most prominent intrusive memory. Anxiety, helplessness, numbness, and perceived threat were stronger at the time of the traumatic event than when having the intrusive memory. In contrast, anger and sadness were stronger when having the intrusive memory than at the time of the trauma.

### Content of intrusive memories and rumination

The classification of the content of the main intrusive memory and all intrusive memories together is shown in Table 4. The majority (90%) of the main intrusive memories and all intrusive memories (84%) were classified as warning signals that signalled either the onset of the trauma or the beginning of a moment when the meaning became more traumatic. One pa-

**TABLE 4**

Classification of intrusive memories

	<i>Main intrusive memory (N=31) N (%)</i>	<i>All intrusive memories (N=97) N (%)</i>
Warning signal of onset	14 (45)	25 (26)
Warning signal of more traumatic meaning	14 (45)	56 (58)
Everything still OK		2 (2)
Done something differently	1 (3)	3 (3)
Earlier trauma	1 (3)	7 (7)
Fantasies of what might have happened	1 (3)	4 (4)

**TABLE 5**  
Themes of rumination

	<i>Mean (SD)</i>
About the long-term consequences of the event	3.3 (0.9)
What life would be like if the event had not happened	3.0 (1.2)
About what else might have happened	2.7 (1.1)
How unfair it is	2.4 (1.5)
About my relationship to other people	2.3 (1.3)
How things would have been, if only I had done something differently	2.2 (1.6)
About why it happened to me	2.1 (1.5)
About what I would like to say or do to the person who caused the trauma	2.1 (1.4)
About other bad things that may happen in the future	2.1 (1.3)
Things that I do not understand	2.1 (1.3)
About the kind of person I am	1.9 (1.4)
Things I cannot remember	1.5 (1.4)

*N* = 30.

tient, for example, had intrusive memories of his mouth being cut with a knife and the taste of blood, and the sound of his wrist being broken and the pain. At the time of the attack, at both these moments the patient thought that he would be killed and that his wife and children would be killed.

With regard to rumination, patients appeared to ruminate most often about the past (*N* = 22, 73%), and slightly less often about the future (*N* = 18, 60%) or the present (*N* = 15, 50%). The patient mentioned above, for example, ruminated about why the attack had happened, about how it had affected his life, and about the fact that he had to protect his wife and children from something bad happening to them. Table 5 shows the frequency with which patients ruminated about the range of themes provided to them. The most important themes were the long-term consequences of the traumatic event, what life would be like if the event had not happened, what else might have happened, how unfair it was, and the patient's relationship to other people.

## DISCUSSION

### Characteristics of intrusive memories and rumination

As expected, the most prominent intrusive memories and rumination appeared to be phenome-

nologically different. Intrusive memories were predominantly sensory experiences, whereas rumination was mainly described as a thought process. Intrusive memories were mostly of short duration, less than a minute, as opposed to rumination, which could take hours.

In the light of the definitions and examples that participants were supplied with, it is striking that almost half of the group reported the predominant rumination to be like a sensory experience as well. In fact, when asked what their thoughts were like when dwelling on the event, the majority of the patients indicated that they often had images of the event itself or of the consequences of the event. Part of the explanation for the high prevalence of sensory experiences while ruminating might be that intrusive memories and rumination take place simultaneously. In a high proportion of patients, intrusive memories triggered rumination and vice versa. However, as rumination is often assumed to be a verbal process, imagery might also be an underestimated and understudied part of the ruminative process.

### Emotional reactions

In accordance with our hypothesis, shame was associated more with rumination than with intrusive memories, and sadness and guilt tended to be so, although these differences did not reach significance.

Feelings such as anxiety, helplessness, numbness, and threat were reported to be stronger at the time of the trauma than at the time of the assessment. In contrast, feelings like anger and sadness were greater at the time of assessment than at the time of the trauma. This is in accordance with the dual representation theory of post-traumatic disorder, which suggests that some emotions (such as fear) tend to be most intense during the trauma, whereas secondary emotions (such as anger) tend to be more intense post-trauma.

Rumination might be an important mediating factor between the traumatic event, the increase of feelings like sadness, shame, and anger, and the subsequent onset or maintenance of PTSD symptoms. This is in accordance with the study of Cheung et al. (2004), who also showed that rumination was correlated with shame, and that rumination partially mediated a link between shame and depression.

## Limitations of the study

Obviously, the definitions and examples of intrusive memories and rumination provided to the patients may partly account for the difference in the sensory versus verbal ratings between the two types of thinking. In addition, the study sample was relatively small and non-consecutive in nature. Both of these were determined by the availability of an experienced clinician (AS), who conducted most of the interviews. Furthermore, the lack of a comparison or control group makes it difficult to judge whether the nature of intrusive memories and rumination observed here is specific to PTSD, or might apply to other populations as well.

## Clinical implications

The distinction between intrusive memories and rumination may have important clinical implications. Reliving of traumatic memories and cognitive restructuring of appraisals and beliefs emerging from trauma experiences have demonstrated to be effective in reducing the frequency and associated distress of intrusive memories (Hackmann et al., 2004).

However, rumination might require additional therapeutic interventions. In a preliminary study, Wells and Sembi (2004) described a new brief treatment for PTSD—metacognitive therapy, involving elements such as analysing the advantages and disadvantages of rumination, and training patients to respond to their symptoms by acknowledging that the symptoms are occurring and reminding themselves that ruminating about them is unhelpful.

In a recent study, Ramel, Goldin, Carmona, and McQuaid (2004) reported on the effects of mindfulness-based stress reduction on rumination. Mindfulness is defined as “paying attention in a particular way: on purpose, in the present moment, and non-judgmentally” (Kabat-Zinn, 1994, p. 4), which has similarities to the experiential mode of self-focused attention that Watkins (2004) showed to be adaptive in emotional processing of upsetting events. Mindfulness-based cognitive therapy has been shown to be effective in preventing relapse in patients with recurrent depression in two separate randomised controlled trials (Ma & Teasdale, 2004; Teasdale et al., 2000). The results of Ramel et al. (2004) suggested that

mindfulness practice primarily led to decrease in ruminative thinking, even after controlling for reductions in affective symptoms. This might make mindfulness-based interventions an interesting new approach, also for patients with PTSD in whom rumination plays an important role.

## REFERENCES

- American Psychiatric Association. (1994). *Diagnostic and Statistical Manual of Mental Disorders (4th ed.) (DSM-IV)*. Washington, DC: American Psychiatric Association.
- Barber, L., Maltby, J., & Macaskill, A. (2005). Angry memories and thoughts of revenge: The relationship between forgiveness and anger rumination. *Personality and Individual Differences, 39*, 253–262.
- Beck, A. T., & Steer, R. A. (1993). *Beck Anxiety Inventory: Manual*. San Antonio, TX: The Psychological Corporation.
- Beck, A. T., Ward, D. H., Mendelsohn, M., Mock, J., & Erbaugh, J. (1961). An inventory for measuring depression. *Archives of General Psychiatry, 4*, 561–571.
- Berntsen, D. (2001). Involuntary memories of emotional events: Do memories of traumas and extremely happy events differ? *Applied Cognitive Psychology, 15*, S135–S158.
- Berntsen, D., Willert, M., & Rubin, D.C. (2003). Splintered memories or vivid landmarks? Qualities and organization of traumatic memories with and without PTSD. *Applied Cognitive Psychology, 17*, 675–683.
- Brewin, C. R., Dalgleish, T., & Joseph, S. (1996). A dual representation theory of post-traumatic stress disorder. *Psychological Review, 103*, 670–686.
- Cheung, M. S. P., Gilbert, P., & Irons, C. (2004). An exploration of shame, social rank and rumination in relation to depression. *Personality and Individual Differences, 36*, 1143–1153.
- DeSilva, P., & Marks, M. (1999). Intrusive thinking in post-traumatic stress disorders. In W. Yule (Ed.), *Post-traumatic stress disorder: Concepts and therapy* (pp. 161–175). New York: Wiley.
- Ehlers, A., & Clark, D. M. (2000). A cognitive model of post-traumatic stress disorder. *Behaviour Research and Therapy, 38*, 319–345.
- Ehlers, A., Hackmann, A., & Michael, T. (2004). Intrusive re-experiencing in post-traumatic stress disorder: Phenomenology, theory, and therapy. *Memory, 12*, 403–415.
- Ehlers, A., Hackmann, A., Steil, R., Clohessy, S., Wenninger, K., & Winter, H. (2002). The nature of intrusive memories after trauma: The warning signal hypothesis. *Behaviour Research and Therapy, 40*, 1021–1028.
- First, M. B., Spitzer, R. L., Gibbon, M., & Williams, J. B. W. (1995). *Structured Clinical Interview for DSM-IV Axis I Disorders – Patient Edition (SCID-I/*

- P, Version 2.0*). New York: New York State Psychiatric Institute.
- Foa, E. B. (1995). *The Post-traumatic Diagnostic Scale (PDS) manual*. Minneapolis, MN: National Computer Systems.
- Foa, E. B., Cashman, L., Jaycox, L. H., & Perry, K. (1997). The validation of a self-report measure of PTSD: The PTSD Diagnostic Scale (PDS). *Psychological Assessment, 9*, 445–451.
- Hackmann, A., Ehlers, A., Speckens, A., & Clark, D. M. (2004). Characteristics and content of intrusive memories in PTSD and their changes with treatment. *Journal of Traumatic Stress, 17*, 231–240.
- Holeva, V., Tarrier, N., & Wells, A. (2001). Prevalence and predictors of acute stress disorder and PTSD following road traffic accidents: Thought control strategies and social support. *Behavior Therapy, 32*, 65–83.
- Joseph, S., Williams, R., & Yule, W. (1997). *Understanding post-traumatic stress. A psychosocial perspective on PTSD and treatment*. Chichester, UK: Wiley.
- Just, N., & Alloy, L. B. (1997). The response styles theory of depression: Tests and an extension of the theory. *Journal of Abnormal Psychology, 106*, 221–229.
- Kabat-Zinn, J. (1994). *Wherever you go, there you are*. New York: Hyperion.
- Kuehner, C., & Weber, I. (1999). Responses to depression in unipolar depressed patients: An investigation of Nolen Hoeksema's response styles theory. *Psychological Medicine, 29*, 1323–1333.
- Ma, S. H., & Teasdale, J. D. (2004). Mindfulness-based cognitive therapy for depression: Replication and exploration of differential relapse prevention effects. *Journal of Consulting and Clinical Psychology, 72*, 31–40.
- Michael, T. (2000). *The nature of trauma memory and intrusive cognitions in post-traumatic stress disorder*. D.Phil. thesis, Oxford University, UK.
- Muris, P., Roelofs, J., Rassin, E., Franken, I., & Mayer, B. (2005). Mediating effects of rumination and worry on the links between neuroticism, anxiety and depression. *Personality and Individual Differences, 39*, 1105–1111.
- Murray, J., Ehlers, A., & Mayou, R. A. (2002). Dissociation and post-traumatic stress disorder: Two prospective studies of motor vehicle accident survivors. *British Journal of Psychiatry, 180*, 363–368.
- Nolen-Hoeksema, S. (1991). Responses to depression and their effects on the duration of depressive episodes. *Journal of Abnormal Psychology, 100*, 569–582.
- Nolen-Hoeksema, S. (2000). The role of rumination in depressive disorders and mixed anxiety/depressive symptoms. *Journal of Abnormal Psychology, 109*, 504–511.
- Nolen-Hoeksema, S., & Morrow, J. (1991). A prospective study of depression and post-traumatic stress symptoms after a natural disaster: The 1989 Loma Prieta earthquake. *Journal of Personality and Social Psychology, 61*, 115–121.
- Nolen-Hoeksema, S., & Morrow, J. (1993). Effects of rumination and distraction on naturally occurring depressed mood. *Cognition and Emotion, 7*, 561–570.
- Nolen-Hoeksema, S., Parker, L. E., & Larson, J. (1994). Ruminative coping with depressed mood following loss. *Journal of Personality and Social Psychology, 67*, 92–104.
- Ramel, W., Goldin, P. R., Carmona, P. E., & McQuaid, J. R. (2004). The effects of mindfulness meditation on cognitive processes and affect in patients with past depression. *Cognitive Therapy and Research, 28*, 433–455.
- Reynolds, M., & Brewin, C. R. (1998). Intrusive cognitions, coping strategies and emotional responses in depression, post-traumatic stress disorder and a non-clinical population. *Behaviour Research and Therapy, 36*, 135–147.
- Reynolds, M., & Brewin, C. R. (1999). Intrusive memories in depression and post-traumatic stress disorder. *Behaviour Research and Therapy, 37*, 201–215.
- Spasojevic, J., & Alloy, L. B. (2001). Rumination as a common mechanism relating depressive risk factors to depression. *Emotion, 1*, 25–37.
- Sukhodolsky, D. G., Golub, A., & Cromwell, E. N. (2001). Development and validation of the anger rumination scale. *Personality and Individual Differences, 31*, 689–700.
- Teasdale, J. D., Segal, Z. V., Williams, J. M. G., Ridgeway, V. A., Soulsby, J. M., & Lau, M. A. (2000). Prevention of relapse/recurrence in major depression by mindfulness-based cognitive therapy. *Journal of Consulting and Clinical Psychology, 64*, 615–623.
- Watkins, E. (2004). Adaptive and maladaptive ruminative self-focus during emotional processing. *Behaviour Research and Therapy, 42*, 1037–1052.
- Wells, A., & Papageorgiou, C. (1995). Worry and the incubation of intrusive images following stress. *Behaviour Research and Therapy, 33*, 579–583.
- Wells, A., & Sembi, S. (2004). Metacognitive therapy for PTSD: A preliminary investigation of a new brief treatment. *Journal of Behavior Therapy and Experimental Psychiatry, 35*, 307–318.