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BRIEF REPORTS

Emotional Intensity of Idiographic Sad Memories in Depression Predicts Symptom Levels 1 Year Later

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When cued with generic happy and sad words, depressed individuals have been found to articulate contextually impoverished memories of autobiographical events. Although this pattern predicts a worse symptomatic course of disorder in some depressed samples, longitudinal findings with the cue-word paradigm are inconsistent. To address the etiological significance of autobiographical memories outside the cue-word paradigm, the authors used an idiographic interview in which depressed participants generated memories of their happiest and saddest lifetime events. Each memory was coded for detail and emotional intensity. At a 1-year follow-up, participants' levels of depressive symptoms were reassessed. Lower emotional intensity of saddest memories predicted higher levels of depressive symptoms at follow-up. Several implications for understanding sadness and emotional disclosure in depression are discussed.

Keywords: depression, autobiographical memories, emotion, disclosure

Major depression is characterized by specific patterns of memory functioning (Burt, Zembar, & Niederehe, 1995). One pattern that has been the focus of considerable research concerns the relative inability of depressed persons to retrieve specific autobiographical memories when they are cued with generic happy and sad words (e.g., Goddard, Dritschel, & Burton, 1996; Swales, Williams, & Wood, 2001; Williams & Dritschel, 1988). The tendency for depressed persons to offer scriptlike, contextually impoverished, autobiographical memories in response to valenced cue words has been labeled *overgeneral memory* (OM; Williams, 1996). This pattern of memory has been interpreted in terms of a stable affect regulation strategy that allows individuals to minimize the negative affect that might be associated with potentially painful memories, such as those that arise from the experience of childhood adversity (Williams, 1996; Williams, Stiles, & Shapiro, 1999).

To gain a better understanding of OM as a vulnerability factor for depression, several investigators have examined the relation between OM and the symptomatic course of depression. These researchers have used the Autobiographical Memory Test (AMT; Williams & Broadbent, 1986) to assess autobiographical memory. In this procedure, participants are asked to retrieve a specific autobiographical memory (i.e., a time and place where something specific happened to them) in direct response to individual cue words that are presented orally or written on cards; words are typically positive (e.g., *happy, safe*) and negative (e.g., *clumsy, lonely*) in emotional valence. To date, studies in which this procedure has been used have yielded an inconsistent pattern of findings. In two samples, OM in response to positive but not negative cue words predicted higher levels of depression symptoms at follow-up, even after controlling for initial levels of depressive symptoms (Brittlebank, Scott, Williams, & Ferrier, 1993; Dalgleish, Spinks, Yiend, & Kuyken, 2001). In contrast, the results of a similar investigation indicated that OM in response to negative but not positive cue words predicted higher levels of depressive symptoms at follow-up (Peeters, Wessel, Merckelbach, & Boon-Vermeeren, 2002). Finally, Brewin, Reynolds, and Tata (1999) found no relation between OM in response to positive or negative cue words and subsequent levels of depressive symptoms after controlling for initial symptom levels.

Limitations of the Existing Literature

One limitation of previous studies of autobiographical memory is their exclusive reliance on a single procedure, the AMT. The AMT has several features that may cloud efforts to understand the etiological significance of autobiographical memory functioning. For example, there is some indication that the AMT may be sensitive to the degree of impairment of depressed persons (Phillips & Williams, 1997), a factor that is likely to vary across samples. Instability of results using the AMT may also reflect differences in implementation of the AMT across studies. Indeed, the results of a recent meta-analysis (van Vreeswijk & de Wilde,

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2004) suggest that minor procedural variations in the AMT can influence the magnitude of OM effects that are obtained. For example, van Vreeswijk and de Wilde found that smaller effects are obtained when subjects are given less time to respond. Finally, it is possible that features of the AMT exaggerate the magnitude of depression-related memory deficits. For example, the normative cue words that are used in the AMT may be irrelevant to depressed persons' personal concerns, raising the possibility that OM is driven by depressed persons' low engagement with the task (Rottenberg, Hildner, & Gotlib, 2005).

A second limitation of prior studies of autobiographical memory functioning is that they have relied almost exclusively on a single aspect of memory functioning: the amount of specific elaboration, or detail, provided by the participants. Although memory detail is an important aspect of memory functioning, examination of autobiographical memory emotionality is also warranted. For example, theoretical accounts of OM highlight the avoidance of emotion (Williams, 1996; Williams et al., 1999). In addition, findings in the broader literature have linked impaired expression of emotional experiences to poorer subsequent psychological functioning (e.g., Pennebaker, 1997). Lending additional credence to an examination of the emotionality of memories in the prediction of depression course, we have documented connections between diminished emotional reactivity to sad and amusing stimuli and impaired psychological functioning in a prior sample of depressed persons (Rottenberg, Kasch, Gross, & Gotlib, 2002).

The Present Study

To address the broad etiological significance of autobiographical memories outside the cue-word paradigm, we (a) assessed autobiographical memory functioning with an idiographic interview in which depressed participants generated memories of their happiest and saddest lifetime events and (b) examined whether memory detail and memory emotionality predicted the course of depression. Our idiographic memory procedure differs from the cue-word paradigm in four main ways: (a) it focuses on meaningful autobiographical events designed to tap depressed persons' personal concerns (e.g., Beck, 1983); (b) it is conducted in an interactive, interview format; (c) it affords participants several opportunities for memory elaboration; and (d) it does not impose time pressure or time constraints. The level of detail and the level of emotional intensity of each memory were assessed by independent raters. To examine the relation between these variables and the course of depression, we collected data from depressed participants at the initial assessment (Time 1) and again at a 1-year follow-up assessment (Time 2).

On the basis of the general literature on OM and the results of previous studies examining emotion expression in depression, we predicted that lower levels of memory detail and emotional intensity assessed at Time 1 would predict a poorer symptomatic course of depression over a 1-year interval.

Method

Participants

Initial screening. Depressed participants were solicited from two outpatient psychiatry clinics in a university teaching hospital, as well as through advertisements posted in numerous locations within the local community (e.g., Internet bulletin boards, university kiosks, supermarkets). Depressed participants' responses to a telephone interview provided initial selection information. This phone screen established that participants were fluent in English and were between 18 and 60 years of age. Participants were excluded for reported lifetime history of brain injury or primary psychotic ideation, lifetime diagnoses of bipolar disorder, current diagnoses of panic disorder or social phobia, behavioral indications of impaired mental status or mental retardation, or reported signs of alcohol or substance dependence or abuse within the past 6 months.

Diagnosis. Major depressive disorder, the psychiatric label for clinically significant depression, is characterized by at least a 2-week period of persistent sad mood or a loss of interest or pleasure in daily activities, as well as by four or more additional symptoms, such as marked changes in weight or appetite, sleep disturbance, psychomotor agitation or retardation, fatigue, feelings of guilt or worthlessness, and concentration difficulties (American Psychiatric Association [APA], 1994). All currently depressed participants ($N = 26$) met the criteria of the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM–IV;* APA, 1994) for major depressive disorder using the Structured Clinical Interview for *DSM–IV* Disorders (SCID–I; First, Gibbon, Spitzer, & Williams, 1995). SCID–I interviewers had previous experience with administering structured clinical interviews and were trained specifically to administer the SCID–I. In prior work, this team of interviewers achieved good interrater reliability for major depressive disorder ($\kappa = 1.00$; Rottenberg et al., 2002). All participants provided written informed consent prior to the experimental session and were paid $25/hr.

Clinical Measures

Depression severity. In addition to completing the SCID–I, participants completed the Hamilton Depression Inventory (HDI; Reynolds & Kobak, 1995), a self-report version of the interview-based Hamilton Rating Scale for Depression (HRSD; Hamilton, 1960) that has been shown to correlate highly with the clinical interview and has demonstrated high reliability and validity (Kasch, Rottenberg, Arnow, & Gotlib, 2002; Kobak & Reynolds, 2000; Reynolds & Kobak, 1995). The questions on the inventory are virtually identical to the suggested interview questions in the HRSD. In this study, we used the 23-item version. The internal consistency of the HDI was .93 for the present sample.

Psychosocial functioning. The Global Assessment of Functioning (GAF) Scale (*DSM–IV,* Axis V; APA, 1994) was used to assess overall psychosocial functioning. Ratings are made on the basis of the SCID–I interview and range from 1 (*lowest level of functioning*) to 100 (*highest level of functioning*). The GAF Scale is used to evaluate an individual's overall level of psychological, social, and occupational functioning. The reliability of the GAF Scale has been demonstrated in prior work (Endicott, Spitzer, Fleiss, & Cohen, 1976) and with this team of interviewers (Kasch et al., 2002; Rottenberg et al., 2002).

Follow-Up Assessment (Time 2)

Approximately one year after the initial Time 1 assessment, all participants were contacted and current levels of self-reported depressive symptoms were obtained. Participants were also administered a modified version of the SCID–I. On the basis of guidelines recommended by the National Institute of Mental Health Collaborative Program on the Psychobiology of Depression (e.g., Keller et al., 1992),[1] this interview determined whether each participant had fully recovered from depression. At this assessment, participants provided written informed consent and were paid $25/hr.

[1] We had intended to use the SCID–I classifications as the basis for parallel regression analyses in which memory variables were used as predictors of recovery status (recovered, not recovered). Unfortunately, these categorical analyses were not viable because of the low rate of full recovery observed in this sample ($n = 5$).

Autobiographical Memory Procedure

Emotions Interview. The Emotions Interview is a brief (approximately 15 min) semistructured interview designed to elicit details concerning the maximally happy and sad moments experienced by each participant in his or her lifetime (the full text of the Emotions Interview is available on the Web at http://dx.doi.org/10.1037/1528-3542.5.2.238.supp). An initial instructional set requested participants to describe their happy and sad life events, "in enough detail so a person who was not there could understand why this moment was significant for you." Participants were then instructed to describe the happiest event(s) in their lives and were provided with themes that often exemplify happy memories (e.g., having something very lucky happen, having a wonderful thing happen to their families, reaching an important goal). If a participant recalled several events in his or her initial response, the interviewer asked the participant to choose from these events the one that affected the participant most positively. Participants were told to think about a specific moment and to describe it in detail. If the participant initially had difficulty recalling the details of a specific event, the interviewer asked questions to help better establish the context of the event. The interviewer also asked several standardized probe questions in order to provide additional opportunities for the participant to elaborate on the emotional quality of the event, such as, "Can you describe why this event made you feel happy?" and "As you think about this happy event now, what thoughts or feelings come to mind?" A similar procedure was used to elicit participants' saddest life events. With each participant's consent, the interview session was videotaped.

Memory variables. Videotapes of each Emotions Interview were transcribed. All interviewers' references to happy and sad emotional states were expunged from the transcripts to disguise the purpose of the interview. A team of five research assistants who were naive to the aims of the study and blind to participants' diagnostic group assignment coded each memory related in the transcripts for detail and emotional intensity. Detail ratings were based on the amount of elaboration and specific contextual information that participants provided. Ratings of emotional intensity were based on raters' judgments of how happy or sad the participant would be given the language used in his or her event descriptions. At least four research assistants coded each transcript independently. The four coders' ratings were averaged to create one score for each memory for detail and emotional intensity. Interrater reliability was acceptable (all αs $> .7$). All ratings were made on scales ranging from 0 (*not at all*) to 10 (*extremely*).

Results

Clinical Characteristics and Attrition Analyses

The sample consisted of 26 participants diagnosed with unipolar major depressive disorder. On average, the depressed participants were moderately depressed, with an average of 6.8 symptoms ($SD = 1.4$) during their current episode. Approximately two thirds of the participants were receiving outpatient treatment ($n = 17$) and approximately one third were receiving psychotropic medications ($n = 9$). Episodes of depression tended to be recurrent in this sample: The median number of prior episodes among those who were able to enumerate them was 5.5. Participants were predominantly female (77%), Caucasian (85%), and unmarried (72%). The mean age of the sample was 36.7 years ($SD = 8.0$). The sample had a mean education level of 6.9 on an ordinal scale from 1 to 8 (equivalent to some college) and a mean annual income of approximately $50,000. *T* tests conducted on all four memory variables examining the effects of treatment (treated vs. untreated) and medications (medicated vs. medicated) revealed no differences in memory performance as a function of either treatment or medication status (all ps $> .05$).

Follow-up depression severity data were obtained from 19 of the 26 depressed individuals. The 7 participants who were not assessed at Time 2 had disconnected telephone numbers, had expired e-mail addresses, had moved, or failed to provide an additional contact person at Time 1. Post hoc analyses indicated that participants who contributed follow-up data did not differ from participants who were lost to follow-up on Time 1 level of depression severity, $t(23) = .12$, $p > .05$, or on any of the four Time 1 memory variables (all ps $> .05$). Because of scheduling problems and/or difficulty reaching participants by telephone, there was variability in the length of the follow-up interval. It is important to note that all analyses that were significant without considering length of follow-up interval remained significant when interval length was included as a covariate.

Intercorrelations Among Variables

Table 1 presents descriptive statistics and correlations of the memory measures with one another and with the severity of depressive symptoms assessed at both assessments. Not surprisingly, the memory variables showed a moderate degree of intercorrelation (correlations ranged from .27 to .52). It is noteworthy that none of the memory variables was significantly correlated with severity of depressive symptoms at Time 1.

Prediction of Depressive Symptom Levels at Time 2

As might be expected, participants exhibited a reduction in depressive symptomatology between Time 1 and Time 2, $t(17) = 3.97$, $p < .01$. Correlational analyses indicated that the emotional intensity of sad memories was associated with levels of depressive symptomatology at Time 2 ($r = -.46$, $p < .05$). To examine further the specificity of the observed association between the emotional intensity of sad memories at Time 1 and depressive symptomatology at Time 2, we used a multiple regression analysis to control for the shared variance among the memory variables. All of the memory measures were entered into a linear regression analysis predicting depression symptom levels at Time 2. Overall, Time 1 memory variables explained 50% of the variance in the depression symptoms reported at Time 2 ($R = .71$), $F(4, 14) = 3.48$, $p < .05$. As can be seen in Table 2, consistent with the results of the correlational analyses, lower emotional intensity of sad memories at Time 1—and only this variable—predicted more severe levels of depressive symptoms at Time 2 ($\beta = -.86$, $p < .01$).

Our results therefore indicate that the emotional intensity of sad memories is a unique and strong predictor of Time 2 depression symptoms. We conducted two further multiple regression analyses to address whether this association held even after controlling for important aspects of clinical functioning at Time 1. In our first analysis, we entered Time 1 depression severity and Time 1 GAF Scale scores into the model. Emotional intensity of sad memories continued to significantly predict Time 2 depression severity ($\beta = -.45$, $p = .05$). In our second analysis, we repeated this multiple regression analysis with only the subsample of unmedicated participants. As was the case in our previous analysis, the emotional intensity of sad memories significantly predicted Time 2 depression severity ($\beta = -.54$, $p < .05$), a finding that is particularly impressive given the reduced power of the smaller subsample. These results indicate that the emotional intensity of sad memories explains variation in depression outcome above that explained by

Table 1
Variable Correlations and Descriptive Statistics

Variable	1	2	3	4	5	6
1. T1 HDI	—					
2. T2 HDI	.32	—				
3. Happiness detail	.19	.17	—			
4. Happiness intensity	.05	.02	.27	—		
5. Sadness detail	.36	.15	.35	.23	—	
6. Sadness intensity	.12	−.46*	.34	.52*	.34	—
M	34.24	22.63	4.77	7.63	5.36	8.84
SD	6.88	13.41	1.46	1.15	1.78	0.90

Note. T1 = Time 1; T2 = Time 2; HDI = Hamilton Depression Inventory score.
* $p < .05$.

clinical variables that more typically predict the course of depression.

Discussion

The present study addressed the etiological significance of autobiographical memory functioning in depression by assessing the detail and emotionality of autobiographical memories generated with an idiographic procedure. Our principal finding was that low emotionality of sad memories at an initial assessment predicted a higher level of depressive symptoms one year later. This finding is broadly consistent with other findings linking impairments in autobiographical memory functioning to a poorer course of depression, but it is the first such demonstration outside of the cue-word paradigm.

Given the theoretical importance of emotional avoidance in accounts of OM (Williams, 1996; Williams et al., 1999), we measured the level of emotionality of participants' memories as well as level of memory detail. As one might expect, memory emotionality and memory detail were moderately correlated. Nevertheless, for sad memories, memory detail did not predict the course of depression, whereas a measure of memory emotionality did predict depression course, even after controlling for a number of potentially confounding variables. We believe that the discriminative power of the emotionality variable in predicting the course of depression is intriguing and potentially important. Nevertheless, we are cautious in interpreting this finding further until other researchers include measures of memory emotionality in studies of autobiographical memory functioning.

The present findings speak broadly to theories highlighting the adaptive significance of emotions (Keltner & Gross, 1999) and to empirical links between verbal disclosure of negative emotion and improved subsequent psychological functioning (e.g., Pennebaker, 1997). In a narrower but an equally important sense, our findings also suggest that expression of sadness in depression predicts a more benign prospective course of disorder. In a previous study with an independent sample of depressed persons, we found an association between stronger emotional reactivity to sad stimuli and better concurrent functioning (Rottenberg et al., 2002). Using the cue-word paradigm, Peeters et al. (2002) found that highly detailed negative autobiographical memories predicted a more benign course of depression. The current data, collected in a very different paradigm, also indicate a more prominent role for negative, sad autobiographical memories than for happy autobiographical memories in predicting the course of depression. Taken together, these findings suggest that even during an episode of depression, when many (if not most) patients experience problems with sad mood, the capacity to respond to sad events or stimuli with sadness predicts improved psychological functioning, independent of current levels of symptoms.

Table 2
Multiple Regression Analysis for the Prediction of Depression Symptoms at Time 2

Symptom	β	t	p
Happiness intensity	.21	0.88	.365
Happiness detail	.19	0.94	.396
Sadness intensity	−.86	−3.58	.003
Sadness detail	.45	1.87	.082

In closing, we should point out three limitations of our study. First, the study is relatively silent as to the exact mechanisms whereby sadder emotional memories yield a more favorable outcome in depression. More generally, work linking autobiographical memory to clinical disorders has been fundamentally unclear as to whether autobiographical memory processes operate largely within or outside of conscious awareness. For example, although Williams et al. (1999) have conceptualized OM as being a learned strategy of affect regulation, it could also be an automatic regulation mechanism or, alternatively, may contain elements of both types of processing. It would be helpful to add more objective measures to assessments of autobiographical memory functioning, such as reaction time data, psychophysiological measurements, and neuroimaging, in order to better address responsible mechanisms. Second, although our sample size was adequate to detect the effect of sad emotionality on outcome, we may have been limited in our ability to detect smaller effects in the data. Third, it should be noted that this was a naturalistic study of the course of depression. Sad idiographic memories were found to predict outcome even though the depressed participants in this study were heterogeneous with respect to the medications and treatments they received during the follow-up period. Although there was no evidence that the factors related to the use of treatment or medication confounded our results, only random assignment to treatment could rule this out as an explanation for our findings.

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