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Decentring and distraction reduce overgeneral autobiographical memory in depression

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ABSTRACT

Background. Increased recall of categorical autobiographical memories is a phenomenon unique to depression and post-traumatic stress disorder, and is associated with a poor prognosis for depression. Although the elevated recall of categorical memories does not change on remission from depression, recent findings suggest that overgeneral memory may be reduced by cognitive interventions and maintained by rumination. This study tested whether cognitive manipulations could influence the recall of categorical memories in dysphoric participants.

Methods. Forty-eight dysphoric and depressed participants were randomly allocated to rumination or distraction conditions. Before and after the manipulation, participants completed the Autobiographical Memory Test, a standard measure of overgeneral memory. Participants were then randomized to either a 'decentring' question (Socratic questions designed to facilitate viewing moods within a wider perspective) or a control question condition, before completing the Autobiographical Memory Test again.

Results. Distraction produced significantly greater decreases in the proportion of memories retrieved that were categorical than rumination. Decentring questions produced significantly greater decreases in the proportion of memories retrieved that were categorical than control questions, with this effect independent of the prior manipulation.

Conclusions. Elevated categorical memory in depression is more modifiable than has been previously assumed; it may reflect the dynamic maintenance of a cognitive style that can be interrupted by brief cognitive interventions.

INTRODUCTION

A body of evidence has accumulated (reviewed in Williams, 1996) suggesting that depressed people find it difficult to recall specific autobiographical memories. When asked to recall specific autobiographical memories to positive and negative cue words, parasuicidal patients (Williams & Broadbent, 1986; Williams & Dritschel, 1988) and depressed patients (Williams & Scott, 1988; Kuyken & Brewin, 1995; Kuyken & Dalgleish, 1995) retrieve significantly fewer specific memories and more overgeneral memories than non-depressed controls. Overgeneral memories were defined by Williams & Dritschel (1992) as either being categorical (a summary of repeated memories, e.g. waiting at bus stops, making mistakes) or extended (taking place over a period longer than one day, e.g. on holiday in France). Further research has determined that depressed participants differ from control group participants in their tendency to produce more categorical memories but not extended memories (Williams & Dritschel, 1992; Goddard *et al*. 1996).

Importantly, increased recall of overgeneral autobiographical memories is a process that appears unique to depression and post-traumatic stress disorder (McNally *et al*. 1994, 1995). Elevated recall of overgeneral memories has not been found in anxious subjects (Richards &

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Whittaker, 1990), generalized anxiety disorder patients (Bruke & Mathews, 1992) or social phobic patients (Rapee *et al.* 1994). Furthermore, research suggests that overgeneral memory retrieval in depression maybe of some clinical relevance. In a longitudinal study of depressed patients, Brittlebank *et al.* (1993) found that high levels of overgeneral memory were associated with poor prognosis for depression. Furthermore, patients who have difficulty in recalling specific memories are impaired at interpersonal problem solving (Evans *et al.* 1992; Goddard *et al.* 1996; Sidley *et al.* 1997).

Considering the association between overgeneral memory retrieval and both prognosis and problem solving in depression, demonstrating that a particular intervention could reduce overgeneral memory in depression would be of some consequence. Previous studies have suggested that overgeneral memory is a relatively stable process, not influenced by changes in mood or by pharmacological intervention. Williams & Dritschel (1988) found no significant difference in recall of specific memories between suicidal and recovered patients in a cross-sectional study, although both groups recalled significantly fewer specific memories than never-depressed controls. Brittlebank *et al.* (1993) found no significant change in overgeneral memory to positive and negative cues upon remission from depression (prinicipally after pharmacological treatment) in a longitudinal study.

However, the impact of cognitive interventions on overgeneral memory in depression was not tested in these studies. It is possible that psychological therapies that focus on discussing specific events may be more likely to reduce overgeneral memory recall than antidepressant medication. Williams *et al.* (2000) reported that mindfulness-based cognitive therapy significantly reduced the recall of categorical memories in remitted depressed patients, compared to a treatment as usual condition. Mindfulness-based cognitive therapy is a relapse prevention treatment, teaching meditative approaches as well as standard cognitive therapy skills. This finding suggests that cognitive interventions may influence overgeneral memory retrieval.

In a pilot study (Watkins, 1999) designed to investigate the effect of a decentring induction (Watkins *et al.* 2000) on the hedonic tone of recalled autobiographical memories, there was a reduction in the overgenerality of memories recalled by dysphoric participants. The decentring induction consisted of Socratic questions like those used in cognitive therapy to challenge negative thoughts. In particular, we designed questions to increase awareness of the transience of moods (e.g. 'How long does any mood last?'). We hypothesized that the decentring questions would increase awareness of the transience of mood states in order to challenge attributions that characterize depressed mood as permanent and characteristic of the self. Since these attributions have been implicated in the maintenance and exacerbation of depression (Abramson *et al.* 1978; Teasdale & Barnard, 1993) reducing them should hasten recovery from a sad mood. Consistent with these hypotheses, Watkins *et al.* (2000) found that a significantly greater proportion of participants in a decentring group than a control group demonstrated recovery from an induced negative mood and reported shifts in perspective concerning mood states.

The observed reduction in overgeneral memory following decentring prompts (Watkins, 1999), further suggested that cognitive interventions might manipulate the retrieval of overgeneral memories. Watkins' (1999) finding was serendipitous and did not use the standard overgeneral memory paradigm (Autobiographical Memory Test (AMT), Brittlebank *et al.* 1993; Williams, 1995). Furthermore, the design of the study involved participants ruminating for 8 min (Nolen-Hoeksema & Morrow, 1993) before random allocation to decentring questions or control questions, in order to maximize any existing negative thoughts and feelings. Rumination involves focusing attention on the self, current symptoms of the depressed mood and on the causes, consequences and meaning of the current mood. It is possible that the reduction in overgeneral memory was the result of an interaction between rumination and decentring/control questions rather than a main effect of decentring *v.* control questions.

The present study was a more systematic test of whether experimental cognitive manipulations could influence overgeneral memory. As well as attempting to replicate the effect of the decentring manipulation on overgeneral memory, the distraction and rumination tasks devised

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by Nolen-Hoeksema & Morrow (1993) were used. Distraction involves focusing attention on mental images unrelated to mood or self. The distraction task was a control task for rumination; we did not use a no-activity control task since the dysphoric sample was likely to have a high natural level of rumination. The use of both distraction and rumination tasks prior to decentring and control prompts allowed a test of whether the decentring effect on overgeneral memory would only occur when preceded by the rumination task.

A direct comparison of the effects of rumination *v.* distraction on overgeneral memory would also be interesting since Williams (1996, p. 261) proposed that the over-elaboration of categorical memories is 'encouraged by and itself encouraging ruminative self-focus'. Williams hypothesized that ruminative self-focus may reduce working memory capacity and therefore limit the resources available to shift processing away from the default mode of categorical memory retrieval. Consistent with this hypothesis, Singer & Moffitt (1992) found that when undergraduates were asked to recall a specific memory that 'helps you understand yourself as an individual', more overgeneral memories were recalled, compared to students given standard recall instructions. Focusing on the self and trying to understand the self are two aspects of Nolen-Hoeksema's (1991) concept of rumination. This finding suggests that rumination may increase overgeneral memory recall in non-depressed subjects.

Previous studies of overgeneral memory have focused on the proportion of the memories recalled that were general (Williams & Broadbent, 1986; Brittlebank *et al.* 1993) or specific (Williams & Scott, 1988). We used the proportion of memories recalled that were categorical as the principal measure of overgeneral memory because overgeneral memory in depression depends on categoric memories rather than extended memories (Williams & Dritschel, 1992; Goddard *et al.* 1996).

In summary, the present study investigated the hypothesis that overgeneral memory retrieval in depression is an aspect of information processing that is influenced by the cognitive state of the person retrieving the memory, rather than an unmodifiable style. Our first prediction was that, replicating the findings of Watkins (1999), decentring prompts would produce a significant reduction in overgeneral retrieval, relative to control prompts and that this effect would be independent of the preceding manipulation, whether distraction or rumination. Watkins (1999) found no effect of the decentring prompts on dysphoric mood in people with spontaneously occurring dysphoria; therefore, we expected the decentring intervention to have no effect on mood. Our third prediction, based on previous studies by Nolen-Hoeksema and colleagues was that the rumination task would maintain or increase dysphoric mood while the distraction task would reduce dysphoric mood. Our fourth prediction was that distraction would reduce overgeneral retrieval, relative to rumination.

METHOD

Participants

Forty-eight volunteers (16 males, 32 females, average age = 39·5 years, S.D. = 12·1 years) were recruited by press advertisements asking for volunteers who experienced frequent sad moods. All met the criteria of age 18–65 and a Beck Depression Inventory (BDI; Beck *et al.* 1961) score > 14 at testing. Of the volunteers, 54% met criteria for current major depressive disorder, 75% met criteria for past major depressive disorder and 17% met criteria for dysthymia on the Structured Clinical Interview for Diagnosis (SCID; Spitzer *et al.* 1990), using DSM-III-R (American Psychiatric Association, 1987) criteria. The mean BDI score of the participants studied was 24·4 (S.D. = 8·1).

Materials

Self-report measures

Participants rated their mood on two 0–100 scales ranging from 0 (I do not feel at all X) to 100 (I feel extremely X), where X was 'happy' and 'despondent' respectively (Teasdale *et al.* 1980).

Distraction and rumination

The distraction and rumination tasks were adapted from the tasks used by Nolen-Hoeksema & Morrow (1993), with items adjusted for British participants. In the rumination condition, participants focused their

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Table 1. *Details of decentring and control prompts*

Decentring prompts	Control prompts
What different views do I have of myself?	What different photos do I have myself?
How long does this feeling last?	How long does this weather last?
What will I think about this in ten years time?	What will I buy with this ten pounds?
How long does any mood last?	How long does any weather last?
How does this one moment fit into my whole life?	How does this one sofa fit into my whole house?
Have all my past feelings changed with time?	Have all my skills improved with practise?
Don't I have both good and bad times?	Don't businesses have both good and bad times?
How important will this moment appear from my deathbed?	How good will this view look from my window?
What fraction of me is how I feel now?	What fraction of my life do I spend asleep?

attention on items that were symptom-focused, emotion-focused and self-focused, e.g. 'Think about what your feelings might mean' and 'Think about the possible consequences of the way you feel'. In the distraction condition, participants focused their attention on items that were externally focused, e.g. 'Think about the shape of a large black umbrella' and 'Think about a raindrop sliding down a pane of glass'. In each condition, participants concentrated on 45 items for a total of 8 min.

Decentring v. *control prompt task*

Participants randomly received either the decentring or control versions of the task. The active component of the decentring induction was nine Socratic questions reminding participants of the transience of mood states, each of which was scrambled with one word added, as used by Watkins *et al.* (2000). For each sentence the added word was a synonym for a word in the original sentence, e.g. 'How long does any mood last?' was converted to 'mood long does any *stay* last how?' (added word in italics). The control version replaced the nine decentring prompts with nine scrambled control prompts, e.g. 'Have all my skills improved with practise?' was converted to 'all my skills improved with practise have *increased*?'. Nine extra neutral statements were scrambled, e.g. 'Paris is the capital of France' was converted to 'Paris capital *centre* of is the France', and interspersed among both the scrambled decentring or control prompts. These neutral statements were filler statements designed to make the theme of the decentring questions less obvious. Participants unscrambled the sets of words into meaningful sentences, which they wrote down and read aloud. We used the scrambled sentence task to ensure that participants processed the meaning of the questions, (i.e. during the unscrambling) without any explicit instructions to alter their perspective towards mood states. The task was not time limited and participants did not explicitly answer the questions during the task. Thus, the task tested the effectiveness of Socratic questions to influence mood and cognition, while minimizing demand characteristics. Previous demonstrations that the decentring questions altered recovery from induced depressed mood (Watkins *et al.* 2000) and influenced memory recall (Watkins, 1999), suggest an implicit effect of the prompts on cognition and emotion. Table 1 contains the complete list of (unscrambled) decentring and control prompts.

Autobiographical Memory Test (*AMT*)

This task was the test described by Williams (1995). Participants were given 30 s to recall a specific personal memory to each of six positive words (e.g. happy), six negative words (e.g. failure) and six neutral words (e.g. bread). A memory was coded on the specificity of the subject's first memory response; as specific if it occurred at a particular place and time and lasted less time than a day, as categorical if it was a summary of repeated events and as extended if it lasted longer than a day. If there was no memory response in 30 s, we coded this as an omission. Three parallel forms, matched for emotionality and frequency of words were counterbalanced within each group for time of measurement. The prompt 'Can you think of a particular time?' was used for ambiguous responses. The instructions and cue words were administered by tape recorder. Comparison of the experimenter's categorizations with two blind raters showed that specific and categorical memories could be reliably distinguished (inter-

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rater agreement on a random sample of 8% of memories ($N = 210$) was, respectively, 93·8% and 86·4%, $\kappa = 0{\cdot}86$ and $\kappa = 0{\cdot}72$ (Cohen, 1968) controlling for agreement due to chance).

Design

Participants were randomly allocated to four groups; a rumination-then-control group; rumination-then-decentring group; distraction-then-control group; distraction-then-decentring group. The overall design was a 2 (first intervention; rumination *v.* distraction) × 2 (second intervention: decentring *v.* control) mixed factors repeated measures (Time 1 *v.* Time 2 *v.* Time 3) design. The groups were matched for gender (eight women and four men in each group).

Procedure

Participants gave written informed consent and then completed the BDI and SCID. Participants were told that the study was investigating performance on reasoning tasks. All participants completed one form of the AMT and self-report measures of mood (Time 1) and then randomly received either the rumination or distraction conditions. Participants then completed the AMT and self-report measures of mood again (Time 2). Since the AMT was quite time-consuming, a 2 min version of the distraction or rumination task was repeated as a booster after the second AMT, to reactivate that style of processing prior to the decentring or control tasks. Participants then randomly received either the decentring or control prompt conditions, before completing a third form of the AMT and a third self-report of mood (Time 3). Participants then rated the valence of the specific autobiographical memories they had recalled. Participants completed a post-experiment questionnaire, asking about their experience of the experiment. Finally, participants were debriefed, thanked and paid.

RESULTS

The different types of memory response were examined as a proportion of the number of memories retrieved (i.e. excluding omissions). All analyses were initially performed with sex of participant as a between-subjects' factor. There were no significant main effects or interactions with sex of participant; therefore, all analyses reported were conducted by collapsing across sex of participant. An alpha level of 0·05 was used for all statistical tests. Table 2 shows the means and standard deviations for the mood measures and for the proportion of memories recalled that were categorical and specific for all four groups at all three times of measurement. Fig. 1 displays the pattern of changes in recall of categorical memories. There were too few extended memories for meaningful statistical analyses (less than 2·5% of the total of possible memory responses).

Testing response styles: rumination *v.* distraction

The two rumination groups were pooled and the two distraction groups were pooled to form respectively a rumination condition and a distraction condition, which could be directly compared. The pooling of the rumination and distraction groups was possible because the rumination and distraction manipulations occurred before the decentring and control prompt manipulation, so the decentring or control prompts could not influence the response to rumination or distraction.

Background variables

Univariate analyses of variance (ANOVAs) and chi-squared analyses found no significant difference between the rumination and distraction conditions for any measures or characteristics.

Mood measures

To test the prediction that rumination would increase or maintain depressed mood and distraction would reduce depressed mood, 2 (First intervention: rumination *v.* distraction) × 2 (Time: Time 1 *v.* Time 2) repeated measures ANOVAs were calculated. Nearly significant First intervention × Time interactions were found for despondency, $F(1, 46) = 3{\cdot}38$, $P = 0{\cdot}072$ and for happiness, $F(1, 46) = 3{\cdot}46$, $P = 0{\cdot}069$. Although not significant at the 0·05 level, these results were in a direction consistent with previous findings in dysphoric undergraduates (Nolen-Hoeksema & Morrow, 1993) that distraction would reduce dysphoric mood while rumination would maintain dysphoric mood. There was a significant main effect of Time on

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Table 2. *Means and standard deviations (in parentheses) for proportions of memories recalled that were categorical and for mood ratings*

	Group			
Time/variable	Rumination-decentring Mean (S.D.)	Rumination-control Mean (S.D.)	Distraction-control Mean (S.D.)	Distraction-decentring Mean (S.D.)
Time 1: baseline				
Despondency	50·0 (23·6)	53·3 (23·8)	58·7 (19·8)	65·0 (17·4)
Happiness	35·4 (17·9)	45·0 (20·8)	32·9 (15·6)	32·9 (18·6)
Specific	0·71 (0·23)	0·72 (0·22)	0·72 (0·24)	0·59 (0·14)
Categorical	0·23 (0·21)	0·26 (0·23)	0·25 (0·25)	0·37 (0·17)
Time 2: post-first manipulation				
Despondency	53·7 (23·4)	44·8 (27·9)	42·9 (21·4)	52·5 (23·1)
Happiness	39·2 (23·8)	44·2 (20·6)	44·6 (20·3)	44·2 (17·4)
Specific	0·69 (0·26)	0·71 (0·23)	0·80 (0·17)	0·75 (0·15)
Categorical	0·13 (0·26)	0·27 (0·23)	0·17 (0·16)	0·21 (0·14)
Time 3: post-second manipulation				
Despondency	45·0 (19·5)	41·7 (25·6)	39·6 (21·9)	54·2 (29·1)
Happiness	45·4 (21·9)	47·1 (16·4)	43·7 (20·9)	44·6 (22·9)
Specific	0·81 (0·24)	0·70 (0·22)	0·81 (0·14)	0·84 (0·14)
Categorical	0·17 (0·23)	0·28 (0·21)	0·15 (0·13)	0·12 (0·13)

Despondency, is the self-report of despondency on a 0–100 Visual Analogue Scale. Happiness, is the self-report of despondency on a 0–100 Visual Analogue Scale. Specific, is the proportion of memories recalled that were specific. Categorical, is the proportion of memories recalled that were categorical.

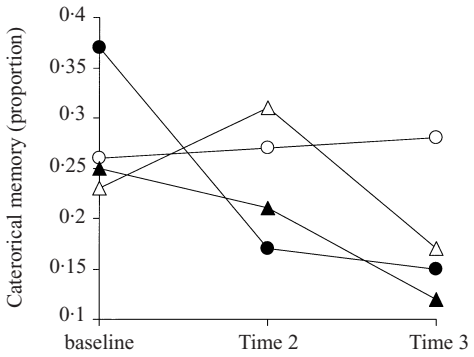


FIG. 1. The proportions of memories recalled that were categorical at each point of measurement for all four experimental groups (△, rumination then decentring; ○, rumination then control; ▲, distraction then decentring; and ●, distraction then control).

despondency, $F(1, 46) = 6{\cdot}66$, $P < 0{\cdot}015$ and on happiness, $F(1, 46) = 5{\cdot}77$, $P < 0{\cdot}03$. Both groups tended to improve mood from Time 1 to Time 2.

Autobiographical Memory Test

To test the prediction that rumination would increase overgeneral memory recall relative to distraction, a repeated measures 2 (First intervention: rumination *v.* distraction) × 2 (Time: Time 1 *v.* Time 2) ANOVA examined the proportions of memories recalled that were categoric and specific.[1] There was a significant interaction of First intervention × Time for the proportion of categorical memories, $F(1, 46) = 11{\cdot}36$, $P < 0{\cdot}005$ and for the proportion of specific memories, $F(1, 46) = 8{\cdot}7$, $P < 0{\cdot}01$. This interaction reflected a decrease in the proportion of categorical memories from Time 1 to Time 2 in the distraction group but not in the rumination group (see Table 2 and Fig. 1). There were no other significant main effects or interactions.

To check that the change in the overgenerality of autobiographical memories was not the result of change in mood state, the ANOVA was repeated, with the change in despondency from Time 1 to Time 2 as a covariate. The First intervention × Time interaction was still significant for categorical memories, $F(1, 45) = 8{\cdot}68$, $P < 0{\cdot}006$ when mood was covaried out.

This finding is consistent with previous suggestions that overgeneral memory is independent of mood state (Williams & Dritschel, 1988; Brittlebank *et al*. 1993).

A repeated measures 2 (First intervention: rumination *v.* distraction) × 2 (Time: Time 1 *v.*

[1] Initial analyses of the proportion of memories recalled that were categorical included the Valence of the cue words as a factor. However, since there was no interaction of Valence with either the First intervention of the Second intervention on the proportion of categorical memories recalled, the reported analyses do not include Valence as a factor.

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Time 2) ANOVA for the number of omissions (times when no memory recalled) found no significant main effects or interactions.

Testing the decentring effect

In order to test whether the effect of decentring prompts *v.* control prompts on overgeneral memory was dependent upon the preceding manipulation, 2 (First intervention: rumination *v.* distraction) × 2 (Second intervention: decentring *v.* control) repeated measures ANOVAs were calculated.

Background variables

Univariate analyses of variance (ANOVAs) and chi-squared analyses found no significant difference between the decentring and control conditions for any measures or characteristics.

Mood measures

The 2 (First intervention: rumination *v.* distraction) × 2 (Second intervention: decentring *v.* control) × 2 (Time: Time 2 *v.* Time 3) repeated measures ANOVAs were calculated for despondency and happiness. There were no significant main effects or interactions of either the First or Second intervention, or of Time for either despondency or happiness (see Table 2).

Autobiographical Memory Test

To examine whether the general nature of autobiographical memory recall was influenced by decentring, independently of prior manipulations, a repeated measures 2 (First intervention: rumination *v.* control) × 2 (Second intervention: decentring *v.* control) × 2 (Time: Time 2 *v.* Time 3) ANOVA was calculated for the proportion of memories that were categorical and specific. There was a significant main effect of Time for categorical memories, $F(1, 44) = 10{\cdot}62$, $P < 0{\cdot}005$ and for specific memories, $F(1, 44) = 8{\cdot}26$, $P < 0{\cdot}01$. However, this effect was qualified by a significant interaction of the Second intervention × Time, for categorical memories, $F(1, 44) = 9{\cdot}48$, $P < 0{\cdot}005$ and for specific memories, $F(1, 44) = 7{\cdot}52$, $P < 0{\cdot}01$. This interaction reflected a significantly greater reduction in the proportion of categorical memories recalled from Time 2 to Time 3 in the decentring group than in the control group (see Table 2). There were no significant interactions of the First intervention × Time and no significant interactions of the First × Second interventions × Time, (Fs < 1 for all interactions).

However, it was possible that the impact of distraction and rumination on baseline scores (i.e. the change from Time 1 to Time 2) might differentially affect the responses to decentring and control prompts (i.e. the change from Time 2 to Time 3). To control for this, the analysis was repeated with the change in the proportion of categorical memories from Time 1 to Time 2 as a covariate. There was still a significant interaction of the Second intervention × Time, $F(1, 43) = 10{\cdot}48$, $P < 0{\cdot}003$, reflecting a significantly greater decrease in the proportion of categorical memories for the decentring group than the control group. There was a significant main effect of Time, $F(1, 43) = 13{\cdot}78$, $P < 0{\cdot}002$. There were no other significant main effects or interactions.

Examining Fig. 1, it seems that the significant Second intervention × Time interaction was mainly carried by the difference between decentring and control following rumination. However, this does not reflect a First × Second interventions interaction, but rather reflects distraction lowering the proportion of categorical memories recalled to the floor level, such that decentring and control conditions both produced little change.

As a further check that the change in categorical memory was not the result of a change in mood, the repeated measures ANOVA was repeated with the change in despondency from Time 2 to Time 3 as a covariate. The Second intervention × Time interaction was still significant, $F(1, 43) = 9{\cdot}46$, $P < 0{\cdot}005$, as was the main effect of Time, $F(1, 43) = 8{\cdot}39$, $P < 0{\cdot}01$, but no other main effects or interactions were significant. Thus, the change in the overgenerality of the autobiographical memories was not secondary to changes in despondency.

A repeated measures 2 (First intervention: rumination *v.* control) × 2 (Second intervention: decentring *v.* control) × 2 (Time: 2 *v.* Time 3) ANOVA was calculated for the number of omissions. There was a significant Second intervention × Time interaction, $F(1, 44) = 5{\cdot}69$, $P < 0{\cdot}03$, reflecting a greater decrease in the number of omissions in the decentring condition (Time 2, mean = 2·96, S.D. = 2·25; Time 3, mean = 1·83, S.D. = 1·34) than the control condition (Time 2, mean = 2·46, S.D. = 2·36; Time 3, mean

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= 2·87, S.D. = 3·10). No other main effects or interactions were significant.

Participants with current affective disorders

To test the generalizability of the changes in categorical memories to a clinical sample, we repeated the analyses on the subset of participants ($N = 30$) who met DSM-III-R diagnosis for major depressive disorder alone ($N = 22$), dysthymia alone ($N = 4$) or both major depression and dysthymia ($N = 4$). This subsample was evenly distributed across the different conditions (rumination–decentring, $N = 8$; rumination–control, $N = 7$; distraction–control, $N = 8$; distraction–decentring, $N = 7$). The First intervention (rumination *v.* distraction) × Time (Time 1 *v.* Time 2) interaction for proportion of categorical memories recalled was still significant in participants which clinical diagnoses, $F(1, 28) = 4{\cdot}45$, $P < 0{\cdot}05$. The Second intervention (decentring *v.* control) × Time (Time 2 *v.* Time 3) interaction for proportion of categorical memories recalled was still significant, $F(1, 26) = 5{\cdot}26$, $P < 0{\cdot}05$. There was a nearly significant First intervention × Second intervention × Time (Time 2 *v.* Time 3) interaction, F $(1, 26) = 4{\cdot}08$, $P = 0{\cdot}055$. However, this interaction was reduced, once the change in proportion of categorical memories from Time 1 to Time 2 was used as a covariate, F $(1, 25) = 2{\cdot}63$, $P = 0{\cdot}12$. This finding suggests that the impact of distraction and rumination on baseline scores (i.e. the change from Time 1 to Time 2) differentially affected the responses to decentring and control prompts (i.e. the change from Time 2 to Time 3).

DISCUSSION

This study confirmed our prediction that, relative to rumination, distraction would reduce overgeneral autobiographical memory. The study also confirmed our prediction that decentring questions would reduce overgeneral memory relative to control questions. The results suggested that the decentring effect did not interact with the previous manipulation. These findings suggest that overgeneral autobiographical memory can be influenced by manipulations of the cognitive state of the person retrieving the memory. However, the present results are still consistent with the earlier suggestion that overgeneral memory is independent of mood state. The reductions in overgenerality of autobiographical memory remained when despondency was covaried out and occurred when there was no significant effects of the inductions on despondency, indicating that these changes could not be accounted for by changes in mood.

However, the prediction that, relative to rumination, distraction would significantly reduce dysphoric mood, was not confirmed, although the effects on mood of rumination and distraction were in a direction consistent with the effects found by Nolen-Hoeksema & Morrow (1993). One difference between Nolen-Hoeksema & Morrow (1993) and this study is the sample population: they used mildly dysphoric undergraduates, while this study used volunteers closer to the clinical range of depression. The limited effect of the rumination condition in the current study might have resulted from the participants spontaneously ruminating at a ceiling level or already being at ceiling for despondent mood.

Before considering the implications of the current findings, it is worth noting several limitations of the study. The current sample, while dysphoric, was not a full clinical sample, suggesting that replication with a sample of only patients with major depressive disorder would be useful. Furthermore, the experimental design lacked non-dysphoric control groups, to examine whether the effects of the manipulations were limited to a dysphoric sample. Since no other studies have reported the repeated use of the AMT in a single test session, it is possible that repeated administrations of the AMT alone would result in baseline changes in overgeneral memory. Thus, repeated administrations of the AMT using a control sample would be useful to determine the effects of practice on baseline changes in overgeneral memory for a non-dysphoric group. Without knowing the baseline changes in overgeneral memory to repeated administrations of the AMT, it is not possible to determine the manipulation active in altering overgeneral memory. For example, if the trend was for memories to become less categorical, then rumination would be the active manipulation; if the trend was for memories to become more categorical or not alter, then distraction would be the active manipulation.

Because of difficulties in recruiting partici-

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pants, symptoms were only assessed with a BDI at one time point, instead of repeated administrations across time to check the stability of mood. However, the high levels of past major depressive disorder (75%) and current major depression (50%), indicate that the experimental sample was likely to have stable negative moods. Furthermore, we wanted a sample with high levels of categorical memory, for which a history of past depression is a sufficient criterion. Because of time limitations, only the Mood Syndromes component of the SCID was administered, preventing any conclusions about the possible impact of co-morbid diagnoses on the outcome of the manipulations.

The current results provide some new evidence concerning the overgeneral autobiographical memory phenomenon. First, the results confirm that overgeneral autobiographical memory is not immutable. The observation that changes in the focus of cognitive processing prior to the memory task can influence the recall of categorical memories, suggests that overgeneral memory is influenced by the immediate cognitive state at recall. This finding raises the possibility that overgeneral autobiographical memory is dynamically maintained; that increased generation of categorical memories depends upon the continuing activation of a particular state or mode of cognitive processing. Shifting processing away from this state of processing, for example by an experimental manipulation such as distraction, may reduce the recall of categorical memories.

Secondly, the observed effects of distraction and decentring must have occurred at the stage of memory retrieval: encoding of the autobiographical memories occurred prior to the experimental tasks. Therefore, the current findings implicate memory retrieval processes, rather than the encoding of memories, in the generation of categorical memories. The experimental manipulations may have worked by altering the accessibility of categorical memories.

Thirdly, the current results are consistent with Williams' (1996) hypothesis that rumination is associated with the maintenance of overgeneral memory. Rumination maintained categorical autobiographical memory, while distraction reduced categorical autobiographical memory. A ruminative style is often found in individuals at risk of depression (including people in remission) and in people currently depressed (Nolen-Hoeksema, 1991) and, therefore, may be a factor in the high rates of overgeneral memory found in these groups.

Fourthly, decentring questions reduced categorical memory recall compared to control questions. Socratic questions in cognitive therapy encourage people to recall different aspects of personal experience, in order to challenge negative thoughts and attributions. It seems that the decentring prompts act in a similar way, since they increased the recall of specific memories. Since the participants were not asked to answer the questions during the task, the increased recall of specific memories may be due to either covert attempts to answer the questions or to the questions implicitly priming the accessibility of personal memories. We hypothesize that because the decentring questions were novel, without a ready-made answer, they prompted participants to focus more directly on their own experiences rather than on conceptual knowledge. For example, the question 'How long does any mood last?' is unlikely to have been encountered before and thus propositional knowledge, summarizing past events, including categorical memories, will not be helpful in answering it. Rather, the question will encourage focus on experiential knowledge, including specific memories. We propose that this shift in the focus of attention from propositional to experiential knowledge increases the accessibility of specific memories. This proposal is consistent with the reduction in overgeneral memory found for mindfulness-based cognitive therapy, which also encourages people to focus in more detail on their moment-to-moment experience (Williams *et al*. 2000). Future experiments, manipulating the degree to which questions encourage experiential *versus* conceptual focus, could test this hypothesis.

The reduction in overgeneral memory following the distraction task and the decentring task suggests specific clinical strategies for depression. Since challenging negative thoughts and problem solving depend upon the ability to access specific information (Williams, 1992), the prior use of distraction or decentring tasks may aid these endeavours. However, the relative efficiency and ease of use of the two strategies in a clinical setting remain to be determined.

In conclusion, this study demonstrates that

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the tendency to retrieve overgeneral autobiographical memories can be altered by brief experimental manipulations of cognitive processing. These results suggest that overgeneral memory depends upon the style of processing active at memory retrieval. This finding suggests that suitable psychological treatments could reduce overgeneral memory in depressed patients, consistent with Williams *et al*. (2000). The current result extend the empirical data indicating the impact of distraction *v*. rumination on the valence of autobiographical memories retrieved (Lyubormirsky *et al*. 1998) to the specificity of memories retrieved, implicating rumination as a possible factor in overgeneral memory. Future research will need to determine to what extent similar or different processes are involved in the mechanisms of decentring and distraction. The role of rumination in the generation of overgeneral memories also requires further testing.

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