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Autobiographical Memory Style in Seasonal Affective Disorder and Its Relationship to Future Symptom Remission

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Autobiographical memory was examined in participants with seasonal affective disorder (SAD). In Experiment 1, participants with SAD performed an autobiographical memory task (AMT) in the winter, when depressed. The AMT required participants to generate autobiographical memories to positive and negative cue words. Symptom levels were reassessed in the summer, when participants were remitted. The number of overly general memories to positive cues generated when the SAD participants were depressed predicted symptom levels when remitted, over and above initial symptom levels, with greater winter overgenerality being associated with high levels of summer symptoms. However, this was dependent on the exact measure of depressive symptoms used. The degree of overgenerality of memories in SAD participants was further investigated in Experiment 2. Results revealed that SAD participants did not show elevated recall of overgeneral memories relative to controls. The results as a whole indicate that, even when levels of general memories are no greater in a given target group than in controls, the absolute level of general memories to positive cue words is still independently related to symptom outcome.

Seasonal affective disorder (SAD) is a mood disorder characterized by seasonal onset and remission of depressive episodes, with depressed mood occurring in the winter months and remitted mood in the summer. The symptoms of SAD are those of other depressive disorders in the *Diagnostic and Statistical Manual of Mental Disorders* (4th edition; *DSM–IV;* American Psychiatric Association, 1994), although the syndrome is characterized by an increased likelihood of reversed neurovegetative symptoms such as increased (rather than decreased) appetite and hypersomnia rather than insomnia.

There are a number of theories concerning the etiology of SAD (see Dalgleish, Rosen, & Marks, 1996, for a review), for the most part focusing on biological factors related to seasonal changes in light–dark cycles. As a result of this emphasis on biological aspects of the disorder, the psychology of SAD, until recently, has been relatively neglected (see Dalgleish et al., 1996, for a discussion). However, there is now an increasing number of studies addressing the psychological aspects of the syndrome (e.g., Bagby, Schuller, Levitt, Joffe, & Harkness, 1996; Levitan, Rector, & Bagby, 1998; Young, 1999). The reliable seasonal variation in clinical levels of depressive symptomatology in SAD provides a potential vehicle for examining the relationship of psychological variables to the presence or absence of depressed mood within a longitudinal design. Furthermore, the theoretical emphasis on SAD as a disorder predominantly characterized by biological mood changes allows an examination of the similarities and differences between this type of mood fluctuation with that associated more clearly with changes in psychological constructs such as schemas (Beck, Rush, Shaw, & Emery, 1979).

This study examines autobiographical memory performance in SAD and its relationship to summer remission of symptoms. Autobiographical memory functioning has been the focus of considerable research in the depression literature. Early research on autobiographical memory in nonseasonal depression concentrated on the accessibility of memories retrieved (see J. M. G. Williams, Watts, MacLeod, & Mathews, 1997, for a review). More recently, in line with the development of cognitive–behavioral therapy with its emphasis on thinking style as well as on thought content (Beck, Rush, Shaw, & Emery, 1979), researchers have examined the retrieval style used in autobiographical memory tasks (AMTs). For example, J. M. G. Williams and Broadbent (1986) asked parasuicide patients to generate highly specific autobiographical memories to positive and negative cue words such as *clumsy* or *safe.* Williams and Broadbent reported that, relative to the controls, the patient group found it harder to generate specific memories located in time and place. Instead, they tended to produce general memories that represented summaries across episodes or categories in

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their lives; for example, to the word *happy* they might respond "I am happy when I go jogging."

This *overgenerality effect* in autobiographical recall has been replicated many times and across numerous patient samples (see Healy & Williams, 1999, for a review). In some of the studies the effect is found to both positive and negative cue words (e.g., Kuyken & Dalgleish, 1995; Moore, Watts, & Williams, 1988), whereas in others it is stronger in response to positive cues (e.g., McNally, Lasko, Macklin, & Pitman, 1995; J. M. G. Williams & Broadbent, 1986; J. M. G. Williams & Scott, 1988). Williams (e.g., J. M. G. Williams et al., 1997) has suggested that the overgenerality effect may reflect a failure on the part of mood-disordered individuals to inhibit a categorical level of description during the memory search process such that they then fail to successfully introduce contextual (time and place) information into the mnemonic search.

The longitudinal aspects of the overgenerality effect have been examined in two main studies. Brittlebank, Scott, Williams, and Ferrier (1993) followed up 19 patients with a diagnosis of major depressive disorder over 7 months. A number of the participants remained depressed at follow-up. Regression analyses revealed that the degree of overgenerality on the AMT at initial assessment predicted levels of depressive symptoms at follow-up, even when initial symptom levels were partialled out. Specifically, a more overgeneral memory style to positive cues at initial testing was associated with higher symptom levels at follow-up.

Brewin, Reynolds, and Tata (1999) followed up 44 patients with a diagnosis of major depressive disorder over a 6-month period. The results showed that, even though levels of overgeneral memories at Time 1 did predict later symptom levels, this relationship disappeared once original symptom levels were controlled for.

There are a number of methodological differences between the two studies that may account for the different patterns of results. For example, different measures of depression were used as the outcome variable. Brittlebank et al. (1993) used the Hamilton Rating Scale for Depression (HRSD; Hamilton, 1960)—an interview measure with little emphasis on the cognitive aspects of depression—whereas Brewin et al. (1999) used the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), a self-report measure strongly focused on the cognitive features of the disorder.

Establishing whether autobiographical memory style does indeed independently predict later depressed mood is important because, if true, it would suggest that the tendency to produce overgeneral memories, instead of being an epiphenomenon of depression, is a marker of some fundamental psychological process underlying recovery from depression. Consequently, understanding this process would have obvious implications for the development of psychological treatments for the disorder.

In Experiment 1 we therefore sought to further examine whether autobiographical memory style predicted later depressive symptoms (even with initial symptom levels controlled for) in another form of affective disorder, namely, SAD. In our study we used a similar longitudinal design to that used by Brittlebank et al. (1993) and Brewin et al. (1999). In the present study, depression symptoms at follow-up were assessed using both the HRSD and the BDI.

Experiment 1

Method

Participants

Twenty-four members of the SAD Association, a self-help organization in the United Kingdom, were recruited at the Association annual meeting through oral advertisement. Criteria for inclusion in the final analysis were as follows: (a) meeting *DSM–IV* criteria for recurrent mood disorder with seasonal pattern (American Psychiatric Association, 1994) and presenting with a current major depressive episode as assessed by clinical interview at Time 1 (winter testing). In the interview we used the questions from the Structured Clinical Interview for *DSM–IV* (SCID; First, Spitzer, Gibbon, & Williams, 1997) to assess the presence of a major depressive episode along with additional questions on seasonality derived from the *DSM–IV;* (b) being available for retesting at Time 2 (summer testing); (c) presenting with no evidence of psychosis or organic brain damage; and (d) being between the ages of 16 and 60. Two participants were unable to take part in summer testing, and one participant did not meet diagnostic criteria for SAD at Time 1. These 3 participants were therefore excluded from the study, giving a final sample size of 21. Participant ages ranged from 16 to 60 (M = 42.14 years; SD = 12.23). Gender was predominantly female with a female:male ratio of 17:4. This is similar to SAD gender ratios described elsewhere (Dalgleish et al., 1996).

Materials

Mood measures. The SAD participants were administered the Hamilton Rating Scale for Depression—SAD version (HRSD–SAD; J. B. Williams, Link, Rosenthal, Amira, & Terman, 1988). The HRSD-SAD is a structured interview modified from the HRSD (Hamilton, 1960) that measures levels of both depression and SAD. There are 21 depression questions (HRSD) reflecting the original scale (which has well-established reliability coefficients of .84–.90) and 8 SAD questions that can be added in to give a total score (HRSD–SAD). Participants also completed the State scale of the Spielberger STAI–Y1 (Spielberger, Gorsuch, & Lushene, 1970) and the BDI (Beck et al., 1961).

Autobiographical Memory Test (AMT). The AMT was as described by Kuyken and Dalgleish (1995) and Brewin et al. (1999). The original 10 emotional words used by Williams and Broadbent (1986) were used to cue memories. There were five positive words (*happy, safe, interested, successful,* and *surprised*) and five negative words (*sorry, angry, clumsy, hurt,* and *lonely*). Participants were given 1 min in each case to retrieve a specific autobiographical memory (a time and place when something happened to them). The recall instructions emphasized that the memories should be specific and were printed out for the participants to read. Cue words were presented on 12.5 cm × 7.5 cm cards and were written in black ink in capital letters 3.5 cm high. Words were presented in pseudo-random order with positive and negative words alternating. The latency to the first word of each specific recalled memory was recorded.

If participants did not retrieve a specific memory, they were given a single verbal prompt ("Can you think of a specific time—one particular event"). If participants did not retrieve a specific memory within 60 s, the experimenter (Helen Spinks) proceeded to the next cue word in line with previous studies. To ensure that participants understood the instructions, two practice cues were given (*relieved* and *tired*). Previous research (J. M. G. Williams & Broadbent, 1986) has found that the distinction between general and specific memories can be rated reliably (interrater reliabilities between 0.87 and 0.93).

Procedure

Participants took part in a clinical interview before completing the AMT. They were next assessed using the HRSD–SAD and then completed the

BDI and STAI–Y1. Participants were assessed at two time points. Time 1 was in November/December (winter), and Time 2 was in June/July (summer) of the following year. The intertest interval ranged from 6 to 8 months. The same procedure and measures were used at the two time points; however, latency data and summer AMT performance are not reported here.

Results

Table 1 presents the descriptive data for the SAD sample at both time points, along with the number of overgeneral memories to positive and negative cue words in the winter.

Mood

None of the SAD participants met criteria for a major depressive episode at Time 2. According to the Frank et al. (1991) criteria for interpreting scores on the HRSD, 18 of the participants were fully remitted in the summer and 3 were partially symptomatic. Comparison of winter mood scores with those in the summer revealed highly significant improvements in mood, lowest $t(20) = 3.8$, all $ps < .001$ (see Table 1).

AMT Performance

To examine the replicability of the findings of Brittlebank et al. (1993) and Brewin et al. (1999), zero-order correlations examining the relationship between overgenerality in the winter and self-reported mood in the summer were performed. There were no significant correlations between the mean number of general memories to negative cue words in the winter and mood in the summer ($ps > .14$), although the absolute numbers of overgeneral memories here are very low, so not much can be read into this finding. However, zero-order correlations between the number of general memories to positive cues in the winter and mood at follow-up in the summer were comparable with the Brittlebank et al. data: BDI, $r(20) = .40$, $p = .07$; HRSD, $r(20) = .48$, $p = .03$; HRSD–SAD, $r(20) = .38$, $p = .09$; STAI–State, $r(20) = .43$, $p = .05$.

In line with Brittlebank et al.'s (1993) analyses, a multiple linear regression was carried out, with the HRSD score in the summer (Time 2) as the dependent variable. As in the Brittlebank et al. study, the number of overgeneral memories to positive cues in the winter and winter HRSD scores were entered as the independent variables. Overall, the model was significant, $R^2 = .42$, $p < .01$. In addition, there were significant partial effects of both winter HRSD score, $t(20) = 2.40$, $p < .05$, $\beta = .44$, and overgeneral memories to positive cues, $t(20) = 2.27$, $p < .05$, $\beta = .41$, indicating that increased number of overgeneral memories to positive cues in the winter significantly predicted increased HRSD depression scores in the summer, with HRSD winter scores controlled for.[1]

A second regression was then carried out, with BDI as the mood measure at winter and summer. This time the overall model was not significant, $R^2 = .19$, $p > .17$. In addition, there were no significant partial effects of either winter BDI score ($t < 1$) or winter overgeneral memories to positive cues,[2] $t(20) = 1.80$, $p = .09$, $\beta = .39$.

Table 1
Scores on the Mood and Autobiographical Memory Variables in Experiment 1

	Winter		Summer	
Variable	*M*	*SD*	*M*	*SD*
BDI**	21.75	13.83	7.24	7.56
STAI–Y1**	42.33	11.06	30.67	9.67
HRSD–SAD**	31.05	10.59	5.10	5.63
HRSD**	16.19	5.85	3.71	5.12
FMGP	0.57	0.68	—	—
FMGN	0.14	0.36	—	—

Note. BDI = Beck Depression Inventory; STAI–Y1 = Spielberger State–Trait Anxiety Inventory—State scale; HRSD = Hamilton Rating Scale for Depression; HRSD–SAD = HRSD—Seasonal Affective Disorder version; FMGP = number of first memories that were general to positive cues; FMGN = number of first memories that were general to negative cues.
** Winter and summer scores significantly different at $p < .001$.

Discussion

The results from Experiment 1 replicated the finding of Brittlebank et al. (1993) that the number of general memories to positive cues predicted HRSD scores at follow-up, even when initial symptom levels were controlled for. Because our study used a new clinical group and a different version of the AMT to that used by Brittlebank et al., this would seem to indicate that the original finding is to some extent reliable.

When the same longitudinal analysis was carried out with BDI scores as the outcome measure, as in the Brewin et al. (1999) study, the relationship between memory style and symptom outcome, with initial symptoms controlled for, was nonsignificant. This is in line with the Brewin et al. findings,[3] using the exact same version of the task. These results indicate that findings from the Brittlebank et al. (1993) and Brewin et al. (1999) studies are not necessarily contradictory and that the exact measure used to assess levels of depressive symptomatology may be crucial in detecting a significant relationship between autobiographical memory style and symptom outcome.

The extent of the difference between the two measures is evident from the fact that winter HRSD scores independently predicted summer HRSD scores, whereas this was not the case for the BDI scores. This seems to indicate that the two measures are reflecting different aspects of the depressed state. On the basis of these analyses, one could argue that the relationship between general memories and later symptoms only emerges when there is a separate relationship between symptom scores at the two time points. However, this is not supported by the data from the previous studies in which the reverse pattern is evident with no relationship between symptom measures across time in the Brittlebank et al. (1993) data and a significant relationship in the Brewin et al.

[1] This analysis was repeated with winter levels of state anxiety (STAI–Y1) also controlled for, and the pattern of results was unchanged.

[2] Both regressions were repeated with number of overgeneral memories to unpleasant cues as the independent variable. Neither model was significant, and the partial effects did not approach significance ($ts < 1$).

[3] However, the present data showed a stronger relationship between memory style and later BDI scores than the Brewin et al. (1999) findings.

(1999) study. This indicates that either the content of the two measures or the mode of administration (interview vs. self-report) is probably important.

The BDI is more clearly a measure of the cognitive symptoms of depression than the HRSD, which has a stronger focus on somatic–vegetative symptoms (Depue & Monroe, 1978; Gotlib & Cane, 1989; Hughes, O'Hara, & Rehm, 1982). It may be that overgeneral memory performance is therefore more closely related to the somatic–vegetative symptoms of depression as measured by the HRSD. In an additional regression analysis, we examined this by including summer BDI scores as an independent variable to partial out the cognitive aspects of the summer depression symptoms as measured by the HRSD. This analysis revealed that overgeneral memories in the winter showed a statistical trend to predict HRSD scores in the summer, with both winter HRSD and summer BDI scores controlled for: model, $F(3, 17) = 12.68$, $p < .0001$; overgeneral memories, $t(17) = 1.74$, $p = .09$, $\beta = .27$. In contrast, with summer BDI scores as the dependent variable and both winter BDI scores and summer HRSD scores partialled out, the relationship between winter overgeneral memory and summer BDI scores was highly nonsignificant, $t(17) = 0.05$, $p = .96$, $\beta = .01$. This overall pattern suggests a possible weak independent relationship between overgeneral memory and the later somatic–vegetative symptoms of depression as measured by the HRSD with BDI scores partialled out.

The fact that our data have again revealed a clear relationship between increased generality of memories to positive cue words and later depressive symptoms also merits some discussion. If this finding is reliable, it suggests that the explanation of the generality effect in terms of a childhood defense against specific negative information may need to be refined. One possibility is that, although generality effects develop initially as a function of avoiding specific negative information and then later generalize to positive information, as J. M. G. Williams et al. (1997) suggested, it is the latter effect that prevents the individual from counteracting depressed mood. This would be consistent with the predictive power of the generality effect to positive cues for recovery from depression. It is also consistent with the finding, in a host of studies, that depressed individuals differ from controls on a variety of memory tasks in recalling less positive information rather than more negative information (see J. M. G. Williams et al., 1997, for a review). However, the valence effects in research using the AMT have proved very unreliable (Healy & Williams, 1999). Until more consistency for any one effect can be demonstrated, such explanations must remain speculative.

The absolute levels of overgeneral memories in our study were very low compared with the levels of both depressed patients and controls in other studies using the same stimuli (Brewin et al., 1999; Kuyken & Dalgleish, 1995; J. M. G. Williams & Broadbent, 1986). As a preliminary examination of this issue, the numbers of overgeneral memories in 33 depressed and 33 nondepressed participants from a previous study using an identical methodology (Kuyken & Dalgleish, 1995) were compared with the data from the SAD participants in the present study. Nonparametric Kruskall–Wallis Tests[4] comparing the groups on numbers of memories to positive and negative cues revealed significant differences across groups in both cases. Positive cues: $\chi^2 = 17.43$, $p < .0001$; negative cues, $\chi^2 = 27.37$, $p < .0001$. Follow-up Mann–Whitney tests revealed that the SAD participants recalled significantly fewer overgeneral memories than both the patients and controls from the Kuyken and Dalgleish (1995) study ($ps < .01$).

Clearly, findings derived from comparing data across studies in this way can only be regarded as preliminary because of procedural differences between the studies, such as different experimenters, different seasonal testing times, and so on. For this reason, Experiment 2 was carried out to examine the replicability of this preliminary result in a methodologically robust study with a new group of SAD participants, this time under outpatient care.

Experiment 2

Method

Participants

There were 15 participants in the SAD group (10 women and 5 men, mean age = 42.8 years), all of whom were adult outpatients at the Maudsley Hospital, London. Participants were recruited through clinicians working on the Affective Disorders Unit at the hospital. Of the people approached to take part, none refused. All of the SAD participants met *DSM–IV* criteria for SAD and presented with a major depressive episode at the time of testing, as assessed by the SCID (First et al., 1997). The exclusion criteria were (a) any evidence of history of psychosis or organic brain damage; (b) being aged under 16 or over 65. All of the SAD participants were currently using phototherapy and were under the outpatient care of a psychologist, psychiatrist, or nurse therapist.

The control participants were matched for age and sex with the clinical participants. There were 15 controls (10 women and 5 men, mean age = 45.6 years), all of whom were recruited from the participant panel at the Medical Research Council Cognition and Brain Sciences Unit, Cambridge, England. None of the controls met *DSM–IV* criteria for a major depressive episode according to the SCID, and none reported a history of depression.

Procedure

The procedure was almost the same as for the SAD participants in Experiment 1, using the same version of the AMT. The only differences were as follows: (a) This time, participants were not administered the HRSD–SAD; and (b) the diagnostic interview was the SCID (First et al., 1997) as opposed to a combination of the SCID and additional questions on seasonality. Participants were all tested in the winter months in the United Kingdom (November–February) by the same experimenter (Tim Dalgleish).

Results

The mood and autobiographical memory measures for the two groups of participants are presented in Table 2. One of the SAD participants did not complete the AMT because of becoming too distressed, thus data for this group are for 14 participants only.

Age and Mood Variables

The two groups of participants did not differ on age ($t < 1$) but, as expected, the SAD group scored significantly higher than the controls on STAI–Y1, $t(27) = 5.22$, $p < .0001$, and BDI, $t(27) = 5.02$, $p < .0001$.

[4] The data across groups violated assumptions of both normality and homogeneity of variance.

Table 2
Scores for the Mood and Autobiographical Memory Variables in Experiment 2

	SAD (n = 14)		Controls (n = 15)	
	M	*SD*	*M*	*SD*
BDI**	16.85	9.37	4.00	3.16
STAI–Y1**	44.14	11.85	26.47	5.45
FMGP	1.07	1.27	1.07	0.32
FMGN*	1.07	1.38	1.93	1.33

Note. SAD = seasonal affective disorder; BDI = Beck Depression Inventory; STAI–Y1 = Spielberger State–Trait Anxiety Inventory—State scale; FMGP = number of first memories that were general to positive cues; FMGN = number of first memories that were general to negative cues.
* $p < .05$.
** $p < .001$.

AMT Performance

The generated memories of 10 participants from each group, selected at random, were included in a reliability analysis. Coding of memories as general or specific across two raters (Tim Dalgleish and Jenny Yiend) was very reliable ($\kappa = 0.87$).

The numbers of first memories that were general for the two groups violated the assumptions for ANOVA, thus nonparametric Mann–Whitney analyses were carried out. There was no difference between groups on the mean number of first memories that were general to positive cues, $U = 104.00$, *ns*, but the groups did differ on the mean number of first memories that were general to negative cues, $U = 60.50$, $p < .05$, Cohen's $d = .60$, with the SAD group recalling fewer general memories.

Discussion

The data from Experiment 2 revealed that SAD participants did not produce more general memories, relative to healthy controls, on the AMT. Indeed, they produced fewer memories in the case of negative cues.

This finding that SAD sufferers tended to exhibit less generality in autobiographical memory, relative to the comparison group, suggests that the overgenerality effect is not necessarily a function of all mood disorders. To account for the present data, the type of explanation of overgeneral memory referred to in the introduction (e.g., J. M. G. Williams et al., 1997) would need to suggest that SAD sufferers show an unimpaired ability to inhibit a categorical level of mnemonic search, thereby allowing them to integrate contextual information into the search process. If this is the case, it is important to generate candidate explanations as to why this might be so in SAD but not other mood disorders.

Conclusions

One possible factor in the lack of an overgenerality effect associated with SAD relies on the explanation for the etiology of the effect in nonseasonal depression. Williams (see J. M. G. Williams et al., 1997) has argued that overgenerality is a consequence of a retrieval style used in early childhood as a way of avoiding the processing of specific negative information. This retrieval style then generalizes to include the encoding, storage, and retrieval of all information, including positive events. All of the evidence concerning SAD suggests that it is a predominantly biologically driven mood disorder related to seasonal changes in light–dark levels (Dalgleish et al., 1996) as opposed to early life experiences. It may be that because of this, SAD sufferers do not develop an overgeneral memory style via the route that J. M. G. Williams et al. (1997) have suggested.

A second putative explanatory factor for the lack of an overgenerality effect in SAD rests on the fact that SAD is characterized by mood changes as a function of natural changes in light–dark levels across seasons. Parrott and Sabini (1990), using a similar task to the AMT, showed that healthy volunteers, subjected to a variety of natural mood inductions such as weather changes, generated first autobiographical memories that were incongruent with their mood state. In other words, they generated positive memories when in a negative mood and negative memories when in a positive mood. Parrott and Sabini (1990) explained their data in terms of mood regulation processes that operate in healthy individuals. It is plausible that SAD sufferers represent a group of individuals who are particularly vulnerable to such natural mood changes and therefore exhibit a retrieval style that represents a mood regulation effect and that eliminates the usual overgenerality effect associated with depressed mood.

In summary, our data reveal a lack of overgenerality in autobiographical memory in participants with SAD in relation to comparison groups, indicating that overgenerality is not necessarily a function of all mood disorders. However, within the context of this finding, the number of general memories to positive cue words was still able to independently predict later symptom levels using the HRSD but not the BDI, as evidenced by the data from Experiment 1. This suggests that the generation of general memories is more than an epiphenomenon of being in a depressed state and that it is a marker for some psychological process that is important in determining the course of depression.

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