



The endorsement of dysfunctional attitudes is associated with an impaired retrieval of specific autobiographical memories in response to matching cues

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Two studies investigated a hypothesis of Dagleish et al. (2003) that overgeneral memory may arise from matching between task cues and dysfunctional attitudes or schemas. In the first study, 111 euthymic patients with at least two previous major depressive episodes completed the Dysfunctional Attitude Scale: Form A (DAS-A) and the Autobiographical Memory Test (AMT). In the second study, 82 patients with a borderline personality disorder completed the Young Schema Questionnaire (YSQ) and the same version of the AMT. In both studies, patients retrieved less specific autobiographical memories in response to cue words that matched highly endorsed attitudes or schemas. These results suggest that an impaired retrieval of specific memories may be the result of certain cues activating generic, higher-order mental representations.

Implicit in most theoretical models of autobiographical memory is the assumption of a hierarchical architecture of human memory. In Conway's model (Conway & Pleydell-Pearce,

2000), knowledge stored at the level of a lifetime period (e.g., when I was at university) or knowledge at the level of general events (e.g., attending lectures) indexes event-specific knowledge

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(e.g., the lecture of professor x on topic y). If retrieval of specific episodes is to succeed, the intermediate categoric description at the level of general events has to be inhibited so that contextual (time and place) information can be introduced in the mnemonic search. In the last two decades, numerous studies have found that this memory search process can be disrupted in individuals with depressive disorder (e.g., Brittlebank, Scott, Williams, & Ferrier, 1993), post-traumatic stress disorder (McNally, Lasko, Macklin, & Pitman, 1995), or acute stress disorder (Harvey, Bryant, & Dang, 1998). These patient groups all show an enhanced tendency to retrieve overgeneral autobiographical memories when asked to retrieve specific memories of events in response to cue words.

It has been proposed that emotional factors such as abuse or chronic adversity in childhood or adolescence can affect the ability to learn to fully control the retrieval process (Williams, 1996), with failure to retrieve specific details of autobiographical events representing a form of learned passive avoidance of distressing material. In addition to this developmental perspective, it has also been suggested that the memory search process may be aborted at the categoric stage because various factors reduce the functioning of working memory, executive functioning, or the supervisory attentional system (Wheeler, Stuss, & Tulving, 1997). Biological factors (e.g., frontal lobe dysfunction) and cognitive intrusions, as observed in acute stress disorder (Harvey et al., 1998) or depression (Brewin, Reynolds, & Tata, 1999; Kuyken & Brewin, 1995) have been implicated because of their potential to drain processing resources necessary for generating specific memories. From this alternative perspective, the memory system may be developmentally normal, but individuals are not able to retrieve specific memories because the memory system is temporarily disrupted.

It is noteworthy that in these accounts of the retrieval of overgeneral memories, relatively little attention is paid to the meaning of the specific words used in the cue-word task. Up until now, more formal attributes of the cue words have been investigated, such as their frequency or imageability (e.g., Williams, Healy, & Ellis, 1999). Further, in studies where results on memory for positive and negative cue words are reported separately, overgenerality is found sometimes for positive cues only, sometimes for negative cues only, and sometimes for both (van

Vreeswijk & de Wilde, 2004). Explanations proposed to account for these inconsistent findings with respect to cue valence such as mood congruency (e.g., Maccallum, McConkey, Bryant, & Barnier, 2000) have not been completely satisfactory.

Dalgleish et al. (2003) have recently proposed an alternative theory. They state that one of the reasons an individual may “fail” to retrieve a specific memory in response to a particular cue word has less to do with whether it is positive or negative, than whether it maps closely onto the content of coherent, more generic, higher-order mental representations—e.g., dysfunctional attitudes (Clark, Beck, & Alford, 1999) or schematic models (Power & Dalgleish, 1997). Specifically, Dalgleish et al. (2003) suggest that responses to cue words amount to a propositional “read-off” of activated mental representations. Cue words that match dysfunctional attitudes or schemas will cause these attitudes or schemas to become (more) activated. When cue words map closely onto the content of highly endorsed dysfunctional attitudes, these attitudes may become more activated and may promote task-irrelevant processing of themes related to salient concerns and well-rehearsed generic self-knowledge. Consequently, fewer processing resources will be available for memorial search, and this potentially leads to the memory search being aborted prematurely, increasing the chance that categoric-level descriptors will be accepted as a suitable response.

We tested Dalgleish’s hypothesis in two populations, both recruited for randomised controlled trials of cognitive treatment, one aimed at the prevention of relapse/recurrence of depression (Bockting et al., 2005), and the other at the long-term treatment of borderline personality disorder (Giesen-Bloo et al., 2006). The baseline assessments of these patient samples were judged to be very suitable to test our research question for the following reasons: (a) The previously depressed patients (Spinhoven et al., 2006), as well as those borderline patients who also had a comorbid depression (Kremers, Spinhoven, & Van der Does, 2004), displayed overgeneral memory; (b) It is widely assumed that in both patient groups, reactivation of dysfunctional attitudes or maladaptive schemas is associated with the onset or maintenance of these disorders (Clark et al., 1999; Lau, Segal, & Williams, 2004; Young, 1994). The primary aim of our study was to investigate whether the endorsement of dysfunctional atti-

tudes is associated with the generation of more overgeneral and less specific memories when the words of a cue-word task map closely onto the content of such attitudes. First, the results of testing this hypothesis in a sample of recurrently depressed patients will be described (Study 1), followed by a description of the results found in a sample of patients with a borderline personality disorder (Study 2).

STUDY 1

Method

Participants

To be eligible, participants had to meet the following criteria: (a) at least two Major Depressive Episodes in the last 5 years, as defined according to DSM-IV (American Psychiatric Association, 1994) and assessed by the Structured Clinical Interview for DSM-IV (SCID: First, Spitzer, Gibbon, & Williams, 1997) by trained evaluators; (b) current remission status according to DSM-IV criteria, for longer than 10 weeks, and no longer than 2 years ago; (c) a current score on the Hamilton Rating Scale for Depression (Hamilton, 1960) of <10 . Exclusion criteria were: current mania or hypomania or a history of bipolar illness, any psychotic disorder (current and previous), organic brain damage, alcohol or drug misuse, predominant anxiety disorder, recent ECT, recent cognitive treatment, receiving CT at the start of the study or current psychotherapy with a frequency of more than twice a month.

Participants were recruited at psychiatric centres and through media announcements in The Netherlands. After a complete description of the study had been given to the participants, written informed consent was obtained prior to randomisation. The protocol was approved by the institutional ethics review committees. A total of 111 participants completed the DAS-A and AMT. The mean age of the patients was 44.4 ($SD = 9.4$), and 71.4% of the sample was female. Mean education level (theoretical range 0–6) was 3.4 ($SD = 1.6$; range 0–6). The mean HRSD score was 3.6 ($SD = 2.8$; range 0–9). A total of 20% of the participants reported two previous depressive episodes in the past, 23.8% reported three previous episodes, 29.5% reported four to six previous episodes, and 26.7% reported six or more previous episodes.

Materials and measures

Axis I diagnosis. Psychiatric diagnoses on Axis I were assessed with the Structured Clinical Interview for DSM-IV (SCID-I; First et al., 1997).

Severity of depressive symptoms. The 17-item Hamilton Rating Scale for Depression (HRSD; Hamilton, 1960) was used to assess patients' levels of depressive symptomatology.

Autobiographical Memory Test (AMT). McNally et al. (1995) modified the autobiographical memory paradigm, which was used by Williams and Broadbent (1986). In their modified version, respondents are asked to mention a specific moment at which they exhibited a personal trait that is written on a card. In this study, we used this modified version of the AMT. A specific memory is defined as a memory that refers to a particular event in the past that happened on one particular day, lasting no longer than 1 day. Words were read aloud and at the same time were shown on a card. Respondents were asked to retrieve a memory as quickly as possible, and were allowed 60 seconds to remember an event. The cue words were presented after three practice words.

Answers were recorded on audiotape. The following scoring categories were used: (a) specific: when the respondent's first memory referred to a particular event on one particular day; (b) categorical: when the memory referred to repeated events; (c) extended: when the remembered event lasted longer than 1 day; and (d) no memory/omission: when the respondent did not mention a memory or did not respond. One trained research assistant blind to the research question scored all the tapes. Inter-rater agreement on 50% of the retrieved memories ($n = 555$) indicated good reliability, 88.5% agreement, $kappa = 0.79$, comparable with previous studies. The following positive (+) and negative (–) words were used: friendly (+), guilty (–), impolite (–), honest (+), helpful (+), jealous (–), intelligent (+), selfish (–), humorous (+), and hostile (–). At face value it seemed that four of the 10 AMT cues referred to a common trait associated with helpfulness. Consequently, two positive (friendly and helpful) and two negative cue words (impolite and selfish) were selected and combined into a subscale reflecting personal traits involved in helping others: Helpfulness-Relevant (HR). The other six AMT items formed the

second subscale of the AMT: Helpfulness-Irrelevant (HI).¹

Dysfunctional attitudes. Dysfunctional attitudes were assessed with the Dutch translation of the Dysfunctional Attitude Scale, Form A (DAS-A; Douma, 1991; Weissmann, 1979). Four items were selected that directly pertained to attitudes related to a specific aspect of Need for Approval: helping others: “I should be able to please everybody”; “To be a good moral worthwhile person, I must help everyone who needs it”; “It is best to give up your own interests in order to please other people”; “If someone performs a selfish act, this means he is a selfish person”. In order to compose a subscale that specifically relates to attitudes with respect to helping others and which could be activated by the matching helpfulness-relevant AMT cue words, a subscale comprising these four DAS-A items was formed and named Helpfulness-Relevant (HR). The other 36 items of the DAS-A were combined into a Helpfulness-Irrelevant (HI) subscale.

Procedure

After telephone screening on inclusion and exclusion criteria, patients were administered the SCID and HRDS by research assistants. Patients were tested with the DAS-A followed by the AMT in a fixed order before random assignment to treatment condition.

RESULTS

Preliminary analyses

In order to investigate the inter-rater reliability of categorising the 10 cue words of the AMT and the 40 items of the DAS-A as relevant or irrelevant with respect to helpfulness, 15 colleagues of the section of Clinical and Health Psychology at Leiden University, blind to the research question of the present study, independently rated these 50 items on a 6-point Likert scale ranging from 1 (“not at all relevant”) to 6

(“extremely relevant”). The four AMT items of the Helpfulness-Relevant scale obtained the four highest mean ratings. The mean rating for these four items combined ($M = 4.7$; $SD = 1.0$) was significantly higher than the mean rating for the six other AMT items combined ($M = 2.7$; $SD = 0.90$) $t(14) = 6.484$, $p < .001$. The four DAS-A items of the Helpfulness-Relevant subscale also obtained the four highest mean ratings. The mean rating for these four items combined ($M = 4.1$; $SD = 1.5$) was significantly higher than the mean rating for the 36 other AMT items combined ($M = 2.5$; $SD = 0.93$) $t(14) = 3.982$, $p < .001$. The results of these analyses indicate a good inter-rater reliability in forming a priori subscales of the AMT and DAS-A reflecting personal traits or attitudes relevant versus irrelevant in helping others.

Number of specific responses

For the 10 items of the AMT, the participants produced a mean number of 5.4 ($SD = 2.7$) specific responses. The scores ranged from 0 to 10. A t -test for dependent samples revealed no significant differences between the percentage of specific answers retrieved on the HR subscale ($M = 52.1$; $SD = 29.9$) and on the HI subscale ($M = 56.2$; $SD = 29.3$), $t(110) = 1.763$, ns .

Number of categoric responses

For the 10 items of the AMT, the participants produced a mean number of 2.0 ($SD = 1.9$) categoric responses. A total of 25% of the participants gave no categoric answer in reaction to any of the 10 AMT cues words. A t -test for dependent samples revealed no significant differences between the proportion of categoric answers retrieved on the HR subscale ($M = 20.8$; $SD = 23.5$) and on the HI subscale ($M = 19.2$; $SD = 21.6$), $t(110) = 0.773$, ns .

Number of extended responses and no memories/omissions

For the 10 items of the AMT, the participants produced a mean number of 0.4 ($SD = 0.8$) extended responses and 2.2 ($SD = 2.2$) no memories/omissions. T -tests for dependent samples revealed no significant differences between the proportion of extended answers, $t(110) = 0.187$, ns , and the proportion of no memories/omissions, $t(110) = 1.479$, ns , in reaction to the HR subscale versus HI subscale of the AMT.

¹ All remaining cue words of the AMT and also all remaining items of the DAS-A were included in a Helpfulness-Irrelevant (HI) scale, in order to counteract the risk of inadvertently maximising the difference between the Helpfulness-Relevant versus the Helpfulness-Irrelevant subscale by only selecting and including into the HI subscale those items that are clearly irrelevant with respect to helpfulness.

TABLE 1
First-order correlations of autobiographical memory, biographic, illness-related, and attitude variables

Variables	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	XII.
I. Number of specific memories (AMT)		.87***	.95***	-.61***	-.54***	-.53***	-.23*	.28**	.02	.11	.17	-.20*
II. Number of specific HR memories (AMT)			.67***	-.53***	-.63***	-.34***	-.24*	.27**	.03	.14	.11	-.28**
III. Number of specific HI memories (AMT)				-.58***	-.41***	-.58***	-.20*	.25*	.02	.07	.18	-.11
IV. Number of categoric memories (AMT)					.82***	.91***	.19*	-.15	-.03	-.04	-.06	.10
V. Number of categoric HR memories (AMT)						.51***	.22*	-.15	-.02	-.03	.08	.26**
VI. Number of categoric HI memories (AMT)							.13	-.12	-.03	-.03	-.16	-.04
VII. Age								-.11	-.08	-.13	-.10	.25**
VIII. Education									-.01	-.11	.03	-.09
IX. HDRS										.16	.23*	.04
X. History of depression											.14	-.03
XI. Total DAS-A score												.28**
XII. Δ HR-HI DAS-A												

n = 111 previously depressed patients. AMT = Autobiographical Memory Test; HDRS = Hamilton Depression Rating Scale; DAS-A = Dysfunctional Attitude Scale; Form A; Δ HR-HI DAS-A = Helpfulness relevant minus helpfulness irrelevant DAS-A scores.
* *p* < .05; ** *p* < .01; *** *p* < .001.

Scores for dysfunctional attitudes

Our sample of patients with recurrent depression manifested moderately high scores for dysfunctional attitudes, as witnessed by a mean total score of 124.2 (*SD* = 33.5; range 52–226) on the DAS-A (Dozois, Covin, & Brinker, 2003). Using a *t*-test for dependent measures, a significant difference between the mean item score on the HR subscale (*M* = 3.2; *SD* = 1.3) in comparison to the mean score on the other 36 items of the DAS-A (HI subscale) (*M* = 3.1; *SD* = 0.8) was found, *t*(110) = 2.01, *p* < .05. However, the effect size of this difference is negligible (Cohen’s *d* < .15).

Relationship of dysfunctional attitudes with specific memories

Table 1 gives an overview of the first-order correlations of the number of specific and categoric memories, biographic (age and level of education) and illness-related variables (depression severity and number of previous depressive episodes), and DAS-A scores. As can be derived from this table, the number of specific and categoric memories proved to be highly intercorrelated. Moreover, age and level of education are especially predictive of the number of specific memories.

The relationship of dysfunctional attitudes with specific memories was analysed with hierarchical multiple regression analyses. In all analyses, age, level of education—scored from 0 (primary school) to 6 (university education)—depression severity (HRDS), and number of previous depressive episodes were forced into the equation in the first step, and total DAS-A scores and the difference between scores on the HR and HI subscales of the DAS-A (Δ DAS-A scores) in the second step. In the multiple regression analyses, Δ DAS-A represents the unique effect of scoring differently with respect to helpfulness-relevant compared to helpfulness-irrelevant attitudes on autobiographical memory, independent of and above the effect of the general level of dysfunctional attitudes. In none of the analyses was evidence for multicollinearity found (all tolerance values > .826). In the first analysis, the number of specific memories on the total AMT was the criterion. Age, level of education, depression severity, and number of previous depressive episodes were forced into the equation in the first step and accounted for a significant proportion of 14% of the variance in AMT scores, *F* change (4, 106) = 4.194,

$p < .01$. Total DAS-A scores and Δ DAS-A scores forced into the equation in the second step did not improve upon the model, F change (2, 104) = 2.702, *ns*. So, after statistically correcting for differences in biographic and illness-related variables, the significant first-order correlation of the number of specific memories with Δ DAS-A scores ($r = -.20, p < .05$) was no longer statistically significant.

Next, the number of specific responses on the HR subscale of the AMT served as criterion. Age, level of education, severity of depression, and number of previous depressive episodes entered in the first step accounted for a significant proportion of 15% of the AMT HR scores, F change (4, 106) = 4.574, $p < .01$. Total DAS-A scores and Δ DAS-A scores were entered into the equation in the second step and significantly improved on the model, F change (2, 104) = 3.971, $p < .05$. In the final significant prediction model, F (6, 104) = 4.544, $p < .001$, level of education, $\beta = .237, t = 2.673, p < .01$, and Δ DAS-A scores, $\beta = -.261, t = -2.714, p < .01$, were the only significant predictor variables. These results imply that the significant first-order correlation of the number of specific HR memories with Δ DAS-A scores ($r = -.28, p < .01$) also remained significant after statistically correcting for differences in biographic and illness-related variables, and indicate that a higher endorsement of helpfulness-relevant than helpfulness-irrelevant dysfunctional attitudes predicts retrieval of fewer specific memories in response to cues referring to traits related to helpfulness, over and above the effect of the endorsement of dysfunctional attitudes on the

total DAS-A scale in general. Table 2 displays the standardised beta-coefficients, t and p values of each predictor variable, and the semi-partial correlation of each predictor with the criterion variable, as well as the amount of variance explained by each step in the final model.

Subsequently, the same analysis was repeated with retrieval of specific memories to helpfulness-irrelevant cues as the criterion variable. Total DAS-A and Δ DAS-A scores entered as predictors in the second step only accounted for 3% of additional variance in AMT HI scores, $F(2, 104) = 1.72, ns$.

Relationship of dysfunctional attitudes with categoric memories

The relationship of dysfunctional attitudes with categoric memories was analysed with similar hierarchical multiple regression analyses. In the first analysis, the number of categoric memories on the total AMT was the criterion. Age, level of education, depression severity, and number of previous depressive episodes did not account for a significant proportion of the variance in AMT scores in the first step, F change (4, 106) = 1.622, *ns*. The total DAS-A and Δ DAS-A scores forced into the equation in the second step did not improve on the model, F change (2, 104) = 0.235, *ns*.

Next, the number of categoric responses on the HR subscale of the AMT served as criterion. Age, level of education, severity of depression, and number of previous depressive episodes entered in the first step did not account for a significant proportion of the AMT HR scores, F change

TABLE 2
Hierarchical regression analyses: Specific memories on the HR subscale

Variable	<i>B</i>	<i>t</i>	<i>R</i> ²	ΔR^2 of step	Semipartial <i>R</i>
<i>Step 1</i>					
Age	-.146	-1.561	.147**	.147**	-.14
Education level	.237	2.673**			.23
HDRS	-.033	-.367			-.03
History of depression	.157	1.723			.15
<i>Step 2</i>					
Total DAS-A	.153	1.596	.208***	.061*	.14
Δ HR/HI DAS-A	-.261	-2.714**			-.24

Summary of hierarchical regression analyses with respect to number of specific memories on the Helpfulness-Relevant subscale of the AMT in the final model. $n = 111$ previously depressed patients. AMT = Autobiographical Memory Test; HDRS = Hamilton Depression Rating Scale; DAS-A = Dysfunctional Attitude Scale: Form A; Δ HR-HI DAS-A = Helpfulness relevant minus helpfulness irrelevant DAS-A scores.

* $p < .05$; ** $p < .01$; *** $p < .001$.

TABLE 3
Hierarchical regression analyses: Categorical memories on the HR subscale

Variable	B	t	R ²	Δ R ² of step	Semipartial R
<i>Step 1</i>					
Age	.169	1.707	.069	.069	.16
Education level	-.126	-1.339			-.12
HDRS	-.022	-.226			-.02
History of depression	-.071	-.733			-.07
<i>Step 2</i>					
Total DAS-A	.066	.653	.113*	.044	.06
Δ HR/HI DAS-A	.187	1.835			.17

Summary of hierarchical regression analyses with respect to number of categorical memories on the Helpfulness-Relevant subscale of the AMT in the final model. $n = 111$ previously depressed patients. AMT = Autobiographical Memory Test; HDRS = Hamilton Depression Rating Scale; DAS-A = Dysfunctional Attitude Scale: Form A; Δ HR-HI DAS-A = Helpfulness relevant minus helpfulness irrelevant DAS-A scores.

$p < .05$.

(4, 106) = 1.964, *ns*. The total DAS-A and Δ DAS-A scores were entered into the equation in the second step, and the resulting improvement of the model was borderline significant, F change (2, 104) = 2.552, $p = .08$. In the final significant prediction model, $F(6, 104) = 2.198$, $p < .05$, none of the independent variables significantly contributed to the prediction of the number of categorical memories on the HR subscale of the AMT (see Table 3). These results indicate that the significant first-order correlation of the number of HR categorical memories with Δ DAS-A scores ($r = .26$, $p < .01$) was no longer significant after statistically correcting for differences in biographic and illness-related variables.

Subsequently, the same analysis was repeated with retrieval of categorical memories to helpfulness-irrelevant cues as the criterion variable. Total DAS-A and Δ DAS-A scores entered as predictors in the second step only accounted for 2% of additional variance in AMT HI scores, $F(2, 104) = 1.082$, *ns*, and the final prediction model was not significant, $F(6, 104) = .907$, *ns*.

Discussion

This study examined the extent to which over-general memory might arise from a synchrony between long-held dysfunctional attitudes and the trait words used to cue memory in previously depressed patients. The results showed that the retrieval of less specific memories in response to cue words of the Autobiographical Memory Test (AMT) denoting personal traits involved in helping others was, as predicted, associated with a

higher endorsement of items of the Dysfunctional Attitude Scale (DAS-A) referring to dysfunctional attitudes with respect to helpfulness than of helpfulness-irrelevant items, also after statistically correcting for the influence of age, level of education, depression severity, and number of previous depressive episodes. However, the higher endorsement of dysfunctional attitudes related to helpfulness no longer resulted in a propensity to retrieve more categorical memories in response to matching cues after statistically correcting for the effect of biographical and illness-related variables. We suggest that, in patients for whom helpfulness is seen as critical in maintaining their self-esteem, the presence of cues that activate the helpfulness construct is sufficient to distract the person away from the task to retrieve a specific memory. Before speculating further, however, it is important to see if this effect applies only to the DAS-A and only to previously depressed patients. Study 2 used the opportunity provided by a parallel trial that had used the identical measure of autobiographical memory alongside another measure of long-held attitude/schema in a different group of patients, to examine Dalglish's hypothesis further.

STUDY 2

Method

Participants

To be eligible, participants had to meet the following criteria: (a) a main diagnosis of Borderline Personality Disorder (BPD) as defined

according to DSM-IV (American Psychiatric Association, 1994) and assessed by the Structured Clinical Interview for DSM-IV (SCID-II; First, Spitzer, Gibbon, & Williams, 1994) by independent trained research assistants; (b) age between 18 and 60 years; (c) a Personality Disorder Severity Index, fourth version (BPDSI-IV; Arntz et al., 2003; Giesen-Bloo, Wachters, Schouten, & Arntz, 2007) score above 20; (d) Dutch literacy. Exclusion criteria were: psychotic disorders (except short, reactive psychotic episodes); bipolar disorder; dissociative identity disorder; antisocial personality disorder; attention deficit hyperactivity disorder; addiction of such severity that clinical detoxification was indicated; psychiatric disorders secondary to medical conditions; and mental retardation.

Participants were referred by therapists in secondary and tertiary community mental health institutes in each centre's area. After a complete description of the study was given to the participants, written informed consent was obtained prior to randomisation. The protocol was approved by the medical ethical committees of the four participating centres. A total of 82 participants completed the YSQ and AMT. The mean age of the patients was 30.8 ($SD = 8.0$), and 92.7% of the sample was female. Mean education level (theoretical range 0–11) was 7.6 ($SD = 2.4$; range 0–11). The mean score on the BPDSI (theoretical range 0–90) was 33.9 ($SD = 8.1$; range 20–63). A total of 57.3% of the patients had a current depressive episode. Patients had a mean number of 2.7 ($SD = 2.1$) Axis I disorders (SCID-I) and 2.1 ($SD = 1.2$) Axis II disorders (SCID-II).

Materials and measures

Beck Depression Inventory (BDI). The BDI (Beck, Ward, Medelsohn, Mock, & Erbaugh, 1961) is a 21-item self-report questionnaire, which measures the severity of depressive symptoms during the past week.

Young Schema Questionnaire (YSQ). The YSQ is a 205-item self-report questionnaire developed to measure 16 core beliefs or early maladaptive schemas (Young, 1994; see also Lee, Taylor, & Dunn, 1999; Schmidt, Joiner, Young, & Telch, 1995). Core beliefs or early maladaptive schemas refer to stable and enduring themes that develop during childhood. The items are answered on a 6-point Likert-type scale ranging from 1 ("totally inapplicable to me") to 6 ("describes me per-

fectly"). The 16 core beliefs are grouped into five domains or higher-order factors (Lee et al., 1999):

- a. *Disconnection*, comprising: (1) Abandonment/instability; (2) Defectiveness/shame; (3) Emotional deprivation; (4) Mistrust/abuse; (5) Social isolation/alienation
- b. *Impaired autonomy*, comprising: (6) Dependence/incompetence; (7) Vulnerability to danger; (8) Enmeshment; (9) Failure
- c. *Impaired limits*, comprising: (10) Entitlement/domination; (11) Insufficient self-control/self-discipline
- d. *Other-directedness*, comprising: (12) Self-sacrifice; (13) Subjugation
- e. *Overvigilance and inhibition*, comprising: (14) Emotional inhibition; and (15) Unrelenting standards.

The sixteenth subscale for Social Undesirability failed to emerge as an independent factor (Lee et al., 1999) and was excluded from further analyses. The domain that directly pertained to attitudes related to helping others (i.e., Other-directedness) constituted the Helpfulness-Relevant (HR) subscale, while the domain that pertained to attitudes related to taking no responsibility for others, difficulty in respecting the rights of others, and problems in cooperating with others (i.e., Impaired limits), constituted the Helpfulness-Irrelevant (HI) subscale. Example items from the Helpfulness-Relevant subscale are: "I worry a lot about pleasing other people so they won't reject me" (Subjugation subscale) and "I put others' needs before my own or else I feel guilty" (Self-sacrifice subscale). Example items from the Helpfulness-Irrelevant subscale are: "I usually put my needs ahead of the needs of others" (Entitlement subscale) and "Often I allow myself to carry through on impulses and express emotions that get me into trouble or hurt other people" (Insufficient self-control/self-discipline subscale). By summation of the mean item scores for both subscales, a total score was computed for the YSQ. A higher score on a scale indicates a higher endorsement of early maladaptive schemas.

Autobiographical Memory Test (AMT). The same version of the AMT as in Study 1 was administered. One of the authors (IPK), blind for this post hoc research question, scored all the tapes. Inter-rater agreement on 20% of the

retrieved memories ($n = 360$) indicated good reliability, $\kappa = 0.89$.

Procedure

Patients' first assessment was made after inclusion and before randomisation by independent trained research assistants. Patients who met inclusion criteria and no exclusion criteria were tested with the AMT followed by the YSQ in a fixed order before random assignment to treatment condition.

Results

Preliminary analyses

In order to investigate the inter-rater reliability of categorising the five domains of the YSQ as relevant or irrelevant with respect to helpfulness, 12 colleagues of the section of Clinical and Health Psychology at Leiden University, blind to the research question of the present study, independently rated these five domains on the same 6-point Likert scale as used in Study 1. The domain Other-directedness clearly obtained the highest mean rating, and the domain Impaired limits the lowest, while the scores for the other three domains were intermediate. The mean rating for Other-directedness ($M = 5.4$; $SD = 0.51$) was significantly higher than the mean rating for Impaired limits ($M = 3.2$; $SD = 1.5$) $t(11) = 6.413$, $p < .001$. The results of these analyses indicate a satisfactory inter-rater reliability in forming a priori subscales of the YSQ reflecting personal traits or attitudes relevant versus irrelevant in helping others.

Number of specific responses

For the 10 items of the AMT, the participants produced a mean number of 6.3 ($SD = 2.0$) specific responses. All of the participants gave at least three specific answers. A t -test for dependent samples showed that the percentage of specific answers retrieved on the HR subscale ($M = 59.4$; $SD = 26.5$) was significantly lower than on the HI subscale ($M = 65.6$; $SD = 22.3$), $t(81) = 2.11$, $p < .05$. However, the effect size of this difference is small (Cohen's $d = .25$).

Number of categoric responses

For the 10 items of the AMT, the participants produced a mean number of 2.1 ($SD = 1.8$) categoric responses. A total of 28% of the

participants gave no categoric answer in reaction to any of the 10 AMT cues words. A t -test for dependent samples revealed no significant differences between the proportion of categoric answers retrieved on the HR subscale ($M = 23.8$; $SD = 25.1$) and on the HI subscale ($M = 19.7$; $SD = 18.7$), $t(81) = 1.57$, ns .

Number of extended responses and no memories/omissions

For the 10 items of the AMT, the participants produced a mean number of 0.2 ($SD = 0.5$) extended responses and 1.3 ($SD = 1.3$) no memories/omissions. T-tests for dependent samples revealed a significant difference between the proportion of extended answers retrieved on the HR subscale ($M = 1.2$; $SD = 4.4$) and the proportion retrieved on the HI subscale ($M = 7.3$; $SD = 2.6$), $t(81) = 2.529$, $p < .05$. No significant differences in the proportion of no memories/omissions in reaction to the HR subscale versus HI subscale of the AMT were observed, $t(81) = 0.399$, ns .

Scores for early maladaptive schemas

Our sample of patients with BPD manifested relatively high scores for early maladaptive schemas, as witnessed by a mean total score of 704.5 ($SD = 150.8$; range 337–995) on the YSQ (Young, 1994; see also Lee et al., 1999; Schmidt et al., 1995). Using a t -test for dependent measures, a significant difference between the mean item score on the HR subscale ($M = 3.3$; $SD = 0.7$) in comparison to the mean score on the HI subscale ($M = 3.5$; $SD = 0.8$) was found, $t(81) = 3.65$, $p < .001$. However, the effect size of this difference is small (Cohen's $d = .27$).

Relationship of early maladaptive schemas with specific memories

Table 4 gives an overview of the first-order correlations of the number of specific and categoric memories, biographic (age and level of education) and illness-related variables (severity of depression and presence of a depressive disorder), and YSQ scores. As can be derived from this table, the number of specific and categoric memories proved to be highly inter-correlated. Moreover, severity of depression and especially the presence of a comorbid depressive disorder predict the number of specific and categoric memories.

TABLE 4
First-order correlations of autobiographical memory, biographic, illness-related, and schema variables

Variables	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
I. Number of specific memories (AMT)		.80***	.88***	-.75***	-.60***	-.67***	-.06	.06	-.19	-.28*	-.11	-.20
II. Number of specific HR memories (AMT)			.42***	-.57***	-.66***	-.33***	-.13	-.00	-.34***	-.30***	-.25*	-.26*
III. Number of specific HI memories (AMT)				-.68***	-.39***	-.76***	.02	.09	-.02	-.19	.03	-.10
IV. Number of categoric memories (AMT)					.83***	.87***	.09	-.20	.16	.27*	.09	.08
V. Number of categoric HR memories (AMT)						.46***	.10	-.14	.30***	.35***	.15	.16
VI. Number of categoric HI memories (AMT)							.05	-.20	-.01	.12	.02	-.10
VII. Age								.03	-.10	-.14	-.07	-.05
VIII. Education									-.11	.08	-.09	.10
IX. BDI										.34**	.48***	.08
X. History of depression											.13	.07
XI. Total YSQ score												.23*
XII. Δ HR-HI YSQ												

n = 82 patients with borderline personality disorder. AMT = Autobiographical Memory Test; BDI = Beck Depression Inventory; YSQ = Young Schema Questionnaire (HR and HI YSQ scores combined); Δ HR-HI YSQ = Helpfulness relevant minus helpfulness irrelevant YSQ scores.
* *p* < .05; ** *p* < .01; *** *p* < .001.

The relationship of early maladaptive schemas with specific memories was analysed with hierarchical multiple regression analyses. In all analyses, age, level of education—scored from 0 (no schooling) to 11 (university education)—depression severity (BDI), and comorbid depression (SCID-I) were forced into the equation in the first step, and the sum score of the means on the HR and HI YSQ subscales (total YSQ score) and the difference between scores on the HR and HI subscales of the YSQ (Δ YSQ) in the second step. In the multiple regression analyses, Δ YSQ represents the unique effect of scoring differently with respect to helpfulness-relevant compared to helpfulness-irrelevant attitudes, independent of and above the effect of the endorsement of early maladaptive schemas. In none of the analyses was evidence for multicollinearity found (all tolerance values > .702). In the first analysis, the number of specific memories on the total AMT was the criterion. Age, level of education, depression severity (BDI), and comorbid depression (SCID-I) were forced into the equation in the first step and accounted for 10% of the variance in AMT scores, *F* change (4, 77) = 2.247, *p* = .07. A comorbid depression, β = -.267, *t* = -2.301, *p* < .05, was the only significant predictor of the number of specific memories. The total YSQ and Δ YSQ scores forced into the equation in the second step did not improve on the model, *F* change (2, 75) = 1.551, *ns*.

Next, the number of specific responses on the HR subscale of the AMT served as criterion. Age, level of education, depression severity, and comorbid depression entered in the first step accounted for a significant proportion of 19% of the variance in AMT scores, *F* change (4, 77) = 4.459, *p* < .01. Total YSQ and Δ YSQ scores were entered into the equation in the second step and resulted in a borderline significant improvement of the prediction model, *F* change (2, 75) = 2.949, *p* = .06. In the final significant prediction model, *F* (6,75) = 4.106, *p* < .01, age, comorbid depression, and Δ YSQ scores, β = -.223, *t* = -2.142, *p* < .05, were the only significant predictor variables, indicating that a higher endorsement of helpfulness-relevant than helpfulness-irrelevant dysfunctional schemas predicted retrieval of fewer specific memories in response to cues referring to these traits. These results indicate that the significant first-order correlation of the number of specific HR memories and Δ YSQ scores (*r* = -.26, *p* < .01) also remained significant after statistically correcting for differences in

biographic and illness-related variables. Table 5 displays the standardised beta-coefficients, t and p values of each predictor variable, and the semi-partial correlation of each predictor with the criterion variable, as well as the amount of variance explained by each step in the final model.

Subsequently, the same analysis was repeated with number of specific memories retrieved to helpfulness-irrelevant cues as the criterion variable. None of the steps was significant and no significant model emerged, $F(6, 75) = 0.850$, ns .

Relationship of early maladaptive schemas with categoric memories

The relationship of early maladaptive schemas with categoric memories was analysed with similar hierarchical multiple regression analyses. In the first analysis, the number of categoric memories on the total AMT was the criterion. Age, level of education, depression severity (BDI), and comorbid depression (SCID-I) were forced into the equation in the first step and accounted for 14% of the variance in AMT scores, F change (4, 77) = 3.140, $p < .05$. Level of education, $\beta = -.215$, $t = -2.008$, $p < .05$, and a comorbid depression, $\beta = .289$, $t = 2.540$, $p < .05$, were both significant predictors of the number of categoric memories. The total YSQ and Δ YSQ scores forced into the equation in the second step did not improve on the model, F change (2, 75) = 0.340, ns .

Next, the number of categoric responses on the HR subscale of the AMT served as criterion. After forced entry of age, level of education,

depression severity, and comorbid depression in the first step, total YSQ and Δ YSQ scores were entered into the equation in the second step and did not significantly improve on the model, F change (2, 75) = 1.067, ns (see Table 6). Repeating the same analysis with the number of categoric memories retrieved to helpfulness-irrelevant cues as the criterion variable, the total YSQ and Δ YSQ scores also did not improve on the model, F change (2, 75) = 0.017, ns .

Discussion

In the second study, we examined whether there was evidence for a matching of cue words to schema in patients with a borderline personality disorder. The results yielded additional evidence for Dagleish's hypothesis, with a synchrony between the retrieval of specific memories to helpfulness-related cues and a relatively higher endorsement of schemas concerned with other-directedness than helpfulness-irrelevant schemas observed. This relation remained significant after correcting for the effects of age, education level, depression severity, and comorbid depression. However, no evidence was found for a synchrony between the retrieval of categoric memories to helpfulness-related cues and the endorsement of corresponding schemas. Also of note is that comorbid depression was and remained a strong and significant predictor of both indices of memory specificity in the final prediction models.

TABLE 5
Summary: Specific memories

Variable	B	t	R^2	ΔR^2 of step	Semipartial R
<i>Step 1</i>					
Age	-.204	-2.010*	.188**	.188**	-.20
Education level	.012	.115			.01
BDI	-.227	-1.902			-.19
Comorbid depression	-.228	-2.110*			-.21
<i>Step 2</i>					
Total YSQ	-.072	-.621	.247**	.059 [†]	-.06
Δ HR/HI YSQ	-.223	-2.142*			-.22

Summary of hierarchical regression analyses with respect to number of specific memories on the Helpfulness-Relevant subscale of the AMT in the final model. $n = 82$ patients with borderline personality disorder. AMT = Autobiographical Memory Test; BDI = Beck Depression Inventory; Total YSQ = Young Schema Questionnaire (HR and HI YSQ scores combined); Δ HR-HI YSQ = Helpfulness relevant minus helpfulness irrelevant YSQ scores.

[†] $p < .10$; * $p < .05$; ** $p < .01$.

TABLE 6
Summary: Categorical memories

<i>Variable</i>	<i>B</i>	<i>t</i>	<i>R</i> ²	<i>Δ R</i> ² of step	<i>Semipartial R</i>
<i>Step 1</i>					
Age	.180	1.757	.208**	.208**	.17
Education level	-.161	-1.552			-.16
BDI	.182	1.507			.15
Comorbid depression	.322	2.951**			.30
<i>Step 2</i>					
Total YSQ	-.015	-.128	.230**	.022	-.01
Δ HR/HI YSQ	.152	1.446			.15

Summary of hierarchical regression analyses with respect to number of categorical memories on the Helpfulness-Relevant subscale of the AMT in the final model. *n* = 82 patients with borderline personality disorder. AMT = Autobiographical Memory Test; BPDSI-IV = Borderline Personality Disorder Severity Index, Version IV; Total YSQ = Young Schema Questionnaire (HR and HI YSQ scores combined); Δ HR-HI YSQ = Helpfulness relevant minus helpfulness irrelevant YSQ scores.

** *p* < .01.

GENERAL DISCUSSION

The present study investigated whether the matching of memory cue words with highly endorsed schemas plays a role in contributing to the retrieval of less specific and more categorical autobiographical memories. The data from both studies provide preliminary evidence supporting the hypothesis that the activation of basic dysfunctional attitudes may result in impaired retrieval, with both previously depressed patients and patients with borderline personality disorder (BPD) responding with less specific memories to dysfunctional attitude-related cue words. The fact that these results were found in two groups of patients using two different assessments of attitudes, and after statistically correcting for differences in biographical and illness-related variables, may be considered to strengthen the evidence, although the fact that the pattern was not found with respect to the retrieval of categorical memories remains a puzzling feature of the results.

Studies that assessed autobiographical memory performance in remitted patients in comparison to depressed (Nandrino, Pezard, Poste, Reveillère, & Beaune, 2002; Park, Goodyer, & Teasdale, 2002) or normal controls (Mackinger, Pachinger, Leibetseder, & Fartacek, 2000; Park et al., 2002) suggest that autobiographical memory impairment persists after recovery and is also characteristic of remitted patients. In a previous study, in the present sample of recurrently depressed patients, we also found evidence for a tendency for overgenerality of memory compared to normal controls, with memory impairment being related to age and education level but not to the

number of previous depressive episodes (Spinhoven et al., 2006). It is therefore of note that in the present study, after controlling for age, education level, history of depression, and depression severity, the significant association of autobiographical memory impairment in response to matching cues remained.

Jones et al. (1999) compared autobiographical memory specificity of outpatients with a borderline personality disorder to that of normal controls and observed that BPD patients manifested more overgeneral memories. However, subsequent studies (Arntz, Meeren, & Wessel, 2002; Renneberg, Theobald, Nobs, & Weisbrod, 2005) did not find evidence for a lack of memory specificity in BPD. In a previous study, in the present sample of patients with borderline personality disorder, we found evidence for a tendency to retrieve less specific memories only in borderline patients with a comorbid depression (Kremers et al., 2004). Interestingly, the retrieval of less specific memories in response to matching cues in the present study was still observed after accounting for the significant effect of a comorbid depression on memory specificity.

Taken together, these results strongly suggest that the disruption to memory produced by matching of cue to schema cannot be easily explained by some specific property of the measure used to assess dysfunctional attitudes (since the same results were observed for the DAS-A and the Young Schema Questionnaire), by differences in demographic characteristics such as age or education level, or by the presence of depression or depression severity. Memory impairment might be associated with overarching factors

common to various forms of psychopathology (e.g., severity of illness, motivational deficits, effortful processing deficits; Dalgleish & Watts, 1990). In particular, depressive disorders and post-traumatic stress disorders are associated with deficits in executive functioning and autobiographical memory impairments. Executive functioning refers to cognitive processes that control and integrate other cognitive activities such as semantic and autobiographical memory. As has already been noted by Williams (1996), executive dysfunction may be one of the pathways leading to overgeneral memory retrieval. Prospective studies experimentally manipulating executive control and schema activation while using a theory-driven and more extensive set of memory cue words would provide a more stringent test to study whether activation of dysfunctional schemas indeed constitutes one of the factors influencing executive control and memory retrieval.

A number of factors could be responsible for the disruption of the autobiographical memory system we observed. We suggest that the selected cue words of the AMT captured the attention of individuals who endorsed attitudes pertaining to these cue words. As has recently been proposed (Conway & Kane, 2001) individuals differ in the extent to which their attention is captured. Individuals with greater working memory capacity exhibit greater attentional control than individuals with lesser working memory capacity. Susceptibility to attentional capture depends on the ability to maintain goal-relevant information, especially in contexts providing sources of competition or interference with that goal. When cue words map closely onto the content of highly endorsed dysfunctional attitudes, these attitudes may become more activated, with processing pressure as a result. This impairment in executive functioning may distract the person away from the task of the AMT to the detriment of his/her ability to retrieve specific memories.

Dalgleish et al. (2003) proposed that following schema activation, fewer processing resources will be available for memorial search, and that this potentially leads to the memory search being aborted prematurely, increasing the chance that categoric-level descriptors will be accepted as a suitable response. This account is in agreement with the results of a recent experimental study, which suggest that the existence of less elaborate and differentiated schematic models including affective dimensions contributes to the retrieval of more categoric memories in contrast to more

differentiated schematic models (Ramponi, Barnard, & Nimmo-Smith, 2004). However, because in the present study the primary effect of matching cue to schema on autobiographical memory seems to be to reduce the number of specific memories, rather than to specifically increase the number of categoric memories, this reduced capacity to retrieve specific memories could also result from other mechanisms.

A complementary explanation is that certain cue words disrupt controlled processing by promoting rumination. This more process-based hypothesis is consistent with the original idea of Williams and Dritschel (1988) that it is the ruminative aspect of depression rather than mood per se that contributes to the proneness to retrieve categoric memories. The results of some recent experimental studies are in support of this idea that more ruminative, verbal-analytical, and self-focused cognitive processes may result in the retrieval of less specific memories (Ramponi et al., 2004; Watkins & Teasdale, 2001; Watkins, Teasdale, & Williams, 2000).

A further alternative explanation of these results is that, for any such long-held attitudes, there are more actual instances of relevant situations in the past, and so these events are more likely to have been encoded in generic form. Although an encoding explanation remains possible, the fact that overgenerality in memory can be manipulated experimentally (e.g., Watkins & Teasdale, 2004) suggests a retrieval explanation. Nevertheless, future research might examine this possibility directly by using independent judges (e.g., a family member) to assess the frequency of certain types of event.

Given this uncertainty about which factors are responsible for the disruption of the autobiographical memory search, further studies that match cue words with schematic models are needed and may help to throw light on the cognitive processes involved in the generation of overgeneral autobiographical memories. Because the present study was an opportunistic post-hoc study to test Dalgleish's hypothesis in the context of recruiting and assessing patients for two randomised controlled trials, it suffers from all the limitations inherent in such a post-hoc analysis, notably the risk of obtaining spurious results. Of note is that post hoc only a small set of cue words on the AMT could be identified referring to a special schema (i.e., helpfulness). Because of this post-hoc classification, cue words may also have differed beyond the helpfulness dimension, e.g.,

in frequency, imageability, or emotionality. However, it seems rather unlikely that these possible differences in cue words critically affected our study results, because in three of the four comparisons there were no significant differences in the retrieval of specific or categoric memories to helpfulness-relevant and helpfulness-irrelevant cues, and the effect size of the only difference found (i.e., somewhat more specific memories to helpfulness irrelevant cues in previously depressed participants) was small. In future prospective studies, a larger set of theory-driven cue words should be chosen relevant for a special group of patients, such as cue words referring to perfectionism in depression (Clark et al., 1999) or abandonment in patients with borderline personality disorder (Young, 1994; see Crane, Barnhofer, & Williams, 2007 this issue). On the other hand, a strength of the present opportunistic study may be that there were no specific demand characteristics inducing bias in the assessment of autobiographical memories and the endorsement of dysfunctional attitudes or maladaptive schemas. Moreover, classifying the cue words of the AMT, the items of the DAS-A, and the domains of the YSQ with respect to helpfulness proved to be reproducible with a satisfactory inter-rater reliability. Also, the hypothesised association of memory retrieval with schema endorsement was found in two different patient samples and with different measures for the endorsement of higher-order schematic representations. In conclusion, we suggest that it may be worthwhile to study schema activation as one of the factors contributing to the generation of overgeneral autobiographical memories in prospective and controlled studies in various groups of subjects.

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