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REDUCTIONS IN SPECIFIC FIRST MEMORIES IN DEPRESSION:  
**INFLUENCES OF DISTRACTION, REFERENTIAL SET AND CUE-WORD  
VALENCE ON FIRST MEMORY RETREIVAL**

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**Running Head:** Specific memories and depression

**Keyword:** Depression, autobiographical memory, AMT

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**ABSTRACT**

This study examined the association between depression and autobiographical memory deficits. Specifically, it evaluated the impact of depression, complexity of a distraction task, self- or other-referential set and positive or negative cue-word valence on the retrieval of specific autobiographical memories. A sample of 24 depressed women and 24 matched controls completed the Autobiographical Memory Task (AMT) before and after either a high- or low-complexity distraction task. Compared with the control group, the depressed group retrieved fewer specific first memories and had longer retrieval latencies for these. In the self-referential condition this pattern was more pronounced than in the other-referential condition. This suggests that depression is associated with a particular vulnerability in recalling specific self-referential memories. Distraction task complexity and cue-word valence did not affect AMT performance.

## INTRODUCTION

Depression is associated with autobiographical memory deficits that may maintain depressed mood. From a clinical perspective, broadening our understanding of factors that influence the efficiency of autobiographical memory in depression may suggest ways to improve the effectiveness of psychological treatments of depression. The aim of this study was to examine the impact of different types of distraction, self- or other-referential set, and positive or negative cue-word valence on the retrieval of autobiographical memories in people with and without clinical depression. Depressed people tend to recall negative rather than positive and general rather than specific autobiographical memories (Williams, Watts, MacLeod & Mathews, 1997). Williams (1996) has proposed the following theoretical framework to link autobiographical memory deficits to depression. He argues that when depressed people try to remember a specific positive event, they become trapped by a 'mnemonic interlock' at the higher, affective-laden abstract conceptual level of memory, resulting in delay or failure in the retrieval of lower-order specific memories. Impairment in specific memory retrieval has a negative impact on problem-solving ability and the reinterpretation of memories. It also obscures the links between mood, thoughts and behaviour, and contributes to the generalisation and catastrophization of events that imply negative self-descriptions in the maintenance of depressed mood (Brittlebank, Scott, Williams & Ferrier, 1993; Evans, Williams, O'Loughlin & Howells, 1992; Watkins, Teasdale & Williams, 2000; Williams & Broadbent, 1986).

The Autobiographical Memory Task (AMT; Williams & Broadbent, 1986) requests the retrieval of autobiographical memories in response to positively and negatively valenced cue words. It has been used extensively to investigate autobiographical memory deficits in

depression. In this task participants are invited to give specific memories they associate with positively valenced cue words like 'happy' or 'safe', and negatively valenced cue words like 'sorry' or 'angry'. Compared with normal controls, depressed patients have been found to recall a greater proportion of non-specific or overgeneral memories and a smaller proportion of specific memories (Williams, 1996). Furthermore, the latency to retrieving specific memories is longer for depressed than non-depressed people (Williams, 1996). In this context, a specific memory is an account of a time and a place when something specific happened. The following is an example of a specific memory in response to the cue word 'safe': 'I felt safe last week when I came ashore in Sutton after a difficult capsizing with Barry in the IDRA 14.' In contrast, non-specific or overgeneral memories make reference to a general category of events. For example, in relation to the cue word 'safe', the response 'I feel safe when I'm in bed' is an overgeneral memory. Findings using this and other methods have shown that cue-word valence does not always affect the number and latency of specific memories retrieved (Brittlebank et al., 1993; Kuyken & Brewin, 1995; Kuyken & Dalgleish, 1995; Puffet, Jehin-Marchot, Timsit-Berthier & Timsit, 1991; Williams & Dritschel, 1988; Williams & Scott, 1988).

Distraction from a ruminative self-focus may influence autobiographical memory deficits in people with depression (Watkins & Teasdale, 2001). In this context a distinction may be made between distraction tasks of low complexity where attention is focused on simple external objects or internal images, and more complex distraction tasks where the focus is on issues that require extensive analytic thought, such as trying to understand the world we live in. There is some evidence that low-complexity distraction tasks can modify overgeneral autobiographical memory deficits in depression (e.g., Watkins & Teasdale, 2004; Watkins et al., 2000; Williams, Teasdale, Segal & Soulsby, 2000). Watkins et al. (2000) showed that a

brief distraction procedure reduced dysphoric mood and overgeneral autobiographical memory in depression. In a negative mood induction study of non-depressed people, Watkins and Teasdale (2004) found that writing in an experiential mode in which moment-by-moment accounts of task failure were given alleviated distress. In contrast writing in a conceptual-evaluative mode where an attempt was made to explain why failure occurred did not alleviate distress. Williams et al. (2000) found that recovered depressed people who participated in a mindfulness-based cognitive therapy programme – which involved focusing on everyday events in a non-judgemental way rather than suppressing negative cognitions – recalled significantly more specific memories during the AMT after treatment than those in a treatment-as-usual control group.

The possibility that depression is primarily associated with difficulties in retrieving specific self-referenced memories rather than other-referenced memories has also been investigated using the AMT. Bogue and Davidson (1997) found that the performance of depressed people on the AMT was not differentially affected by self- and other-referential set instructions. In the self-referenced condition participants were asked to retrieve a specific personal memory. In the other-referenced condition they were asked to recall a specific memory that a close significant other (e.g., a sibling or a spouse) might retrieve in response to the cue words. However, Bogue and Davidson's study requires modification and replication since they did not counterbalance the order of the self- and other-referential set conditions. For all cases the self-referential set condition was followed by the other-referential condition.

In the present study we aimed to investigate whether overgeneral memory retrieval in depressed people is influenced by AMT referential set by counterbalancing the order of the AMT referential set conditions. In addition, we examined the efficacy of a brief low-

complexity distraction procedure in increasing the accessibility of specific memories in depressed participants compared with non-depressed controls, following Watkins and Teasdale's (2001) procedure. The following hypotheses were tested:

(1) The depressed group will retrieve fewer specific first memories and have longer retrieval latencies for these than the control group.

(2) The depressed group will retrieve more specific first memories with shorter response latencies for these after a low-complexity distraction task compared with a high-complexity distraction condition, but for the control group responses will not differ in high and low distraction task complexity conditions. The low-complexity distraction task is expected to be more effective in enhancing autobiographical memory deficits for the depressed group because, unlike the high-complexity task, it is expected to disrupt rumination.

(3) In the self-referential set condition (but not the other-referential condition) the depressed group will: (a) retrieve fewer specific first memories and (b) have longer retrieval latencies for these than the control group.

## **METHOD**

### **Participants**

The study participants were 24 females recruited from a community outpatient clinic who met the ICD-10 (World Health Organization, 1993) criteria for a severe depressive episode without psychotic features and who scored above the clinical cut-off score of 14 on the Beck Depression Inventory II (BDI-II; Beck, Steer & Brown, 1996). Cases were excluded if they: (a) had been treated with ECT in the preceding six months; (b) had an organic condition known to cause memory deficits; (c) met the diagnostic criteria for alcohol or substance abuse; or (d) met the diagnostic criteria for bipolar disorder. The depressed group had an

average age of 38.75 years ( $SD = 13.05$ ). The study also recruited a convenience sample of non-depressed controls. These were matched for age ( $M = 38.38$  years,  $SD = 12.16$  years), gender and educational level. The controls were included in the study if they had BDI-II scores below the clinical cut-off score of 14 and had no history of memory impairment or mood disturbance. All participants were aged between 20 and 61 years. Their education levels ranged from secondary school to postgraduate degree level qualifications. Using national Irish census definitions, socio-economic status levels ranged from ‘unskilled manual’ to ‘higher professional’ groups. BDI-II scores for the depressed group fell at the high end of the moderate range and were significantly higher than those of the control group ( $t = 11.30$ ,  $df = 46$ ,  $p < 0.01$ ; Depressed  $M = 28.46$ ,  $SD = 9.86$ ; Non-depressed  $M = 4.54$ ,  $SD = 3.22$ ). The majority of clinical participants had multiple previous episodes of depression for more than two years. Forty-two percent suffered from co-morbid psychological disorders and 9% from chronic co-morbid physical disorders (i.e., asthma and arthritis). Seventy-nine percent were being treated with antidepressant medication. In all but one case, where tricyclic antidepressants had been prescribed, patients were being treated with selective serotonin reuptake inhibitors. The majority of cases were also receiving psychological therapy based on cognitive behavioural principles.

## **Instruments**

### *Diagnostic instruments*

The study used the BDI-II (Beck et al., 1996) and the mood disorders module of the patient edition of the Structured Clinical Interview for DSM-IV-TR Axis I Disorders (SCID; First, Spitzer, Gibbon & Williams, 2002). The ICD-10 (WHO, 1993) criteria were adopted to make diagnoses of depression using data from the SCID.

*Autobiographical Memory Test*

Instructions for the Autobiographical Memory Test (AMT; Williams & Broadbent, 1986) in the self-referential set condition were:

I am going to present you with a series of written words. I would like you to read each word aloud, and then tell me a specific personal memory that you associate with this word.

For the other-referential set condition the instructions were:

I am going to present you with a series of written words. I would like you to read each word aloud, and then tell me a specific personal memory that a person you know well might associate with this word. The person you choose does not need to be the same person for each word.

In both conditions participants were presented with three practice words (i.e., enjoy, friendly and bold), followed by five positively and five negatively valenced words. There were two AMT word sets to allow for repeated administration before and after the distraction task (Watkins and Teasdale, 2001; Williams & Broadbent, 1986). Set A included these positively valenced cue words: happy, safe, interested, successful and surprised. It also included the following negatively valenced cue words: sorry, angry, clumsy, hurt and lonely. The positively valenced cue words in set B were: relieved, proud, eager, hopeful and devoted. For set B the negatively valenced cue words were: guilty, bored, ugly, misery and weakness. Cue words were presented on cards in random order with the constraint that positively and negatively valenced words were presented in an alternating sequence. If the first response was not a specific memory, then participants were prompted as follows: 'Can you think of a specific time, one particular occasion?'

First memories retrieved in response to cue words were scored for specificity and latency. Responses were coded as specific if memories were of a time and a place when something specific happened. To check the reliability of memory specificity ratings, 10% of

responses were coded by a pair of raters. The second rater was blind to diagnosis and the coding given by the first rater. Inter-rater reliability was above .8, a finding which is consistent with similar studies (e.g., Williams & Dritschel, 1988). Where participants spontaneously reported specific memories without prompting after an initial general memory, these were not coded as specific first memories. Latencies to specific first memories were timed with a stopwatch during the interview and subsequently checked against audiotape recordings. If a specific memory was not retrieved within 60 seconds, it was coded as an omission when calculating the number of specific first memories and as a 60-second latency when computing latency to specific first memory recalled.

### *Distraction Tasks*

Half of the participants in the depressed and control groups were assigned to the high and low distraction task complexity conditions. For both the high- and low-complexity distraction tasks participants were given the following instructions:

For the next few minutes, try your best to focus your attention on each of the ideas on the following pages. Read each item slowly and silently to yourself. As you read the items, use your imagination and concentration to focus your mind on each of the ideas. Spend a few moments visualising and concentrating on each item.

The participants were allowed 8 minutes to read 28 sentences at a self-paced speed. In the low-complexity condition participants read sentences that described externally focused objects or events (e.g., a boat slowly crossing the Atlantic; the layout of a typical classroom; fire darting round a log in a fireplace; the shape of a large black umbrella). In the high-complexity condition participants read sentences that described abstract or philosophical items (e.g., why people often act inconsistently; whether the ends justify the means; whether history repeats itself; trying to understand the world you live in). Items in the high- and low-complexity distraction tasks have been rated as equally neutral in affective tone by

nondepressed judges (Nolen-Hoeksema & Morrow, 1993). To check that the high and low distraction tasks induced different levels of analytic thought, at the end of the experiment participants were asked: ‘Using a scale from 1 to 100 what proportion of your thoughts were concerned with trying to understand, explain, or make sense of things when you were reading the sentences on the sheet?’ An analysis of these data (which supported the validity of the distraction tasks) is reported in the results section.

### **Procedure**

After the participants gave written informed consent, the BDI-II was administered. The depressed group (but not the controls) were interviewed at this point using the mood disorders module of the SCID. All the participants then completed the self- and other-referenced versions of the AMT. Within the two groups, the order of the two AMT versions was counterbalanced. Scores from this administration are referred to as AMT pretest or Time 1 scores. Subsequently, half of the participants from each group read either the low- or high-complexity distraction task sentences for eight minutes. After this, they were asked what proportion of their thoughts during the attentional manipulation procedure had been concerned with trying to understand, explain or make sense of things. Following this, all the participants completed the self- and other-referenced versions of the AMT. Again, within the two groups the order of the two AMT versions was counterbalanced. Scores from this administration are referred to as AMT posttest or Time 2 scores. Two different word sets (counterbalanced for order) were used for the AMT at pretest and posttest. Finally, the participants were asked what they thought the study was about and were informed of the actual rationale for the study. No participant guessed that the manipulations were intended to alter memory specificity, although some thought it was about remembering emotionally significant memories.

## RESULTS

### Design

A mixed-model design was used with two between-subjects and three within-subjects variables. The between-subjects variables were Diagnosis and Distraction Task Complexity. The within-subject variables were Referential Set, Cue-Word Valence and Time. Each independent variable had two levels. For Diagnosis, there were depressed and control groups. For Distraction Task Complexity, there were high and low levels. For Referential Set, there were self and other conditions. For Cue-Word Valence there were positively and negatively valenced words. For Time, there were pretest (Time 1) and posttest (Time 2) occasions. Two dependent variables were derived from the AMT: (a) numbers of specific first memories and (b) mean response latency to first specific memories. For Distraction Task Complexity, equal numbers of cases were randomly assigned from the depressed and control groups to the high- and low-complexity conditions. For Referential Set and word set, order of presentation was counterbalanced. All the participants received the same order of positive and negative cue-word valences within each word set.

### Data management

The data approximated the assumptions of normality of distribution and homogeneity of variance sufficiently to justify the use of parametric statistics. For simplicity, in the main analyses only effects, means and standard deviations relevant to the hypotheses being tested are mentioned.

### Checks of equivalence of word sets and order of conditions

To check the equivalence of the two word sets, the statistical significance of differences in responses to both lists was evaluated with *t*-tests and found to be non-significant. To check

the functional equivalence of responses to the two referential set AMT task orders, the statistical significance of differences in responses to both orders before and after the distraction task was evaluated with *t*-tests. In both of these analyses, data were collapsed across independent variables. With only one exception, differences between word sets and orders of referential set conditions were not significant. Thus, it was concluded that word sets and the order of referential set conditions had no major impact on the dependent variables.

### **Validity check on high and low distraction tasks**

Analyses were conducted to ensure that the high-complexity distraction task led to higher levels of analytic thinking than the low-complexity one and that such differences were not due to the order of referential set conditions at Time 1. For the depressed and control groups, separate  $2 \times 2$  Distraction Task Complexity (high, low)  $\times$  Order of AMT Referential Set at Time 1 (self, other) ANOVAs were conducted on reported proportion of analytical thoughts. For both the depressed and the control group, the high-complexity distraction task led to significantly higher levels of analytic thinking than the low-complexity one [Depressed group  $F(1, 20) = 12.41, p < .01$ ; Control group  $F(1, 20) = 7.57, p < .05$ ]. The other effects and interactions in these analyses were not significant.

### **The number of specific first memories retrieved**

The Depression  $\times$  Distraction Task Complexity  $\times$  Referential Set  $\times$  Cue-Word Valence  $\times$  Time ANOVA on number of specific first memories yielded a significant main effect for Depression [ $F(1, 44) = 15.01, p < .01$ ] and a significant Depression  $\times$  Referential Set interaction [ $F(1, 44) = 17.16, p < 0.01$ ].

An examination of the means associated with the main effect for Depression indicated that the first hypothesis was supported. Compared with the control group ( $M = 3.95, SD =$

1.07), the depressed group ( $M = 2.76$ ,  $SD = 1.07$ ) retrieved significantly fewer specific first memories.

An examination of the means associated with the Depression  $\times$  Referential Set interaction indicated that the third hypothesis was not supported, although the pattern of results approximated that expected. In the self-referential set condition, the depressed group retrieved significantly fewer specific first memories than the control group [Depressed group  $M = 2.58$ ,  $SD = 1.11$ ; Control group  $M = 4.10$ ,  $SD = 1.11$ ;  $F(1, 44) = 46.34$ ,  $p < .01$ ]. In the other-referential set condition the groups also differed significantly in the number of specific first memories they retrieved. However, the difference was not as large as that which occurred in the self-referential condition [Depressed group  $M = 2.93$ ,  $SD = 1.09$ ; Control group  $M = 3.79$ ,  $SD = 1.09$ ;  $F(1, 44) = 14.89$ ,  $p < .01$ ].

### **Latency to retrieve a first specific memory**

The ANOVA for Depression  $\times$  Distraction Task Complexity  $\times$  Referential Set  $\times$  Cue-Word Valence  $\times$  Time for mean latency to retrieve a first specific memory yielded a significant main effect for Depression [ $F(1, 44) = 6.63$ ,  $p < .05$ ] and a significant Depression  $\times$  Referential Set interaction [ $F(1, 44) = 9.82$ ,  $p < .01$ ].

An examination of the means associated with the main effect for Depression indicated that the first hypothesis was supported. The mean latency (in seconds) to retrieve first specific memories was longer for the depressed group ( $M = 27.82$ ,  $SD = 9.80$ ) than for the control group ( $M = 20.53$ ,  $SD = 9.80$ ).

An examination of the means associated with the Depression  $\times$  Referential Set interaction indicated that the third hypothesis was supported. In the self-referential set condition, the depressed group's retrieval latencies were longer than the control group's [Depressed group  $M = 28.19$ ,  $SD = 9.79$ ; Control group  $M = 18.27$ ,  $SD = 9.79$ ;  $F(1, 44) =$

17.46,  $p < .01$ ]. However, in the other-referential set condition the groups did not differ significantly in their retrieval latencies [Depressed group  $M = 27.43$ ,  $SD = 10.65$ ; Control group  $M = 22.77$ ,  $SD = 10.65$ ;  $F(1, 44) = 3.85$ ,  $p > .05$ ].

## DISCUSSION

The results of the study supported the first hypothesis which stated that, compared with the control group, the depressed group would retrieve fewer specific first memories and have longer retrieval latencies for these. The second hypothesis, which stated that the depressed group would retrieve more specific first memories with shorter response latencies for these after a low- versus a high-complexity distraction condition, was not supported. The third hypothesis stated that in the self-referential condition (but not the other-referential condition) the depressed group would retrieve fewer specific first memories and have longer retrieval latencies for such memories than the control group. It was partially supported: the expected pattern occurred for latencies to retrieve specific first memories, but not for number of specific first memories.

We have confidence in the validity of the study results because we increased the methodological rigour of previous studies by counterbalancing the cue-word list order and the AMT referential set order. We also used a non-depressed control group for comparison of the effect of distraction task complexity.

Our finding of the impact of depression on autobiographical memory is consistent with previous findings of an overgeneral mode of retrieval in depressed individuals (Williams et al., 1997) and supports theories of a functional deficit in autobiographical memory retrieval in depression.

In the self-referential condition difficulties retrieving specific memories were more pronounced than in the other-referential condition. This suggests that depression was

associated with a particular vulnerability in recalling specific self-referential memories, a hypothesis proposed by Bogue and Davidson (1997). The results are consistent with earlier findings of referential set bias in studies employing methodologies other than the AMT to investigate the impact of the theoretical depressive negative self-schema. These include findings of preferential mood congruent material in semantic recall (e.g., Bradley & Matthews, 1983), impaired mood incongruent recall (e.g., Clifford & Hemsley, 1987; Derry & Kuiper, 1981) and slowed response to negative self-referent prime-target pairs (e.g., Segal, Gemar, Truchon & Guirguis, 1995).

Our failure to find an effect for distraction task complexity on autobiographical memory functioning is inconsistent with the results of Watkins and Teasdale (2001). The present study modified Watkins and Teasdale's methodology through the inclusion of an 'other-referential set' condition which increased the number and type of memory recall tasks and may have had an impact on our results.

Our finding that cue-word valence does not affect the numbers of specific memories retrieved or the retrieval latencies is consistent with some (e.g., Brittlebank et al., 1993; Kuyken & Brewin, 1995; Kuyken & Dalgleish, 1995) but not all (e.g., Puffet et al., 1991; Williams & Dritschel, 1988; Williams & Scott, 1988) previous studies in this area. Early studies found that depressed individuals showed slowed recall and more overgeneral recall in the positive cue-word condition (Puffet et al., 1991; Williams & Dritschel, 1988; Williams & Scott, 1988).

The finding that the autobiographical memory deficits of depressed people are greater when self-referential instructions are given requires replication. Further research on the beneficial effects of different types of distraction tasks and coping strategies on ATM performance is also necessary.

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