

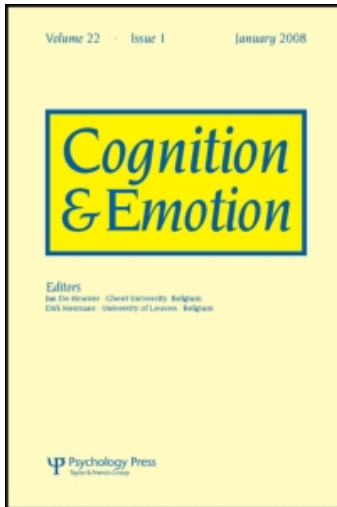
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### Reduced specificity of autobiographical memory as a moderator of the relationship between daily hassles and depression

Rachel J. Anderson <sup>a</sup>; Lorna Goddard <sup>a</sup>; Jane H. Powell <sup>a</sup>

<sup>a</sup> Goldsmiths, University of London, London, UK

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BRIEF REPORT

**Reduced specificity of autobiographical memory  
as a moderator of the relationship between daily  
hassles and depression**

Rachel J. Anderson, Lorna Goddard, and Jane H. Powell  
*Goldsmiths, University of London, London, UK*

Autobiographical memory biases are potential cognitive vulnerability factors for depression, with recent research highlighting the potential importance of accompanying high levels of life stress. Using a prospective design, the current study examined the role of autobiographical memory performance, both reduced specificity and propensity towards categoric memories, as moderators of the relationship between life stress and depression in a non-clinical college sample. Findings suggest that an increased propensity towards categoric recall emerged as a vulnerability factor for future depressive symptoms, with this vulnerability not being dependent upon the presence of high levels of life stress. In contrast, while reduced autobiographical memory specificity did not emerge as a vulnerability factor alone, it did emerge as a moderator of the relationship between chronic daily hassles and depression. These findings highlight the potential importance of both propensity towards categoric recall and reduced specificity of autobiographical memory as vulnerability factors for the experience of future depressive symptoms.

**Keywords:** Autobiographical memory; Depression; Vulnerability; Overgeneral; Life stress.

INTRODUCTION

A growing body of literature has shown that emotional disorders are associated with autobiographical memory biases (see Williams et al., 2007,

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Correspondence should be addressed to: Rachel Anderson, Faculty of Health, Leeds Metropolitan University, Leeds LS1 3HE, UK. E-mail: r.anderson@leedsmet.ac.uk

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for a review). In particular, individuals with depression exhibit difficulties retrieving specific memories pertaining to events with a duration of less than one day (e.g., "I went to the cinema yesterday"). Instead, they recall categoric memories, which represent a summary of repeated events (e.g., "I used to go to the cinema a lot"). Such responses are normally elicited using emotion cue words (e.g., "happy", "lonely"), with the participant required to retrieve memories at speed. This overgeneral memory bias has also been found in suicidal individuals (e.g., Williams & Broadbent, 1986), and individuals experiencing subclinical levels of depression (e.g., Goddard, Dritschel, & Burton, 1997). While it has also been associated with trauma-related anxiety disorders (e.g., McNally, Litz, Prassas, Shin, & Weathers, 1994), it is generally not associated with anxiety after controlling for the influence of comorbid depressed mood (e.g., Wenzel & Jordan, 2005).

Williams (2006) outlined three factors that have emerged as critical mechanisms underlying the phenomenon of overgeneral memory, which may contribute individually, or in combination, to influence autobiographical memory specificity. First, since autobiographical memory retrieval involves a generative process requiring supervisory executive processes (e.g., Conway & Pleydell-Pearce, 2000), a reduced central executive capacity may result in a truncated search. Second, semantic overlap between current concerns and the cues being used to search memory can trigger rumination. Finally, overgeneral memory may be a result of functional avoidance. Williams (1996) proposed that individuals who experience negative events may learn that the negative affect associated with these events can be minimised and regulated if the events are retrieved in a less specific way. However, while this may prove adaptive in the short term, over time, overgeneral memory impacts negatively upon an individual's problem-solving ability resulting in emotional distress due to failed problem-solving attempts (Raes, Hermans, de Decker, Eelen, & Williams, 2003). Thus, rather than occurring as merely an epiphenomenon of depressive symptomatology, an overgeneral retrieval style has been posited as a stable cognitive marker of vulnerability for depressive symptoms/disorder.

Research demonstrates that an overgeneral retrieval style is a vulnerability factor for depressive illness. A number of studies have established that overgeneral retrieval persists into remission (e.g., Peeters, Wessel, Merckelbach, & Boon-Vermeeren, 2002) while other studies using prospective longitudinal designs have shown overgeneral memory to predict future depressive symptoms (e.g., Gibbs & Rude, 2004; Mackinger et al., 2004; Mackinger, Loschin, & Leibetseder, 2000; van Minnen, Wessel, Verhaak, & Smeenk, 2005). Recently, research has begun to examine the role of overgeneral memory as a vulnerability factor within the context of high life stress. This development is particularly pertinent with respect to the onset of depressive symptoms. In non-clinical populations, where rates of non-

specific memory and negative affectivity are often more subtle, cognitive vulnerability factors may only become relevant when in the context of high life stress. Cognitions relating to life stress may reduce working memory capacity by competing for attentional resources (Klein & Boals, 2001), thus making effortful tasks such as specific memory retrieval more difficult. Moreover, as reduced specificity is thought to impact negatively upon social problem-solving ability, it may, in turn, result in poorer coping responses to life stress. Mackinger et al. (2000) found that propensity towards categoric retrieval emerged as a predictor of negative affectivity post-childbirth, while van Minnen et al. (2005) found that reduced specificity predicted both anxious and depressive symptoms following failed IVF treatment. Within a college population Gibbs and Rude (2004) found that a categoric retrieval style moderated the relationship between the experience of stressful life events and depressive symptoms.

However, despite these studies indicating the potential importance of overgeneral memory as a vulnerability factor for emotional distress within the context of high life stress, issues remain. First, it is important to replicate findings that establish the relationship between high life stress and overgeneral memory in non-clinical populations. This is particularly pertinent given the small sample size in the previous study by Gibbs and Rude (2004). Second, it is feasible that different types of life event may be more pertinent in promoting the “high stress” environment under which memory biases emerge as vulnerability factors. Some studies have found chronic daily stressors/hassles—e.g., persistent arguments with one’s partner, increased pressure at work—to be superior predictors of psychopathological symptoms than major life events—e.g., divorce, birth/death of family members (e.g., Monroe, 1983). Furthermore, within a college sample it is likely that the experience of chronic daily hassles will be both more frequent and varied than that of major life events. Thus, the current study investigated whether autobiographical memory performance moderates the relationship between life stress and emotional distress, using an index of chronic daily hassles. Finally, while some studies have highlighted the importance of a propensity towards categoric memories (e.g., Gibbs & Rude, 2004), others have focused on reduced specificity (e.g., van Minnen et al., 2005). In order to overcome this inconsistency, the current research focused on the role of both specific and categoric memories as predictors of future emotional distress.

The aim of the current study was to examine the role of autobiographical memory performance as a vulnerability factor for future depressive symptoms in a non-clinical sample. In line with theory, it was predicted that overgeneral memory would predict future symptoms of depression. The study also explored the role of autobiographical memory performance as a moderator of the relationship between chronic daily hassles and depression. Based upon the findings of Gibbs and Rude (2004) it was hypothesised that

reduced specificity and/or increased categoric recall would be a particular liability under stressful conditions, thus autobiographical memory deficits at Time 1 would moderate the relationship between life stress over the intervening three-month period and depressive symptomatology at Time 2.

## METHOD

### Design and participants

The study employed a longitudinal prospective design, with participants completing two testing sessions approximately three months apart. One-hundred fifty college students agreed to participate, although 12 withdrew having only completed the first testing session. Data was screened for participants with scores on any of the measures falling 3 *SDs* above or below the mean. This screening revealed three outliers, and these were removed for the purposes of analysis. Thus, data from 135 participants was used for data analysis. This sample of participants comprised 24 males and 111 females, ranging from 18 to 48 years ( $M = 22.23$ ;  $SD = 6.78$ ) Recruitment advertisements specified that participants must not be receiving treatment for depression or anxiety.

### Materials

*Beck Depression Inventory.* The BDI (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) is a 21-item self-report measure assessing depressive symptomatology over the previous week. For each of the 21 items, individuals rate the severity of the symptom on a scale of 0 to 3. A higher score is indicative of more depressive symptomatology. The BDI demonstrates high internal consistency with alpha coefficients ranging from .73 to .92. It also has good test-retest reliability correlations ( $r = .75$ ) after one week (Beck, Steer, & Garbin, 1988).

*Survey Recent Life Experiences.* The SRLE (Kohn & Macdonald, 1992) is a self-report inventory containing 51 items and is intended as a measure of accumulation of hassles over the course of a three-month period. Participants are asked to rate the extent to which each item has been a part of their life over the stated time period. Responses are scored on Likert-type scales from 1 (*not at all*) to 4 (*very much*), with total scores summed to provide a possible total score in the range of 51 to 204. Higher scores indicate greater experiences of hassles over the preceding three-month period. Items on the inventory can be grouped into six subscales, indexing social and cultural differences (e.g., “conflict with friends”), work (e.g., “finding your work too demanding”), time pressure (e.g., “unwanted interruption of your

work”), finance (e.g., “financial burdens”), social acceptability (e.g., “social isolation”) and social victimisation (e.g., “being let down or disappointed by friends”). The SRLE demonstrates high internal consistency ( $\alpha = .89$ ; de Jong, Timmerman, & Emmelkamp, 1996), and separate gender analyses support the reliability and validity of the inventory for both genders (Kohn & Macdonald, 1992).

*Autobiographical Memory Test.* The AMT (Williams & Broadbent, 1986) was administered orally to each participant individually. The test required participants to retrieve memories of specific events as quickly as possible in response to cue words provided by the experimenter. Participants were presented with four practice words and ten test words. For each item they were asked to provide a specific memory that relates to one particular day in their past, and were provided with examples of correct and incorrect memories. Of the ten test words, five were positive (Happy, Safe, Interested, Successful and Surprised) and five were negative (Sorry, Angry, Clumsy, Hurt and Lonely). They were presented in the order listed above, with positive and negative words alternately. The first response to each cue word was categorised as specific (referring to a particular place at a particular time, not lasting more than one day), categoric (referring to a category of events containing a number of specific episodes), extended (referring to one specific event that lasted longer than one day) or a semantic associate. When the individual failed to provide any response within 60 seconds, an omission was recorded. All responses were rated by the first author, and an independent rater scored 26% of responses. Interrater reliability was acceptable (Cohen’s kappa = .93).

## Procedure

Participants completed two testing sessions, with the initial session (T1) taking place in the first term of the academic year (October to December). Participants completed the BDI and the AMT at this session. The second testing session (T2) took place in the second term (January to March). The mean time between testing sessions was 96.46 days ( $SD = 4.12$ ). All participants completed the BDI and the SRLE on this occasion.

## RESULTS

### Descriptive statistics

The number of responses falling into each of the five memories categories was calculated (Specific:  $M = 8.66$ ,  $SD = 1.40$ ; Categoric:  $M = 0.59$ ,  $SD = 0.88$ ; Extended:  $M = 0.59$ ,  $SD = 0.88$ ; Semantic Associate:  $M = 0.67$ ,

$SD = 0.25$ ; Omission:  $M = 0.67$ ,  $SD = 0.25$ ). For the purposes of analyses the number of specific and categoric memories were calculated as a proportion of the number of memories retrieved (i.e., excluding omissions), with descriptive statistics and intercorrelations displayed in Table 1. As previous research suggests differences between men and women in reported levels of negative affect (e.g., Nolen-Hoeksema, 1987) and stressful life events (Kendler, Thornton, & Prescott, 2001), the variables were explored for gender differences. No gender differences were found ( $p < .05$ ) and the male and female data were collapsed into one sample for the analyses. BDI scores at T1 and T2 were highly correlated, with higher levels of reported chronic daily hassles at T2 (SRLE) also correlating with symptoms of depression at both time points. However, neither measure of autobiographical memory specificity (AMT categoric memories or AMT specific memories) was significantly correlated with BDI or SRLE scores at either time point.

### Autobiographical memory performance as a moderator of the relationship between chronic daily hassles and depressive symptoms

In order to correct for a mild degree of skew in the data, all variables used in the regression analyses were transformed by square root and mean-centred to correct mild collinearity. The role of autobiographical memory performance (specific and categoric recall) as a predictor of future depressive symptoms, and as a moderator of the relationship between chronic daily hassles and depression, was explored using two hierarchical multiple regression analyses. In both analyses, variables were entered in four stages. To control for pre-morbid levels of emotional distress, BDI T1 scores were entered into both regressions at step one, with SRLE T2 scores entered at step 2. The SRLE involves self-report of stressful events in the preceding three months, thus the scores obtained on these measures at the second testing session provided an indication of the level of daily hassles in the time between the two testing sessions. Autobiographical memory performance (number of categoric *or* specific memories as a proportion of the total number of memories retrieved) was entered at step three, with the corresponding autobiographical memory performance  $\times$  SRLE T2 interaction term at step four.

Following the significant variance accounted for by BDI T1 ( $R^2 = .32$ ,  $\beta = .40$ ,  $p < .001$ ), the experience of chronic daily hassles added significantly to the variance at step two of the analyses ( $\Delta R^2 = .10$ ,  $\beta = .36$ ,  $p < .001$ ).

The number of categoric memories as a proportion of the total number of memories retrieved emerged as a significant predictor of future depressive symptoms, after both pre-morbid levels of depressive symptoms and the experience of daily hassles over the intervening three months had been

TABLE 1  
 Descriptive statistics and intercorrelations between autobiographical memory performance, life stress, and symptoms of depression  
 ( $n = 135$ )

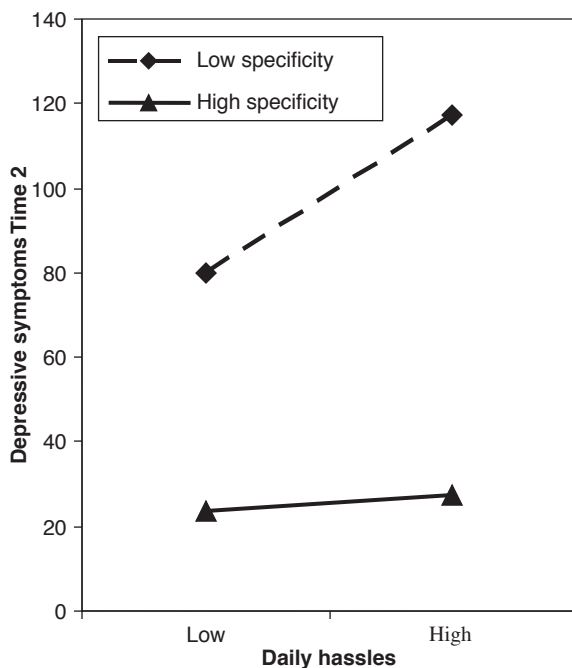
		1	2	3	4	5	<i>M</i>	<i>SD</i>
1	AMT specific memories (proportion exc. omissions)						0.88	0.14
2	AMT categoric memories (proportion exc. omissions)	-.68*					0.06	0.09
3	SRLE T2	-.08	-.06				86.84	19.20
4	BDI T1	.02	-.08	.42*			8.43	6.30
5	BDI T2	.03	.20	.57*	.62*		7.69	7.14

Note: \* $p < .01$ .



accounted for ( $\Delta R^2 = .03$ ,  $\beta = .17$ ,  $p < .01$ ). However, the interaction term (AMT categoric memories  $\times$  SRLE) did not emerge as a significant predictor of future depressive symptoms ( $\Delta R^2 = .00$ ,  $\beta = .47$ ,  $p = .46$ ).

The number of specific memories as a proportion of the total number of memories retrieved did not emerge as a significant predictor of future depressive symptoms after controlling for pre-morbid levels of depression and the experience of stress over the intervening three month period ( $\Delta R^2 = .01$ ,  $\beta = .09$ ,  $p = .19$ ). However, the interaction term (AMT specific memories  $\times$  SRLE) did emerge as a significant predictor of future depressive symptoms ( $\Delta R^2 = .01$ ,  $\beta = -1.76$ ,  $p < .05$ ). This suggests that higher levels of depressive symptomatology at T2 were reported by those experiencing higher frequencies of chronic life stress over the preceding 3 months, but the influence of chronic life stress on depression was greater for individuals who also exhibited reduced autobiographical memory specificity at T1 (Figure 1).



**Figure 1.** Visual representation of interaction effect between daily hassles and memory specificity as a predictor of future depressive symptoms.

## DISCUSSION

Consistent with predictions, propensity towards categoric retrieval significantly predicted future levels of depressive symptoms. These results are in line with findings that have consistently found overgeneral memory to characterise, and act as a trait marker of vulnerability for, depressive illness, and provides further support for the proposition that the same processes that work in clinically depressed persons are active within non-clinical populations (e.g., Gibbs & Rude, 2004; Goddard et al., 1997; van Minnen et al., 2005).

Previous research has suggested that the effects of an overgeneral retrieval style may be a particular handicap at times of high life stress, with the interaction term between number of categoric memories and stressful life events being found to be a significant predictor of future depressive symptoms in a sample of college students (Gibbs & Rude, 2004). However, the current study was unable to replicate these findings; while a categoric retrieval style emerged as a vulnerability factor for future depressive symptoms, this vulnerability was not dependent upon the presence of high levels of chronic daily hassles. One explanation for the non-significant findings may be a lack of power within the current study. It should, however, be noted that Gibbs and Rude's previous study included fewer participants ( $n = 89$ ) than the current investigation ( $n = 135$ ). The current study did find that reduced access to *specific memories* may be important as a vulnerability factor when levels of chronic life stress are high, as the interaction between number of specific memories and the experience of daily hassles emerged as a predictor of future depressive symptoms.

The emergence of overgeneral memory and/or reduced specificity as a vulnerability factor for depressive symptoms in the context of high life stress is an important development within the recent literature. It is particularly pertinent in non-clinical populations, such as college students, where rates of non-specific memory and negative affectivity are often more subtle. In these populations cognitive vulnerability factors may only become relevant when in the context of high life stress. As discussed previously, reduced specificity is thought to impact negatively upon social problem-solving ability, which may, in turn, result in poorer coping responses to life stress. Moreover, cognitions relating to life stress may reduce working memory capacity by competing for attentional resources (Klein & Boals, 2001), thus making effortful tasks such as specific memory retrieval more difficult.

However, the current study suggests that the role of reduced access to specific memories may only become evident when accompanied by high levels of stressful life events, as specific recall did not emerge as a predictor of future depressive symptoms when entered into the regression analysis alone. One possible explanation is that a tendency towards categoric retrieval

clutters working memory and increases a ruminative self-focus, which in turn impacts upon depressive symptoms directly. In contrast, reduced specificity on its own, where the individual tends not to recall events at all or recalls more general extended events, does not cause a major handicap in many instances; however, when the individual experiences higher levels of life stress and problems, which require a database of specific memories to aid resolution, the individual experiences difficulty and, in turn, becomes predisposed to psychological distress. This proposal requires further investigation.

The current study had certain limitations that need to be taken into account when interpreting the findings, and raise issues to be addressed by future research. First, although the sample was drawn from a non-clinical population, it did include individuals with a range of depressive symptoms at the first testing session. While care was taken to ensure that no participants were receiving treatment for depressive illness or anxiety disorders, it still limits the conclusions that one can draw about the onset of depression. A second consideration is the limited number of participants who had actually developed depressive symptoms at the second testing session. A final factor to be taken into account is the reliance on self-report inventories/checklists as indices of stressful life events. While these provide a time efficient mechanism of establishing the major life events and chronic daily hassles experienced by participants, they have a number of limitations. They suffer from the general subjectivity issues that hamper all self-report methods of data collection; in particular, they may index an individual's perception and interpretation of the event, rather than the event occurrence itself. Furthermore, they provide limited information about the event occurrences themselves, such as the context of the event, the extent of threat, or the degree of interdependence of events.

In conclusion, the current study provided support for the role of autobiographical memory performance as a predictor of future depressive symptoms within a non-clinical sample. Specifically, it highlighted the role of a propensity towards categoric memories, rather than a reduction in specific memories, as a vulnerability factor for future symptoms. However, reduced specificity did seem to function as a vulnerability factor when in the presence of high levels of chronic life stress. These findings suggest that further investigation, using larger sample sizes to overcome any potential power issues, are required in order to fully delineate the role of specific and categoric autobiographical memories with respect to depression vulnerability.

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