Autobiographical Memory Specificity and Affect Regulation: An Experimental Approach

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This study investigated J. M. G. Williams's (1996) affect-regulation hypothesis that level of specificity of autobiographical memory (AM) is used to minimize negative affect. It was found that a negative event leads to more reports of subjective stress in high- as compared with low-specific participants. Also, afterward, high-specific participants rated their unprompted memories for the event as more unpleasant. The results indicate that, relative to high specificity, being less specific in the retrieval of AMs is associated with less affective impact of a negative event. Results are discussed within the affect-regulation model. It is suggested that future research take a more functional perspective on AM specificity.

Numerous studies have been published on the specificity of autobiographical memory (AM) since Williams and Broadbent (1986) first found that suicide attempters showed difficulty in retrieving specific memories. Instead, suicide attempters tended to recall more overgeneral memories. In that study, and in all subsequent research, memory specificity has been tested by means of the Autobiographical Memory Test (AMT; Williams & Broadbent, 1986). For a number of cue words, the respondent has to retrieve a specific memory that the cue word reminds him or her of (e.g., "The moment I told my mother I dropped out of college to pursue a career as a rock singer" to the cue *honest*).

Throughout the years following this research, the phenomenon of overgeneral memory has been observed in a variety of patient groups, for example, in people with major depressive disorder (MDD; for a

review, see Williams, 1996). However, to date, overgenerality does not seem to be a characteristic of anxiety disorders (ADs; Burke & Matthews, 1992; Wilhelm, McNally, Baer, & Florin, 1997). That overgenerality is linked to MDD rather than AD was confirmed by Wessel, Meeren, Peeters, Arntz, and Merckelbach (2001). However, overgenerality has been observed in the two ADs that follow stressful events, namely posttraumatic stress disorder (McNally, Lasko, Macklin, & Pitman, 1995) and acute stress disorder (Harvey, Bryant, & Dang, 1998).

Aside from the strong link with MDD, research also seems to suggest an association with trauma. Several studies have shown that lack of specificity (or overgenerality) is related to past trauma experience (Dalgleish et al., in press; de Decker, Hermans, Raes, & Eelen, 2003; Henderson, Hargreaves, Gregory, & Williams, 2002; Hermans et al., 2002; Kuyken & Brewin, 1995). Although some studies have not replicated this association (e.g., Wessel et al., 2001), the balance of evidence suggests a relation between trauma and overgeneral memory.

AM Specificity and Affect Regulation

One hypothesis to account for this overgeneral memory–trauma relation was suggested by Williams (1996) and is referred to here as the *affect-regulation hypothesis*. The idea is that individuals who experience negative events in their childhood learn that by retrieving painful memories in a less specific way, they minimize the negative affect attached to these

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memories. Retrieving memories less specifically, then, is negatively reinforced by avoiding negative affect and, hence, could be regarded as a cognitive avoidance strategy (Hermans & de Decker, 2001).

To date, the evidence for the trauma–overgeneral memory relation and for the affect-regulation model remains largely confined to correlational studies. For example, the affect-regulation model has not yet been submitted to experimental test. The experiment reported here was designed to begin to fill this gap. Our aim was to obtain more evidence for Williams’s (1996) model. More specifically, we examined whether individuals who use a less specific retrieval style are less affected by a negative event. Such a retrieval style might be deemed functional. The impact of memory style on the aftereffects of the negative event was also investigated. If reduced memory specificity truly does represent something functional, then it should also be expected to protect individuals after the event.

Method

Participants

An AMT was administered in a group setting to 294 first-year psychology students at the University of Leuven, Leuven, Belgium. On the basis of their specificity scores on the AMT, 26 high- and 26 low-specific students (all women) were invited to participate in return for course credit. High-specific students were those who retrieved a specific memory for each of the 10 cue words, whereas low-specific students retrieved only six or fewer specific memories. Twenty-four high-specific and 19 low-specific students took part (mean age = 18.44 years, $SD = 0.63$, range = 18–20 years).

Materials

AMT (Williams & Broadbent, 1986). The AMT was used in a written and an oral format for the group screening and the experiment, respectively.¹ In the written format, participants were given a booklet. On each page, a cue word was printed. The first two cues were practice items (*grass, bread*). The next 10 pages had the test words: *confidence (trust), scared, pleasurable, angry, courage, sad, calm (at ease), surprised, bold, and stupid*. Participants were asked to write down a specific memory for each cue (i.e., referring to one particular occasion or event that happened to them on a particular day). When the 60-s time limit for a cue was reached, participants were instructed to turn to the next cue.

In the oral AMT, participants were again asked to recall a specific memory to 10 words: *friendly, angry, energetic, alone, calm, boredom, social, guilty, honest, and cowardly* (practice words: *bike, lens*). Participants were given 60 s for each cue. This time, they did not have to write down their responses.

Each response was coded as either a specific memory or a nonspecific memory. Nonspecific memories were qualified as either a categoric memory (e.g., “Listening to my favorite radio show on Sunday evenings”), an extended memory (e.g., “My holiday in Senegal last year”), no memory (e.g., a verbal association to the cue), no response, or same event (referring to an event already mentioned). The dependent variable was the number of specific responses (specific first responses in the oral format). A second independent rater scored a random sample of 20% of the oral AMT responses. Good interrater agreement (98.8%; $\kappa = .96$) was found for the categorization of specific versus nonspecific responses.

We instructed participants to retrieve specific memories rather than just memories because the affect-regulation hypothesis is about the level of specificity of memories being retrieved and not about the number of memories and because these are the standard instructions of the AMT as it is being used in this research tradition.

Frustration manipulation. Frustration was manipulated through the use of the Tangram Puzzle Task (TPT), consisting of puzzle pieces that need to be correctly assembled to form complex patterns. Two versions were used, each consisting of 15 patterns. In the difficult version, the patterns were presented as homogeneous black figures. In the easy version, white lines indicated the position of the puzzle pieces. The TPT was presented as an intelligence test. Participants were told that they should be able to assemble at least six puzzles within 15 min. In the difficult version, this was an impossible mission (frustration condition). In the easy version, all patterns could be easily completed within time (no frustration condition).²

¹ The Dutch words can be obtained from Filip Raes.

² A pilot study indicated that frustration (and corresponding distress) can be successfully manipulated with the TPT and also suggested that level of distress varied, depending on the level of memory specificity: The frustrating event tended to cause more distress in high-specific individuals as compared with low-specific individuals. A 2×2 (Specificity $\times$ Frustration) ANOVA on a subjective distress measure yielded a marginally significant interaction ($p = .07$).

State-Trait Anxiety Inventory, State version (STAI-S; Van der Ploeg, Defares, & Spielberger, 1980).

This measure was used to assess state anxiety. It has good validity and reliability (Van der Ploeg et al., 1980).

Visual Analogue Mood Scales (VAMS; McNally, Litz, Prassas, Shin, & Weathers, 1994). Participants were asked to indicate their current mood by placing a cross along each of seven horizontal lines, ranging from 0 (*not at all*) to 100 (*extremely*). Each 0–100 scale had one mood adjective: *happy, sad, anxious, angry, emotionally aroused, in a positive mood, and in a negative mood*.

Impact of Puzzle Task Scale (IPS). To assess subjective distress, we developed the IPS. Fifteen items are rated on a 4-point scale (ranging from *not at all* to *very much*) for the extent to which they are experienced during the TPT (e.g., “I was no longer able to think clearly,” “I tried not to get upset”). Responses are scored 0, 1, 3, and 5. The total score ranges from 0 to 75 (with higher scores indicating greater distress). The IPS was modeled on the Impact of Event Scale (IES; Horowitz, Wilner, & Alvarez, 1979; Brom, Kleber, & Defares, 1986). Whereas the IES consists of two subscales (Intrusion and Avoidance), exploratory factor analysis indicated that the IPS is a unidimensional measure with good internal consistency ($\alpha = .88$).

Visual Analogue Impact Scales (VAIS). By placing a cross along three horizontal lines, ranging from 0 (*not at all*) to 100 (*very much*), participants indicated (a) to what extent they were still thinking about the TPT afterward (Intrusion; VAIS-I), (b) to what extent they experienced this thinking back as unpleasant (Unpleasantness; VAIS-U), and (c) to what extent they tried to suppress these thoughts (Avoidance; VAIS-A).

Procedure

All participants were tested individually. The experiment was presented as consisting of two separate validation studies. The first study was introduced as a validation study of an intelligence test and consisted of the TPT. Participants in each specificity group were randomly assigned to either the frustration (difficult TPT) or the no frustration (easy TPT) condition. They completed the STAI-S and the VAMS twice: once before and once after the TPT (with reference then to one's feelings during the TPT). Next, the AMT was administered to examine the stability of memory specificity. On completion of the IPS and VAIS, participants were thoroughly debriefed.

Results

Group Differences

The STAI-S and the VAMS were administered before the frustration manipulation as well, to check for differences between both specificity groups that might explain other crucial differences (e.g., on the IPS). However, no such differences were found. Also, both groups did not differ in the time needed to complete all puzzles (no frustration condition), nor did they differ with regard to the total number of puzzles completed (frustration condition).

Memory Style as a Stable Characteristic

The number of specific responses on the written AMT was significantly correlated with the number of specific first responses on the oral AMT, $r(43) = .55$, $p < .01$. The level of specificity, then, appears to be a stable characteristic of memory retrieval.

Manipulation Check

There was a greater increase in state anxiety (STAI-S change score) in the frustration condition than in the no frustration condition, $F(1, 39) = 35.70$, $p < .01$. Except for Emotionally Aroused ($p = .12$), there was a significant main effect of frustration for all VAMS change scores (all $ps < .05$). In the frustration condition, positive and negative affect decreased and increased, respectively, to a greater extent than in the no frustration condition.

Impact of Frustration and Memory Specificity

Subjective stress (IPS). A 2×2 (Specificity $\times$ Frustration) analysis of variance (ANOVA) was performed on the IPS scores. This ANOVA yielded a significant main effect of frustration, $F(1, 39) = 38.63$, $p < .01$: IPS scores were higher in the frustration ($M = 25.67$, $SD = 10.41$) than in the no frustration condition ($M = 8.68$, $SD = 7.30$). The effect of specificity was not significant, $F(1, 39) = 1.32$, $p = .26$. Of most importance, the ANOVA revealed the predicted significant Specificity $\times$ Frustration interaction, $F(1, 39) = 5.56$, $p < .05$ (see Figure 1). One-degree-of-freedom contrasts showed that the specificity effect was significant in the frustration condition, $F(1, 39) = 5.98$, $p = .02$ (high specificity $M = 29.58$, $SD = 10.71$; low specificity $M = 20.44$, $SD = 7.72$), but not significant in the no frustration condition ($F < 1$; high specificity $M = 7.25$, $SD = 3.93$; low specificity $M = 10.40$, $SD = 9.97$). The interaction could also be illustrated as follows: The frustration led to a significant increase in subjective

Figure 1. Mean Impact of Puzzle Task Scale (IPS) scores for the high- and low-specific participants as a function of frustration condition. Solid bars represent frustration; open bars represent no frustration.

stress in the high-specific group, $F(1, 39) = 41.66$, $p < .01$, whereas a far less impressive increase was observed in the low-specific group, $F(1, 39) = 6.65$, $p < .05$.

VAIS. A 2×2 (Specificity $\times$ Frustration) ANOVA on VAIS-I ratings yielded a marginally significant interaction, $F(1, 39) = 3.70$, $p = .06$. Post hoc Tukey's honestly significant difference (HSD) test for unequal N showed that high-specific participants reported significantly more intrusions in the frustration condition ($M = 53.10$, $SD = 33.26$) than in the no frustration condition ($M = 16.40$, $SD = 17.84$; $p < .01$). In the low-specific group, frustration did not lead to a significant increase in thinking back to the TPT ($p < .97$; frustration condition $M = 32.0$, $SD = 27.59$; no frustration condition $M = 26.0$, $SD = 21.86$).

Of more importance, the 2×2 ANOVA on the VAIS-U ratings revealed a significant interaction, $F(1, 39) = 9.30$, $p < .01$ (see Figure 2).

Post hoc Tukey's HSD for unequal N revealed that thinking back to the TPT was rated as more disturbing in the frustration condition than in the no frustration condition for both the high-specific group ($p < .01$; frustration $M = 69.8$, $SD = 18.02$; no frustration $M = 7.8$, $SD = 5.27$) and the low-specific group ($p < .01$; frustration $M = 41.0$, $SD = 31.11$; no frustration $M = 12.6$, $SD = 10.07$). However, within the frustration condition, high-specific participants thought it more unpleasant to find themselves thinking back than did the low-specific participants ($p < .01$). The interaction remained significant when VAIS-I scores or IES scores were included as a co-

Figure 2. Mean Visual Analogue Impact Scale (VAIS)-Unpleasantness ratings for the high- and low-specific participants as a function of frustration condition. Solid bars represent frustration; open bars represent no frustration.

variate. Thus, independent of frequency of thinking back (VAIS-I) and independent of the amount of distress during the event (IES), high-specific individuals do seem to experience more distress as a result of having these thoughts. As for the VAIS-A scale, there was no Specificity $\times$ Frustration interaction ($F < 1$).

Discussion

To our knowledge, this is the first time that the affect-regulation account for the overgeneral AM phenomenon has been submitted to an experimental test. The main observation is that a negative event leads to a greater increase in distress in high-specific individuals than in low-specific individuals. Also, in the immediate aftermath of the event, high-specific individuals tend to think back more often to the negative event and experience having these thoughts as more distressing.

The results seem to point to the possibility that being less specific in memory retrieval has a positive effect on the affective impact of a negative event and, thus, appears to have some affect-regulating qualities as proposed by Williams (1996). The results might be illustrating the payoff for individuals who are less specific: a reduced sensitivity (immunization?) to (future) frustration. This could be seen as an extension to Williams's (1996) original affect-regulation hypothesis: Being less specific not only regulates affect associated with past adversities but also makes one less vulnerable to future negative events.

The fact that a negative event leads to greater distress in high-specific individuals is an interesting find-

ing. To date, the prevailing idea within this research domain is that high memory specificity is related to emotional health, whereas lack of specificity is linked to emotional problems. Only very sparse data are yet reported that contradict this idea. Swales, Williams, and Wood (2001) reported a positive correlation between specificity and hopelessness and depression. In a sample of patients with borderline personality disorder, Startup et al. (2001) found overgenerality to be inversely related to the number of parasuicidal acts. These authors tentatively concluded that in these patients, overgeneral retrieval may have some sort of "adaptive function to protect the individual from the build-up of the kinds of thoughts, memories, and feelings that spiral to cause self-harm" (Startup et al., 2001, p. 117).

Following Startup et al. (2001), our data might be seen as a further plea for a shift in perspective on the AM phenomenon away from merely looking at it as something linked to emotional problems (deficit model) toward a more functional approach. It appears that being less specific in some cases is advantageous—at least in the short run—and might be termed as functional, protective, or adaptive. In the long run, however, this reduced specificity may very well prove to be maladaptive and to have detrimental effects. In this regard, we refer to previous research suggesting a link between reduced specificity and deficits in problem solving (e.g., Goddard, Dritschel, & Burton, 1996), difficulty imagining the future (Williams et al., 1996), various psychiatric diagnoses (see above), and a poor prognosis in MDD (e.g., Brittlebank, Scott, Williams, & Ferrier, 1993).

This is similar to the pattern observed in clinical research, suggesting that exposure to disturbing memories and feelings is associated with long-term benefit, although such confrontation might be distressing in the short run. For example, work by Pennebaker and Seagal (1999) suggests that when people confront a past traumatic event (by keeping a diary), they initially feel a substantial amount of distress. However, in the long run, such confrontation leads to improvements in mental and physical health.

As already stated, retrieving memories in a less specific way may be regarded as a cognitive avoidance strategy, negatively reinforced by some immediate, albeit possibly short-lived, positive consequences. However, as for any other problem behavior, negative consequences typically evolve in the long run. Only future research, in particular, longitudinal research, can tell us whether this functional approach is a fruitful way of looking at memory specificity.

In closing, we would like to point to a limitation of the present study. Because we selected participants on the basis of a measured variable (AMT), we cannot exclude the notion that a possible third variable might be responsible for the observed effects. However, recall that high- and low-specific individuals did not differ on anxiety and mood ratings prior to the frustration manipulation. Also, post hoc, the Conscientiousness subscale of the NEO-Five Factor Inventory (Costa & McCrae, 1992) and the Achievement Motives Scale (Nygård & Gjesme, 1973) measuring the motive to seek success and the motive to avoid failure were administered via mail.³ People who are highly conscientious and/or scoring high on achievement motives might be more affected by a failure experience and at the same time perform better on the AMT. Again, however, no differences were found on these variables between high- and low-specific individuals. Still, to show a causal effect of memory style on affect regulation, one would need to manipulate level of memory specificity. Also, we need to examine whether low-specific individuals report relatively less positive affect in response to a positive experience. Because the affect-regulation hypothesis gives the regulation of negative affect as the origin of the overgenerality phenomenon, once it has generalized to positive memories, one would predict that positive affect would be attenuated also (Williams, 1996).

³ Dutch versions by Hoekstra, Ormel, and de Fruyt (1996) and by Lens and Baeyens (1991).

References

- Brittlebank, A. D., Scott, J., Williams, J. M. G., & Ferrier, I. N. (1993). Autobiographical memory in depression: State or trait marker? *British Journal of Psychiatry*, 162, 118–121.
- Brom, D., Kleber, R. J., & Defares, P. B. (1986). *Traumatische ervaringen en psychotherapie* [Traumatic experiences and psychotherapy]. Lisse, the Netherlands: Swets & Zeitlinger.
- Burke, M., & Matthews, A. (1992). Autobiographical memory and clinical anxiety. *Cognition and Emotion*, 6, 23–35.
- Costa, P. T., & McCrae, R. R. (1992). *Revised NEO Personality Inventory (NEO-PI-R) and the Five Factor Inventory (NEO-FFI): Professional manual*. Odessa, FL: Psychological Assessment Resources.
- Dalgleish, T., Tchanturia, K., Serpell, L., Hems, S., Yiend, J., de Silva, P., & Treasure, J. (in press). Self-reported

- parental abuse relates to autobiographical memory style in patients with eating disorders. *Emotion*.
- de Decker, A., Hermans, D., Raes, F., & Eelen P. (2003). Autobiographical memory specificity and trauma in inpatient adolescents. *Journal of Clinical Child and Adolescent Psychology*, 32, 22–31.
- Goddard, L., Dritschel, B., & Burton, A. (1996). Role of autobiographical memory in social problem solving and depression. *Journal of Abnormal Psychology*, 105, 609–616.
- Harvey, A. G., Bryant, R. A., & Dang, S. T. (1998). Autobiographical memory in acute stress disorder. *Journal of Consulting and Clinical Psychology*, 66, 500–506.
- Henderson, D., Hargreaves, I., Gregory, S., & Williams, J. M. G. (2002). Autobiographical memory and emotion in a non-clinical sample of women with and without a reported history of childhood sexual abuse. *British Journal of Clinical Psychology*, 41, 129–141.
- Hermans, D., & de Decker, A. (2001, December). *Adaptive aspects of overgeneral memory: Part 2*. Paper presented at the second Autobiographical Memory Workshop, Cambridge, England.
- Hermans, D., Van den Broeck, K., Belis, G., Raes, F., Pieters, G., & Eelen, P. (2002). *Trauma and autobiographical memory specificity in depressed inpatients*. Manuscript submitted for publication.
- Hoekstra, H., Ormel, H., & de Fruyt, F. (1996). *Handleiding NEO persoonlijkheidsvragenlijsten NEO-PI-R en NEO-FFI* [Manual NEO personality questionnaires NEO-PI-R and NEO-FFI]. Lisse, the Netherlands: Swets & Zeitlinger.
- Horowitz, M., Wilner, N., & Alvarez, W. (1979). Impact of Event Scale: A measure of subjective stress. *Psychosomatic Medicine*, 41, 209–218.
- Kuyken, W., & Brewin, C. R. (1995). Autobiographical memory functioning in depression and reports of early abuse. *Journal of Abnormal Psychology*, 104, 585–591.
- Lens, W., & Baeyens, H. (1991). *Dutch version of the Achievement Motives Scale*. Unpublished manuscript, University of Leuven, Belgium.
- McNally, R. J., Lasko, N. B., Macklin, M. L., & Pitman, R. K. (1995). Autobiographical memory disturbance in combat-related posttraumatic stress disorder. *Behaviour Research and Therapy*, 33, 619–630.
- McNally, R. J., Litz, B. T., Prassas, A., Shin, L. M., & Weathers, F. W. (1994). Emotional priming of autobiographical memory in post-traumatic stress disorder. *Cognition and Emotion*, 8, 351–367.
- Nygård, R., & Gjesme, T. (1973). Assessment of achievement motives: Comments and suggestions. *Scandinavian Journal of Educational Research*, 17, 319–327.
- Pennebaker, J. W., & Seagal, J. D. (1999). Forming a story: The health benefits of narrative. *Journal of Clinical Psychology*, 55, 1243–1254.
- Startup, M., Heard, H., Swales, M., Jones, B., Williams, J. M. G., & Jones, R. S. P. (2001). Autobiographical memory and parasuicide in borderline personality disorder. *British Journal of Clinical Psychology*, 40, 113–120.
- Swales, M. A., Williams, J. M. G., & Wood, P. (2001). Specificity of autobiographical memory and mood disturbance in adolescents. *Cognition and Emotion*, 15, 321–331.
- Van der Ploeg, H. M., Defares, P. B., & Spielberger, C. D. (1980). *Handleiding bij de Zelf-Beoordelings-Vragenlijst (ZBV). Een Nederlandstalige bewerking van de Spielberger State-Trait Anxiety Inventory (STAI-DY)* [Manual of the Self-Assessment Questionnaire (SAQ). A Dutch revision of the Spielberger State-Trait Anxiety Inventory (STAI-DY)]. Lisse, the Netherlands: Swets & Zeitlinger.
- Wessel, I., Meeren, M., Peeters, F., Arntz, A., & Merckelbach, H. (2001). Correlates of autobiographical memory specificity: The role of depression, anxiety and childhood trauma. *Behaviour Research and Therapy*, 39, 409–421.
- Wilhelm, S., McNally, R. J., Baer, L., & Florin, I. (1997). Autobiographical memory in obsessive-compulsive disorder. *British Journal of Clinical Psychology*, 36, 21–31.
- Williams, J. M. G. (1996). Depression and the specificity of autobiographical memory. In D. C. Rubin (Ed.), *Remembering our past. Studies in autobiographical memory* (pp. 244–267). Cambridge, England: Cambridge University Press.
- Williams, J. M. G., & Broadbent, K. (1986). Autobiographical memory in suicide attempters. *Journal of Abnormal Psychology*, 95, 144–149.
- Williams, J. M. G., Ellis, N. C., Tyers, C., Healy, H., Rose, G., & MacLeod, A. K. (1996). The specificity of autobiographical memory and imageability of the future. *Memory & Cognition*, 24, 116–125.

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