Cognitive Therapy and Research, Vol. 24, No. 3, 2000, pp. 279–295

Dissociative Style and Directed Forgetting

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Dissociative style may correspond to an enhanced ability to avoid conscious recollection of traumatic experiences, which may, however, remain dormant in nonconscious memory. This hypothesis was tested in two ''directed-forgetting'' experiments with affectively neutral words (experiment 1) and sex and threat words (experiment 2) employing students high and low in dissociative style, and dissociative patients. Conscious and nonconscious memory were separated with the process dissociation procedure (Jacoby, 1991). Instruction to forget was expected to reduce conscious but to enhance nonconscious memory performance in subjects with a high dissociative ability. Results were opposite to predictions. Particularly for sex words, the instruction to forget raised the overall (conscious and nonconscious) memory performance of the patients. An alternative construction hypothesis is proposed that identifies dissociative style with enhanced skills of constructing conscious experiences.

KEY WORDS: dissociation; memory; directed forgetting.

Dissociative Identity Disorder (DID), formerly known as Multiple Personality Disorder, has captured the imagination of psychiatrists, psychologists, writers, and the general public alike. Particularly in recent years there has been an enormous increase in the number of patients diagnosed with this disorder. According to the DSM-IV (APA, 1994), DID is characterized by the presence of two or more distinct identities or personality states (''alters'') that may recurrently take control of behavior. Particular identities may emerge in specific circumstances, usually triggered by psychosocial stress, and may differ in reported age and gender, vocabulary, general knowledge, or predominant affect. The hallmark of the dissociative disorders is psychogenic amnesia (Kihlstrom, Tataryn, & Hoyt, 1993), which involves gaps in memory for personal history, both remote and recent. There may be not only loss

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0147-5916/00/0600-0279$18.00/0

of memory for recurrent periods of time, but also an overall loss of autobiographical memory for some extended time in childhood. Individuals with DID also frequently report having experienced severe physical and sexual abuse, especially during childhood (Bliss, 1986; Kluft, 1986; Putnam, Guroff, Silberman, Barban, & Post, 1986). Controversy surrounds the accuracy of such reports because childhood memories may be particularly subject to distortion (Ceci & Bruck, 1993; Loftus, 1993), and individuals with this disorder seem to be highly hypnotizable and particularly sensitive to suggestive influences (Bliss, 1986; Van Dyck, 1990).

The distinction between conscious (explicit, direct) and nonconscious (implicit, indirect) memory processes (Richardson-Klavehn & Bjork, 1988; Roediger, 1990; Schacter, 1987) may be particularly useful for the investigation of the disorder because the amnesia of DID patients might affect conscious recollection, but not nonconscious memory processes. Thus, patients with a dissociative disorder may have an increased ability to selectively forget or discard information on a conscious level if they are motivated to do so in order to avoid negative emotions associated with this information. This suggestion is known as the cognitive avoidance hypothesis (Cloitre, 1992). Possibly, the effort to discard emotionally laden material can succeed for conscious memory, but might result in a better imprinting of the material in nonconscious memory (Kihlstrom et al. 1993). This could lead to several negative emotional consequences, such as disruptions in the usually integrated functions of consciousness, memory, identity, or perception of the environment (i.e., dissociations).

Implicit (nonconscious) memory performance is defined by a change in behavior that is attributable to some prior episode of experience when no explicit reference is made at test to this episode (Schacter, 1987). Typically, implicit memory is revealed by tasks that do not require conscious or intentional recollection of those experiences. An example of an implicit memory task is word stem completion. Subjects are presented a word stem and are asked to complete it to the first word that comes to mind. Previously presented words will generally be completed more often than new words. Although subjects may not be able to retrieve the previously presented words consciously, they nevertheless show an (automatic) effect of memory. Explicit memory performance, on the other hand, involves conscious retrieval of information. In explicit memory tasks, subjects are explicity instructed to retrieve previously presented words, as in the cued recall task, in which subjects are asked to complete word stems only to previously presented words.

The difference between explicit and implicit tests of memory can be rather subtle and may merely depend on the instruction given to the participants. Jacoby, Toth, and Yonelinas (1993) argued that usual tests of explicit (e.g., free recall, primed recall, or cued recall) and implicit memory (e.g., word stem completion or fragment completion) are not the best ways to distinguish between these types of memory performance. Implicit measures of memory, particularly when they follow intentional learning, may be contaminated by conscious recollection because it is difficult to control test awareness of the subject (see also McKone & Slee, 1997). Performance on explicit tests, on the other hand, can yield an overestimation of conscious recollection because nonconscious memory performance may contribute to it.

Jacoby (1991) has suggested a method to separate conscious and nonconscious influences on memory more strictly. His process dissociation procedure (PDP)

consists of two conditions: in one condition the two memory processes work in the same direction; in the other, conscious influences oppose the nonconscious ones. When subjects are told to complete word stems as much as possible to words previously seen and otherwise to the first word that comes to mind, recollection (R) and automatic memory (A) jointly determine performance. This is called the inclusion condition. In the exclusion condition, subjects are told to complete word stems only to new words. In this case conscious recollection prevents completion of old words. Conscious memory performance is estimated by subtracting slips of the tongue in the exclusion condition from the proportion of correctly produced words in the inclusion condition (Jacoby et al. 1993):

$$\text{Recollection} = \text{inclusion} - \text{exclusion}$$

Nonconscious (automatic) memory performance is estimated as

$$\text{Automatic} = \text{exclusion} / (1 - \text{recollection})$$

One of the tasks that has been reported to show a differential effect on conscious and nonconscious memory performance is directed forgetting. In this task, subjects are explicitly instructed to either remember or forget words. Previous research has suggested that instructions to forget lead to decreases in conscious recollection, but do not affect implicit memory performance (Bjork, 1972; Epstein, 1972; MacLeod, 1989; Paller, 1990). Two theories have been proposed to explain these findings: encoding bias in favor of to-be-remembered words (MacLeod, 1989) and retrieval inhibition of to-be-forgotten material (Bjork, 1989). Retrieval inhibition may, however, not reflect underlying differences in conscious and nonconscious memory processes, but may form a type of response bias induced by differences in explicit and implicit memory testing. However, because the PDP method is designed to eliminate such differences, the recollection and automatic memory performance are considered to be pure estimates of the two types of memory storage.

Cloitre, Cancienne, Brodsky, Dulit, and Perry (1996) suggested that the directed forgetting paradigm might be a critical test for the cognitive avoidance hypothesis. If patients with a dissociative disorder are indeed more skilled in avoiding information on a conscious level and fail to do so on a nonconscious level, one would expect a more pronounced task effect of directed forgetting in conscious memory performance for this group than for subjects low in dissociative ability. Cloitre et al. (1996) performed a directed forgetting experiment on borderline patients with and without a history of childhood sexual or physical abuse and on healthy controls. As expected, the abused group showed an enhanced directed forgetting effect compared to the two control groups in explicit memory performance and not in implicit memory, suggesting that the efforts to remember/forget succeed on a conscious, but not on a nonconscious level. However, on a closer inspection of the results, the abused group showed an increased memory performance for words that had to be remembered, rather than an enhanced forgetting of to-be-forgotten words. Moreover, explicit memory performance of to-be-remembered words appeared to increase with dissociative style. Therefore, their findings seem at best inconclusive with respect to the cognitive avoidance hypothesis.

Our first experiment was aimed at gathering further information on the effects

of directed forgetting on conscious and nonconscious memory performance and its relation to dissociative ability in a nonclinical sample. The method of instructing the subjects to remember or forget was kept similar to those used by MacLeod (1989) and Cloitre et al. (1996). The novel method of opposition by Jacoby et al. (1993) was used to obtain uncontaminated estimates of the two types of memory performance. According to the cognitive avoidance hypothesis, directed forgetting in conscious memory performance should be more pronounced in high dissociative subjects than in low dissociative subjects, whereas nonconscious memory performance should not be affected by directed forgetting or might even reverse.

EXPERIMENT 1

Method

Subjects

Thirty-seven first-year psychology students (mean age 22 ± 6.2 years; 14 male, 23 female) from the University of Amsterdam participated in the experiment for course credit. Eight months prior to the study, 380 students had completed the Dissociation Questionnaire (Dis-Q; Vanderlinden, Van Dyck, Vandereycken, Vertommen, & Verkes, 1993). The Dis-Q is a 63-item self-report measure of dissociative experiences with four subscales: identity confusion, loss of control, amnesia, and absorption. The Dis-Q has a good internal consistency (Cronbach's alpha is .96 for the total scale). The test–retest reliability is .94 for the total score over 3–4 weeks. Of 60 subjects who were invited to participate in the experiment on the basis of their extreme Dis-Q scores, 37 subjects accepted the invitation. The Dis-Q was administered again during the experiment. The sample was split into two groups: subjects with a score below the median split (1.5) on the Dis-Q ($N = 18$) and subjects scoring 1.5 or beyond ($N = 17$). The high and low dissociative groups were about equally matched for age and gender. Subjects were tested in four groups of 9 or 10 subjects each. After exclusion of 2 subjects due to failure to follow instructions, 35 subjects remained for the analysis.

Material

A total of 128 affectively neutral Dutch words served as stimulus words. All words had unique word stems of two or three letters. The words had been selected from the completion norms of Phaf and Wolters (1991) and all had a completion base rate around 20% (one of five subjects would complete the word stem to the target word if it had not been studied before). A further 6 words served as buffers before and after the presentation of the critical set. The 128 words were divided randomly into four sublists, which were rotated over the remember/forget instructions and the target/distractor condition. The instructions to either remember or forget was mixed randomly by the computer. Words were presented in the center of a computer screen in capital, 18-point letters for 3 sec, followed by a 0.5-sec interval and a 2-sec presentation of the cue. The cue was either "RRRR", instructing

the subject to remember the previous word, or ''FFFF'', instructing the subject to forget. After the cue the screen was blank for 1.5 sec and then the next word appeared. Word stems of all 128 words were presented at test.

Procedure

In the first phase of the experiment, subjects were presented 70 words (3 buffer words, 64 critical words, and again 3 buffer words) with the instruction to either remember or forget words. Subjects were told that forgetting some words would improve their ability to remember other words, when their memory ''for this long and difficult list'' would be tested later. Before presentation of the 70 words, subjects were shown two cycles of a word, each time followed by a remember cue, as a demonstration of the procedure.

In the test phase, subjects were presented word stems on paper. The subjects were instructed on how to complete the word stems. Three possible completions of an example word stem were given. Half the subjects first completed a list of word stems with instructions to complete, if possible, to previously seen words and otherwise to complete to the first word that came to mind (inclusion). Subsequently, another stem list was presented with the instruction to complete only to new words (exclusion). For the other half of the subjects the order of administration of the inclusion and exclusion instructions was reversed. Both word stem lists contained 64 stems: 32 target stems could be completed to previously seen words, and 32 were distractor items, which could be completed to distractor words that were not presented. Half of the target stems corresponded to to-be-remembered words, whereas the other half corresponded to to-be-forgotten words. Finally, there were two versions of both word stem lists, differing in the order of presentation of stems.

Results

The proportion of word stems completed to to-be-remembered (TBR) words, to to-be-forgotten (TBF) words, and the proportion of distractor stems completed to critical words, in both the inclusion and exclusion conditions were calculated. The proportion of noncompleted word stems was generally very low ($P < .002$) and revealed no meaningful patterns across conditions. Both raw scores and recollection and automatic scores (Table I) were analyzed in a $2 \times 2 \times 2$ (group $\times$ instruc-

Table I. Proportions of Correctly Completed Word Stems (*SD*) for High and Low Dissociative Subjects of To-Be-Remembered (TBR) and To-Be-Forgotten (TBF) Words in the Inclusion and Exclusion Conditions, as Well as Conscious and Nonconscious Memory Performace in Experiment 1

		Test performance		Estimates of memory effects	
Instruction		Inclusion	Exclusion	Conscious	Nonconscious
Low	TBR	.47 (.16)	.07 (.08)	.39 (.21)	.10 (.09)
Dis-Q	TBF	.34 (.12)	.12 (.11)	.22 (.17)	.14 (.12)
High	TBR	.39 (.17)	.06 (.07)	.33 (.19)	.07 (.09)
Dis-Q	TBF	.36 (.09)	.09 (.11)	.27 (.11)	.12 (.13)
Base rate		.16 (.07)	.15 (.08)		

tion × type of memory) ANOVA. As might have been expected, more stems were completed with critical words in the inclusion condition than in the exclusion condition (inclusion: .39 ± .14; exclusion: .09 ± .10; $F(1, 33) = 173.95$, $p < .001$). There were no further main effects. A differential effect of directed forgetting became apparent in the inclusion and exclusion performances, $F(1, 33) = 9.70$, $p < .01$. Overall, more TBR than TBF words were completed in the inclusion condition. (TBR-incl.: .43 ± .17; TBF-incl.: .35 ± .11), whereas more TBF than TBR words were completed in the exclusion condition (TBR-excl.: .06 ± .08; TBF-excl.: .11 ± .11). There was, however, no reliable difference in directed forgetting between both groups of subjects, $F(1, 33) = 2.27$, ns. In absolute terms, the directed forgetting effect in inclusion performance was smaller for the high dissociative group (TBR: .39 ± .17; TBF: .36 ± .09) than for the low dissociative group (TBR: .47 ± .16; TBF: .34 ± .12). Exclusion performance appeared to be at floor (high dissociative, TBR: .06 ± .07, TBF: .09 ± .11; low dissociative, TBR: .07 ± .08, TBF: .12 ± .11). No other interactions were found.

Analysis of the conscious and nonconscious memory performances obtained according to the PDP showed largely similar effects. Besides the main effect of type of memory performance (conscious: .30 ± .17; nonconscious: .11 ± .11); $F(1, 33) = 31.63$, $p < .001$), a main effect of instruction was found, $F(1, 33) = 4.61$, $p < .05$. TBR words were more often recalled than TBF words (TBR: .23 ± .15; TBF: .19 ± .13). In line with the inclusion/exclusion results, directed forgetting affected conscious and nonconscious memory performance differentially, $F(1, 33) = 10.90$, $p < .01$. The recollection of TBR words (.36 ± .20) was higher than of TBF words (.25 ± .14), whereas the instruction had an opposite effect on nonconscious memory performance (TBR: .09 ± .09; TBF: .13 ± .13). No further interactions were found.

It should be noted, however, that overall nonconscious memory performance (.11) was below the baseline completion rate derived from the distractor stems (.15). This property of the opposition procedure occurs when subjects are good at excluding (consciously recollecting) words. It is, therefore, difficult to draw conclusions from nonconscious memory performance obtained with this procedure, but conscious memory performance was not affected by this flaw. In a correlational analysis, no significant association occurred between Dis-Q score and directed forgetting effect (the difference between recollection of TBR and of TBF words) ($r = -.26$, ns). In fact, the negative correlation reveals that, although not reliable, these results are opposite to expectations about dissociative style resulting from the cognitive avoidance hypothesis.

The suggestion of a decrease in directed forgetting with high dissociative ability was further supported when only extreme scorers on the Dis-Q were considered. A subset of 7 subjects was selected who scored within the clinical range on the Dis-Q and had a score on the DIS-Q total scale within the highest decile (Dis-Q total score ≥ 1.70) of the frequency distribution of the general (Dutch) population (Vanderlinden et al., 1993). A contrasting group of subjects was selected that had scored in the lowest decile of the frequency distribution of the Dis-Q (Dis-Q total score ≤ 1.35, $N = 8$). Directed forgetting disappeared for the extremely high-dissociative subjects (inclusion TBR: .36, TBF: .36) but was still apparent for the extreme low-scorers (TBR: .51, TBF: .39).

Discussion

An overall directed forgetting effect, showing forgetting in conscious but not in nonconscious memory performance, was found in Experiment 1. This successfully replicates previous findings of a differential effect of directed forgetting on both types of memory (e.g., Paller, 1990). Apparently, the directed forgetting effect can also be obtained with the new method of opposition (Jacoby et al., 1993). The PDP method, therefore, seems a promising method for investigating the relation between dissociative style and directed forgetting. Although no definitive conclusions can be drawn from the present experiment in this respect, the cognitive avoidance hypothesis does not seem to be supported. In fact, it seems contradicted by the results. Contrary to the results of Cloitre et al. (1996), the increase of recollection with dissociative style appears to have shifted from TBR words to TBF words. The difference in findings may be due to characteristics of the sample in our experiment (i.e., the absence of dissociative patients). Alternatively, dissociative style may actually be associated with a reduced ability to forget.

A number of improvements were made in the next experiment. High and low dissociative subjects in Experiment 1 may not have been sufficiently different to reveal reliable group effects. Differences in directed forgetting between groups increased when only subjects with extreme scores were selected, but then the number of subjects was too small to allow for statistical analysis. Therefore, a group of patients with a dissociative disorder was included in Experiment 2 to broaden the range of dissociative ability and improve ecological validity of the findings.

To evoke dissociative behavior presumably both trait and state factors need to make a contribution to performance. In Experiment 1, no explicit manipulation of dissociative state was included. Because it was assumed that childhood sexual trauma may be related to dissociative ability, words with a (mildly) sexual connotation were also presented and tested in Experiment 2 to induce dissociative behavior. It is sometimes argued that dissociation is not specific to sexual experiences, but that it is linked with a tendency to report negative experiences in general and that it is highly related to neuroticism (Johnson, Edman, & Danko, 1995) and to trait anxiety (Vanderlinden et al., 1993). To test for specificity of dissociation, threat words were also included in Experiment 2. Trait anxiety of the subjects was assessed with the STAI (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). The Social Desirability Scale (Crowne & Marlowe, 1964) was administered in Experiment 2 to check that groups high and low in dissociation did not differ in a tendency to comply with the instructions.

In Experiment 1, nonconscious memory performance was actually below baseline. When subjects are very successful at excluding target words, they might exclude target words that normally would be produced by chance only. Particularly when recollection is high, the oppositional nature of the task makes it difficult to compare nonconscious performance to baseline performance. Due to the apparent absence of automatic memory performance, the effect of directed forgetting and cognitive avoidance on nonconscious memory performance is not clear. To reduce conscious memory, we inserted a filler task between presentation and test in Experiment 2 so that the number of words ''leaking through'' in

the exclusion condition would be increased. In other respects, Experiment 2 was similar to Experiment 1.

EXPERIMENT 2

Directed forgetting for neutral, sex, and threat words in both conscious and nonconscious memory performance was again assessed as a function of dissociative ability. Three groups of subjects were distinguished: a low dissociative student group, a high dissociative student group, and a group of patients with a dissociative disorder. A lexical decision task (which had no word stems in common with the words in the directed forgetting task) served as filler task.

Method

Subjects

Forty-six first-year psychology students (mean age 20.81 ± 2.61 years; 9 male, 37 female) participated in the experiment for course credit. Three subjects were excluded because of failure to follow instructions, leaving 43 subjects for the analysis of the directed forgetting task. Fourteen patients (mean age 39.6 ± 9.7 years; 1 male, 13 female) with a dissociative disorder consented to participate in the experiment. They were recruited through their therapists. Diagnoses were based on the Dutch version of the SCID-D (Boon & Draijer, 1991; Steinberg, Rounsaville, & Cichetti, 1990). None of the patients showed a change of ''alter'' during the experiment.

All subjects completed the Dis-Q during the experiment. Subjects were considered as high in dissociation if they scored within the highest decile of the frequency distribution of the normal population (Dis-Q total score ≥ 1.70; Vanderlinden et al., 1993). Subjects below that level were assigned to the low dissociation group. On the basis of this selection, the high dissociative student group consisted of 20 subjects (3 male and 17 female), the low dissociative student group of 23 subjects (4 male and 19 female). Subjects also completed Dutch versions of the STAI (Spielberger et al., 1983) and the Marlowe–Crowne Social Desirability Scale (SDS; Crowne & Marlowe, 1964). For 6 patients, SDS scores were not obtained. All subjects were tested individually.

Material

Sixty-four Dutch words and 6 buffer words served as stimulus words. Again, all words had unique word stems of two or three letters (see Phaf & Wolters, 1991) and had a completion base rate around 20%. The frequencies of the words in normal language were matched and infrequent words were avoided. The mean length of the words was 6.6 (± 1.43) letters. Half of the words were neutral words, the other half were emotionally charged words; 16 words had a sexual connotation (e.g., petting, orgy, pregnant) and 16 words were related to anxiety (e.g., danger, trembling, nauseous). The words were derived empirically from a perceptual clarifi-

cation task in which these words were categorized most consistently and fastest as sex or threat words (Ter Laak, 1992). This selection provided relatively high frequency words within each emotion category.

The words were divided into two lists, each containing 16 neutral words, 8 sex words, and 8 threat words. The instruction to remember or to forget was counterbalanced for the two list halves. Two different presentation orders of the lists were used in the experiment, which was counterbalanced over subjects. Presentation of the words and instructions to remember or forget were similar to Experiment 1. For word completion, two lists of 64 words stems of two or three letters were presented on paper. The order of the inclusion and exclusion instructions was counterbalanced over the lists. From each list, 32 word stems could be completed with previously seen words, while the remaining 32 word stems were distractor stems. Of the critical word stems, half corresponded to neutral words; sex and threat words constituted the other half.

Procedure

Subjects were told that the experiment was a ''memory'' study, and were not informed about the research aims regarding dissociation. Verbal instructions were similar to Experiment 1. Subjects were then presented 70 words (64 target words and 6 buffer words) with the instruction to either remember or forget the word. After presentation of the words the filler task (lexical decision) followed, which lasted about 20 min. All subjects subsequently performed word completion with the inclusion and exclusion instructions.

Results

Self-Report Measures

As might be expected, the three groups differed significantly in their ratings of dissociative experiences (Dis-Q patients: 3.19 $\pm$ 0.64; high dissociative student group: 2.18 $\pm$ 0.35; low dissociative student group: 1.45 $\pm$ 0.14; $p < .001$). This applied to the Dis-Q subscales of identity confusion, loss of control, amnesia, and absorption as well (all $p < .001$). The patients were also more anxious than the high dissociative and the low dissociative groups before the experiment (state anxiety patients: 56.0 $\pm$ 10.2; high dissociative student group: 37.4 $\pm$ 7.0; low dissociative student group: 33.0 $\pm$ 6.0; $p < .001$), and in general (trait anxiety patients: 62.4 $\pm$ 7.6; high dissociative student group: 43.2 $\pm$ 7.6; low dissociative student group: 35.2 $\pm$ 4.8; $p < .001$). Self-reported dissociative style and anxiety were somewhat correlated (for the patient group r Dis-Q-Trait anxiety = .58; r Dis-Q-State anxiety = .39; for the student group r Dis-Q-Trait anxiety = .66, and r Dis-Q-State anxiety = .31). The high dissociative student group reported to engage significantly less in socially desirable behavior than the low dissociative group. Low dissociative students and high dissociative patients did not appear to differ on this score. There was no relation between dissociative style and socially desirable behavior.

Directed Forgetting

For the analysis of the directed forgetting task the proportion word stems completed with neutral words, sex words, and threat words for both to-be-remembered words and to-be-forgotten words were determined. Again, no meaningful patterns emerged from the proportions of noncompleted word stems ($p < .002$). Mean scores for the three groups are presented in Table II.

The inclusion and exclusion scores were analyzed in a $3 \times 2 \times 2 \times 3$ ANOVA (group $\times$ instruction $\times$ test type $\times$ word type). As could be expected, overall inclusion performance (inclusion: .25 ± .21) was much higher than exclusion performance (exclusion: .07 ± .13), $F(1, 54) = 127.7$, $p < .0001$. Somewhat surprisingly, patients (.18 ± .20) and high dissociative students (.18 ± .21) overall completed more target words than low dissociative students (.14 ± .18), $F(2, 54) = 3.44$, $p < .05$. The main effect, $F(2, 54) = 57.7$, $p < .0001$, of word type was qualified by a test type by word type interaction, $F(2, 108) = 18.8$, $p < .0001$. Inclusion performance for neutral (.32 ± .17) and sex words (.30 ± .23) was higher than for threat words (.13 ± .17), whereas only exclusion performance for neutral words (.15 ± .15) was higher than for sex (.04 ± .10) and for threat words (.03 ± .10). No other main effects were found.

A differential directed forgetting effect on inclusion and exclusion performance, irrespective of word type, was again found, $F(1, 54) = 4.53$, $p < .05$ (TBR-incl.: .28 ± .21, TBF-incl.: .22 ± .21; TBR-excl.: .06 ± .13, TBF-excl.: .08 ± .14). Thus, directed forgetting could be observed in inclusion performance, but not in exclusion performance. The directed forgetting effect (TBR-TBF performance) for inclusion performance appeared to decrease with level of dissociative style, as was evidenced by the group by instruction by test type interaction, $F(2, 54) = 4.94$, $p < .05$. In inclusion performance, irrespective of word type, low dissociative students showed most directed forgetting (TBR − TBF = .10), followed by high-dissociative students (.07) and patients (−.02). Directed forgetting in exclusion performance was largest for the patients (.05) and was reversed for high dissociative students (−.05) and low dissociative students (−.03). This pattern of results runs opposite to the predictions of the cognitive avoidance hypothesis.

Sex words were more often completed (both in inclusion and exclusion performance) by the patient group when they had to be forgotten than when they had

Table II. Proportions of Correctly Completed Word Stems (*SD*) of Neutral, Sex, and Threat Words in the Inclusion and Exclusion Instructions for the Three Groups

		Neutral		Sex		Threat	
		Inclusion	Exclusion	Inclusion	Exclusion	Inclusion	Exclusion
DID	TBR	.30 (.17)	.23 (.15)	.29 (.19)	.07 (.12)	.16 (.19)	.09 (.16)
	TBF	.29 (.17)	.19 (.11)	.43 (.25)	.05 (.11)	.09 (.16)	.00 (.00)
High	TBR	.39 (.17)	.14 (.16)	.34 (.25)	.03 (.08)	.19 (.20)	.00 (.00)
	TBF	.31 (.18)	.19 (.19)	.26 (.26)	.06 (.14)	.14 (.19)	.06 (.14)
Low	TBR	.38 (.19)	.07 (.11)	.34 (.21)	.02 (.10)	.12 (.15)	.00 (.00)
	TBF	.27 (.14)	.13 (.14)	.20 (.17)	.01 (.05)	.07 (.11)	.04 (.10)

Note: TBR, to-be-remembered; TBF, to-be-forgotten.

to be remembered (group × instruction × word type, $F(4, 108) = 3.16$, $p < .05$. Overall (inclusion and exclusion performance) directed forgetting of sex words appeared to decrease with increasing dissociative style (Fig. 1). Directed forgetting for other word types increased or remained approximately constant as a function of dissociative ability. Finally, the very high level of inclusion performance of sex words (due to the inability to forget, also in the TBF condition) by patients (.38 ± .23) resulted in a marginally significant group by test type by word type interaction, $F(4, 108) = 2.23$, $p = .07$. No other main or interaction effects were found to be significant in this analysis.

Conscious and nonconscious memory performances (Table III) largely mirrored inclusion and exclusion performances. Recollection (.20 ± .20) was higher than automatic memory performance (.09 ± .16), $F(1, 54) = 33.68$, $p < .001$. The interfering task did not raise nonconscious memory performance above baseline. Thus, a floor effect in this type of memory performance cannot be dismissed. Our hypotheses concerning directed forgetting, however, mainly focus on conscious memory performance, for which conclusions may still be drawn. The main effect of word type, $F(2, 108) = 37.52$, $p < .001$, and the interaction effect between type of memory performance and word type, $F(2, 108) = 16.42$ $p < 0.001$, were found

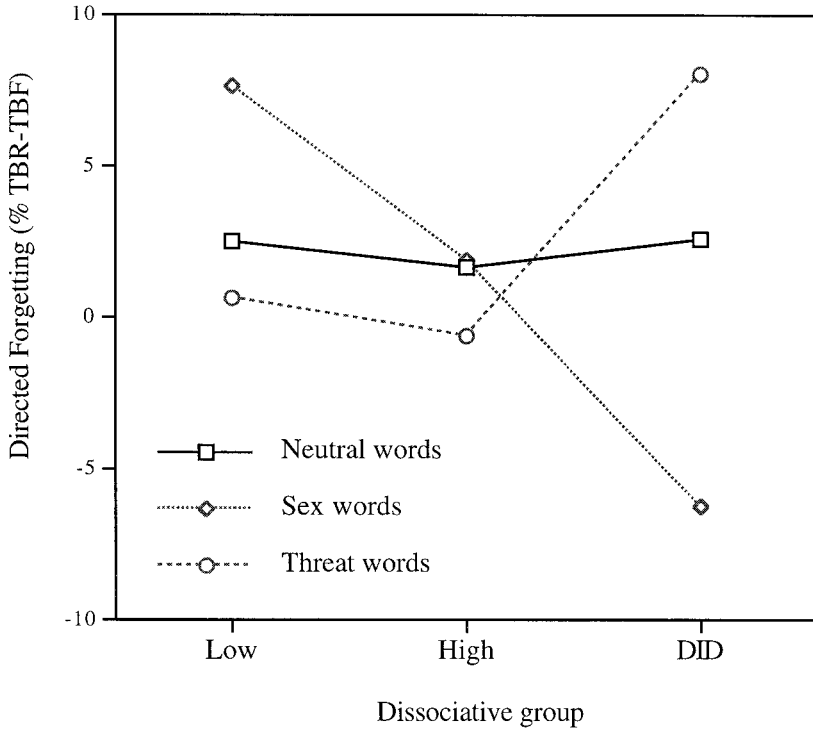

Fig. 1. Percentage of directed forgetting (TBR − TBF) in overall memory performance (averaged over inclusion and exclusion performance) for the three dissociative groups as a function of word type in Experiment 2.

Table III. Average (*SD*) Combined Conscious and Nonconscious Memory Performance of Neutral, Sex, and Threat for the Three Groups

		Neutral	Sex	Threat
DID	TBR	.19 (.17)	.15 (.20)	.12 (.17)
	TBF	.17 (.13)	.24 (.29)	.05 (.12)
High	TBR	.21 (.19)	.19 (.26)	.09 (.17)
	TBF	.19 (.18)	.15 (.22)	.09 (.17)
Low	TBR	.19 (.21)	.17 (.22)	.06 (.12)
	TBF	.15 (.15)	.10 (.15)	.05 (.10)

Note: TBR, to-be-remembered; TBF, to-be-forgotten.

again. Conscious recollection of sex words (.27 ± .22) was higher than of neutral words (.20 ± .19) and of threat words (.12 ± .17), whereas automatic performance of neutral words (.17 ± .16) was clearly higher than of sex (.05 ± .17) and threat words (.03 ± .10). A differential forgetting effect, $F(1, 54) = 4.81$, $p < .05$, again appeared in conscious (TBR − TBF = .06) and nonconscious memory performance (−.02).

The patients showed an overall inability, irrespective of word type, to ban words from conscious memory (TBR − TBF = −.03). High dissociative students showed less directed forgetting in conscious memory performance (.08) than low dissociative students (.11). Nonconscious memory performance (patients, .03; high, −.04; low, −.03) revealed the reverse pattern of directed forgetting, $F(2, 54) = 4.43$, $p < .05$. Only with sex words were there reversed directed forgetting effects in both conscious and nonconscious memory performance for the patients (see Table III). In all other combinations of word type, memory type, and subject group, performance was lower for TBF than for TBR words. This resulted in a word type by instruction by group interaction, $F(4, 108) = 3.87$, $p < .01$. The high recollection (.30 ± .24) of sex words by patients, irrespective of whether they had to be remembered or forgotten, again led to a marginally significant memory type by word type by group interaction, $F(4, 108) = 2.24$, $p = .07$.

Because dissociative style was correlated with anxiety, these results might also correspond to effects of anxiety on memory performance. Therefore, a 3 × 2 × 2 × 3 ANCOVA (group × instruction × test type × word type) with state anxiety as a covariate was performed to partial out the variance attributable to anxiety. In this analysis the effects of dissociation disappeared.

GENERAL DISCUSSION

The cognitive avoidance hypothesis for dissociative style seems to be contradicted, particularly in Experiment 2. Instead of an increased ability to ban material from conscious memory, subjects with a high dissociative style showed an inability to forget, especially sex words. Conscious memory performance of patients for to-be-forgotten sex words surpassed memory performance for all other word types, instructions, and groups. Overall memory performance of patients and high dissocia-

tive students was also higher than that of low dissociative students, yielding the unusual result that a clinical group outperforms a healthy, and younger, student group in almost every aspect of the task. Also in other fields of research (e.g., sleep learning; Eich, 1990) there seems to be evidence that dissociative ability corresponds to higher learning abilities. This suggests that the development of a dissociative disorder is associated with special memory ability.

Because the effects of dissociation disappear when anxiety is partialled out, it cannot be ruled out that anxiety is an important factor in the inability of DID patients to forget. Recent research (Wilhelm, McNally, Baer, & Florin, 1996) suggests that anxious subjects are characterized by an inability to inhibit processing of threat-related information. It may be that, for the DID patients, sex words in particular contained threat-related information, resulting in an inability to forget these words. Furthermore, some authors (Nijenhuis, Spinhoven, Vanderlinden, van Dyck, & van der Hart, 1998) argue that dissociation may be related to defense reactions to imminent threat. According to these authors, dissociative behavior is intrinsically related to anxiety. In this view, the disappearance of the effects of dissociation, when anxiety is partialled out, is a logical result of this intrinsic connection. This does not imply, however, that the effects of dissociation can be fully explained by the factor of anxiety alone.

In this experiment it is unlikely that anxiety is the primary personality trait responsible for the differential directed forgetting results (for a similar conclusion, see Cloitre et al., 1996). First of all, the rather modest correlations between state anxiety (as opposed to trait anxiety) and dissociation do not suggest that state anxiety might have been a major factor in the memory processes. Second, the decrease in the directed forgetting effect is most obvious for sex words. If anxiety and not dissociative ability were the main factor involved in the effect on the directed forgetting task, one would expect memory enhancement for anxiety-related words and not for sex words. Finally, the selection of subjects was based on dissociative style rather than on anxiety. Thus, the high anxious subjects in this experiment might not be representative for anxious persons in general, whereas they are representative for dissociation.

In the study by Cloitre et al. (1996), patients with a borderline personality disorder and with a history of childhood abuse showed mainly enhanced directed remembering skills, rather than enhanced directed forgetting skills, compared to similar patients without a history of childhood parental abuse. Although there was also some indication of higher learning abilities in the study done by Cloitre et al. for high dissociative patients than for low dissociative patients and students, their results do not fully agree with those reported here. Performance level of to-be-forgotten words did not seem to vary as a function of dissociative style in their study, whereas it increased in our study. Although the former group of patients had higher dissociation scores compared to the latter group and to a control group of students, it should be noted that the dissociative patients in our study may have differed in many other respects from Cloitre's patient group. Beside the differences in population, Cloitre et al. (1996) did not analyze directed forgetting for the negative (also threatening), neutral, and positive words separately. Their effects may be comparable to our results for TBF neutral and threat words, which remained

largely constant over the three dissociative groups of Experiment 2. The introduction of sex words in our experiment may thus be responsible for the disappearance of directed forgetting in the recollection performance of patients.

Because the DID patients do not seem to be characterized by a cognitive avoidance strategy, an alternative hypothesis seems called for to explain dissociative style. An explanation for the enhanced learning mechanisms of dissociative patients may be found in the activation/elaboration theory of Mandler (1979, 1980; Graf & Mandler, 1984). In this theory two learning mechanisms are postulated. Activation learning is the strengthening of existing associations and mainly contributes to nonconscious memory performance. Elaboration learning consists in the formation of new associations and forms a prerequisite for conscious memory performance. Application of this theory to the present results suggests that high dissociative subjects, and dissociative patients, have a higher general ability to elaborate than low-dissociative subjects. This notion is supported by the preliminary finding that working memory in which elaboration presumably takes place seems to have a higher capacity in high dissociative students than in low dissociative students (Elzinga, unpublished results). This would lead to the higher overall memory performance of high dissociative subjects. In Mandler's (1979, 1980, 1985) view, detection of discrepancies is one of the main causes for conscious elaboration. This could offer an explanation for the high memory performance of especially the to-be-*forgotten* sex words because for these patients (with possibly a history of sexual abuse) the instruction to forget sexual material might appear very incompatible to the content of the words. This line of thinking resembles the "white bear" effect that Wegner, Schneider, Carter, and White (1987) found in their well-known experiments of thought suppression.

An elaboration hypothesis could fully account for our memory results, but does not explain how distinct conscious states can come about in a dissociative disorder. Elaboration learning, however, fits into a larger theoretical framework for consciousness (Mandler, 1985, 1989; see also Phaf, Mul, & Wolters, 1994; Phaf & Wolters, 1997). Mandler regards all conscious experiences as constructed out of nonconscious elements activated in memory. These conscious contents are created to respond to momentary needs, concerns, and ongoing tasks and are not the result of nonconscious material crossing some threshold being pushed, elevated, or illuminated into consciousness. In this theory, conscious processes differ qualitatively from nonconscious processes. Conscious recollection in particular is a reconstruction of events from activated memory elements and schemata, which can also be responsive to some momentary concern or requirement. Thus, conscious recollection need not be an exact reproduction of an event, as if some video report has been made. According to Mandler, errors in recall might be constructions that, while factually erroneous, comply with such demands, as, for example, with the need to avoid negative emotional experiences.

The application of a "construction" hypothesis to dissociative disorders contrasts with the "cognitive avoidance" hypothesis by assuming that dissociative patients are better at constructing conscious experience instead of being more able to forget events from conscious memory. How, then, is this higher ability to construct conscious experience instrumental in avoiding negative emotional experiences?

Dissociative patients are assumed to be trained in constructing separate conscious experiences so that painful memories can be dissociated from the momentary experience by creating other states of consciousness. Because the system is engaged in these constructions, there is no room for (re)constructions of painful memories, resulting in an apparent amnesia for these memories. The need to create dissociated conscious experiences probably arises when memory traces related to the traumatic events are activated.

According to the construction hypothesis, dissociative patients may have developed in years of training completely dissociated systems of constructions. They may form a special selection of patients that are not very well able to discard painful experiences from conscious into nonconscious memory (there may be other patient groups that do this, but according to the construction hypothesis dissociative patients are not good in following this strategy). Instead, they are confronted very often (due to the strong memory storage) with these experiences and have to develop other strategies to avoid the distress associated with them. When different dissociated systems of constructions are incompatible such that they cannot be integrated into one overlapping system (as the construct of a loving father against the construct of a very brutal father who forces intimacy), dissociated identities might arise. The phenomenon of dissociation that results in this view is not a dissociation between conscious and nonconscious processes, but a dissociation between conscious constructions. Such a partitioning of conscious experience is in line with the original descriptions by Janet (1907) and with the neo-dissociation interpretation later presented by Hilgard (1977).

If the construction hypothesis concerning dissociative style could be generalized to dissociative patients, this might have profound implications for the treatment of such patients. Dissociative patients seem to be a special patient group to whom the schema of repression does not apply, and who might even be negatively affected by therapies aimed at (re)experiencing extremely emotional events, presumably from the past. According to the construction hypothesis, reexperiencing repressed memories might aggravate the severity of the dissociations because dissociative patients might react to this highly emotional experience by further dissociating this part from conscious experience. The recently observed dramatic rise in the number of reported ''alters'' might be related to an overenthusiastic application of trauma revivification as the treatment strategy of choice. A therapeutic strategy entailing a more cognitively oriented approach toward acceptance of painful memories could be more beneficial than a strong emotional therapy aimed at resurfacing of negative experiences.

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