Journal of Abnormal Psychology
2001, Vol. 110, No. 1, 151-156

0021-843X/01/$5.00 DOI: 10.1037//0021-843X.110.1.151

Directed Forgetting of Trauma Cues in Adults Reporting Repressed or Recovered Memories of Childhood Sexual Abuse

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An item-cuing directed forgetting task was used to investigate whether women reporting repressed (n = 13) or recovered (n = 13) memories of childhood sexual abuse (CSA) exhibit an avoidant encoding style (and resultant impaired memory) for trauma cues relative to women reporting no CSA experience (n = 15). All participants viewed intermixed trauma (e.g., *molested*), positive (e.g., *confident*), and categorized neutral (e.g., *mailbox*) words on a computer screen and were instructed either to remember or to forget each word. The results provided no support for the hypothesis that people reporting either repressed or recovered memories of CSA are especially adept at forgetting words related to trauma. These groups recalled words they were instructed to remember more often than words they were instructed to forget regardless of whether they were trauma related.

Few recent controversies in abnormal psychology have been as intense as the one concerning the veracity of repressed and recovered memories of childhood sexual abuse (CSA; e.g., H. G. Pope, 1997; K. S. Pope, 1996). According to one view, some CSA survivors acquire a dissociative coping style that renders it difficult for them to recall their abuse (e.g., Herman & Schatzow, 1987; Terr, 1991). Proponents of this view believe that repressed (or dissociated) memories remain largely unchanged by the passage of time, underlie certain inexplicable symptoms (e.g., sensory flashbacks), impair interpersonal functioning, and must be recovered and recoded into narrative form for healing to occur (e.g., Brown, Scheflin, & Hammond, 1998).

According to another view, there is no persuasive evidence for a special repression mechanism that selectively dissociates CSA memories, making them inaccessible to awareness (e.g., H. G. Pope, Hudson, Bodkin, & Oliva, 1998). Proponents of this view worry that at least some recovered memories of CSA may be false (e.g., Loftus, 1993; Schacter, 1996, 1999). To render meaningful their chronic psychological distress, some people may come to believe that their problems arise from repressed memories of CSA. They may acquire false beliefs about having been abused after having been exposed to either potentially suggestible psychotherapies or self-help books and television talks shows devoted to this topic (Heaton & Wilson, 1998).

Central to the first view is the hypothesis that CSA survivors, especially those who repress their memories of abuse, are especially adept at avoiding awareness of disturbing material, and this may arise because of impaired encoding or impaired retrieval or both. According to some theorists (Gelinas, 1983; Terr, 1991), children may endure chronic sexual abuse by developing an avoidant encoding style that enables them to disengage attention from disturbing happenings and direct it elsewhere. The ability to focus on doorknobs, wallpaper patterns, and so forth may attenuate the emotional impact of otherwise overwhelmingly upsetting episodes of abuse (Herman & Schatzow, 1987). Impaired encoding of these and other aversive episodes of an unhappy childhood may result in the impoverished autobiographical memory reportedly characteristic of CSA survivors (Harvey & Herman, 1994).

Alternatively, cognitive abnormalities in CSA survivors may arise from impaired retrieval processes rather than impaired encoding processes. Inhibitory mechanisms may prevent conscious recollection of disturbing events that have been encoded normally.

In a previous experiment, we tested whether psychiatrically impaired CSA survivors exhibit an avoidant encoding[1] style resulting in impaired memory for trauma cues (McNally, Metzger, Lasko, Clancy, & Pitman, 1998). CSA survivors with posttraumatic stress disorder (PTSD), psychiatrically healthy CSA survivors, and nonabused control participants performed an item-cuing directed-forgetting task that required them to view a series of trauma-related words (e.g., *molested*), positive words (e.g., *cheerful*), and neutral words (e.g., *cupboard*) on a computer screen. Immediately after each word's appearance, participants received instructions either to remember the word or to forget it. After this

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Preparation of this article was supported by National Institute of Aging Grant AGO8441.

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[1] Cognitive psychologists have argued that recall performance after an item-cuing procedure permits inferences about how the words were encoded (Basden, Basden, & Gargano, 1993). Remember words are usually recalled more often than forget words, and this difference is typically preserved on a recognition test (Johnson, 1994). If failure to recall forget words were attributable to their being subject to retrieval inhibition (i.e., they were encoded but inaccessible during recall testing), then exposure to them during the recognition task ought to release them from inhibition, thereby erasing the remember versus forget difference apparent on the recall test. Therefore, preservation of the remember versus forget difference on the recognition test implies that superior encoding of remember words relative to forget words accounts for recall performance.

encoding phase, they were asked to recall all words regardless of initial instructions. Consistent with previous directed forgetting studies (Johnson, 1994), psychiatrically healthy CSA survivors and nonabused control participants recalled remember words more often than forget words irrespective of word type. However, in dramatic contrast to the avoidant encoding hypothesis, the psychiatrically impaired CSA survivors did not exhibit recall deficits for trauma-related words; instead, they remembered them all too well while exhibiting recall deficits for positive and neutral words they had been instructed to remember. These findings run counter to the hypothesis that psychiatrically impaired survivors are especially adept at disengaging attention from threat cues, thereby impairing their memory for them.

In the present experiment, we investigated avoidant encoding in participants recruited on the basis of their trauma memory phenomenology, not psychiatric status (i.e., PTSD vs. no PTSD). Using our previous methods (McNally et al., 1998), we tested whether women reporting either repressed or recovered memories of CSA are especially good at forgetting trauma-related words relative to women reporting no abuse history. If the avoidant encoding hypothesis is correct, then people who believe they were sexually abused but who have no explicit, autobiographical recollection of the relevant events (repressed memory group) and those who report having recovered CSA memories (recovered memory group) should exhibit memory impairments for trauma-related words relative to other words and relative to participants reporting no abuse history (control group). Moreover, the data ought to conform to a linear function whereby this effect should be most prominent in the group whose members report the most severe amnesia for CSA (repressed memory group), least prominent in the control group, and intermediate in the group whose members report once having been amnesic for CSA (recovered memory group). That is, the ability to disengage attention from trauma words, thereby impairing their subsequent recall, should be more pronounced among individuals who have no memories of abuse (i.e., the repressed memory group) than among individuals whose memories are once again accessible (i.e., recovered memory group).

Method

Design

We used a 3 (group: repressed, recovered, control) × 2 (instructions: remember, forget) × 3 (word type: trauma-related, positive, neutral) design with repeated measurement on the second and third variables.

Participants

Individuals qualifying for the repressed memory, the recovered memory, or the control group had responded, respectively, to newspaper notices that requested adult, female volunteers who (a) feel they may have been sexually abused as children but are not sure, (b) have recovered memories of having been sexually abused as children, or (c) have no history of sexual abuse as children to participate in a study on memory.

Recruitment and testing of participants followed American Psychological Association ethical guidelines for use of human participants. They provided written informed consent and were paid $25.

Repressed memory group. The repressed memory group comprised 13 women who reported believing that they had been sexually abused as a child but were unable to recall the relevant abuse events. As evidence of their repressed memories, these participants cited a diversity of symptoms they thought indicated a CSA history (e.g., relationship problems, depressed mood, substance abuse). Some reported vague feelings of tension and uneasiness when near certain relatives who, they assumed, may have molested them.

Recovered memory group. The recovered memory group comprised 13 women who reported having recovered memories of CSA.

Control group. The control group comprised 15 women who denied having experienced CSA.

To characterize our participants further and to enable their comparison with participants in previous studies, we asked them to complete the civilian version (Vreven, Gudanowski, King, & King, 1995) of the Mississippi Scale for Combat-Related Posttraumatic Stress Disorder (Keane, Caddell, & Taylor, 1988), the Beck Depression Inventory (Beck & Steer, 1987), the Dissociative Experiences Scale (DES; Bernstein & Putnam, 1986), and the pathological taxon (Items 3, 5, 7, 8, 12, 13, 22, and 27) of the DES (DES-T; Waller, Putnam, & Carlson, 1996). The means and standard deviations for these measures, plus age and years of education, are shown in Table 1.

One-way analyses of variance (ANOVAs) revealed no significant differences ($ps > .05$) among the groups in age or years of education. Significant effects emerged for all clinical variables, and Tukey's honestly significant difference tests indicated that the repressed memory group reported more symptoms of PTSD, depression, dissociation, and pathological dissociation than did the control group ($ps = .001$–$.018$). The recovered memory group scored midway between the other two groups.

Materials and Procedure

We used the same materials and procedure as McNally et al. (1998). Hence, there were three word types: trauma related (e.g., *incest, abused*), positive (e.g., *elation, cheerful*), and neutral (e.g., *banister, stairs*); the words are listed in McNally et al. (1998). There were four sets of 15 words

Table 1
Means for Demographic and Psychometric Data

Variable	Group: Repressed	Group: Recovered	Group: Control	*F*	*p*
Age (years)					
M	36.4	46.4	37.4	3.15	.054
SD	10.2	10.2	12.9		
Education					
M	15.1	14.6	15.9	1.29	.286
SD	1.8	2.5	1.9		
CMISS					
M	108.2	92.5	77.5	8.53	.001
SD	26.5	15.2	12.9		
BDI					
M	19.9	11.1	9.1	4.59	.017
SD	13.3	7.4	6.9		
DES					
M	19.0	14.7	6.4	6.66	.004
SD	11.7	10.3	3.8		
DES-T					
M	14.8	8.3	3.0	10.11	.001
SD	8.2	8.2	2.7		

Note. CMISS = Civilian Mississippi Scale for Posttraumatic Stress Disorder (possible range: 35–175); BDI = Beck Depression Inventory (possible range: 0–64); DES = Dissociative Experiences Scale (possible range: 0–100); DES-T = Dissociative Experiences Scale, pathological taxon (possible range: 0–100). For age and education, $df = 2$ and 38, and for the clinical variables, $df = 2$ and 35 because of missing data.

each, and each set comprised 5 trauma words, 5 positive words, and 5 neutral words. Within each set of 15 words, mean frequency of usage (Francis & Kučera, 1982) did not differ ($ps > .05$) as a function of word type, and the mean frequency for the four subsets of 5 words of varying valence (i.e., trauma, positive, neutral) did not differ significantly ($ps > .05$). For example, the 5 trauma words that appeared in Set 1 did not differ on these variables from the 5 trauma words that appeared in Sets 2, 3, and 4.

Words from a set could appear in both the encoding phase and the recognition test or only in the recognition test as distractors. For example, one participant could receive Sets 1 and 2 during encoding and Sets 1, 2, 3, and 4 during recognition, whereas another participant could receive Sets 2 and 4 during encoding and all sets during recognition. Moreover, of the two sets a participant received during the encoding phase, all items from one set were followed by remember instructions and all items from the other set were followed by forget instructions; the allocation of sets to instructional condition was balanced across participants. We also balanced across participants which sets appeared in the encoding phase and which sets appeared only in the recognition test as distractor items.

Experimental words appeared for 2 s in white lowercase letters at center screen against a blue background, and instructions to remember (i.e., RRRR) or to forget (i.e., FFFF) appeared for 3 s in uppercase letters against a blue background.

The same two primacy buffer items (*apple, carrot*) began each encoding phase presentation sequence, and the same two recency buffer items (*celery, orange*) ended each encoding phase presentation sequence. We generated 12 random sequences of experimental words. Each word appeared in the encoding list as an "old" item for 6 sequences (three times followed by remember instructions and three times followed by forget instructions) and as a "new" distractor item for the other 6 sequences.

Procedure

After providing written informed consent, participants read the following instructions, based on MacLeod's (1989) instructions, on an IBM-compatible PC computer screen:

> This is a memory experiment. You will be seeing a list of 34 words, one at a time. Each word will appear for two seconds, and will be followed by an instruction lasting three seconds. You will be instructed either to REMEMBER or to FORGET each word. Because the list is long, and you will only be tested on the half you are told to remember, it is a good idea to follow the instructions. Try to remember the REMEMBER words for the test that will follow the list. Here is how the word-by-word instructions work. After each word has been shown for two seconds, either RRRR or FFFF will appear at the center of the screen for three seconds. If RRRR appears, try to remember the word you just saw—it will be on the test. If FFFF appears, you need not remember that word—it will NOT be on the test. The instructions are there to help you select the words to learn and remember from the list. Any questions?

During the encoding phase, participants saw two of the four word sets (i.e., 30 experimental words plus 2 primacy and 2 recency buffers). Buffer words were followed by RRRR instructions. Half of the words from each category were followed by RRRR instructions; the remaining words were followed by FFFF instructions.

The free-recall test immediately followed the encoding phase. The experimenter presented each participant with a blank sheet of paper and gave her 5 min to write down as many words as she could remember from the encoding list irrespective of whether the original instructions were RRRR or FFFF. All participants were told to guess if uncertain and not to worry about proper spelling. The experimenter requested clarification of any ambiguous responses. Variant spellings of experimental words were considered correct (e.g., *abuse* for *abused*).[2]

Results

For each participant, we calculated the proportion of trauma-related, positive, and neutral words recalled for the two instructional conditions. Mean proportion of words recalled as a function of group (repressed, recovered, control), instructions (remember, forget), and word type (trauma related, positive, neutral) are shown in Table 2.

According to the avoidant encoding perspective, the greater the severity of (reported) traumatic amnesia, the less a participant should recall trauma words relative to nontrauma words. Therefore, this relative memory deficit for trauma words should be greater in people whose CSA memories remain inaccessible (repressed memory participants) than in those whose CSA memories are no longer inaccessible (recovered memory participants), and it should be least apparent in people who lack the motivation to avoid encoding trauma words (control participants).

We tested three hypotheses derived from the avoidant encoding perspective. Because we tested specific predictions with focused contrasts, our tests were one-tailed, and we calculated effect size r for each contrast (Rosenthal & Rosnow, 1991, pp. 494–496). Focused contrasts provide a statistically more powerful approach to hypothesis testing than unfocused omnibus ANOVAs followed by post hoc tests (Rosenthal & Rosnow, 1985).[3]

First, avoidant encoding of trauma cues should reduce recall of both trauma-remember and trauma-forget words, thereby diminishing the directed forgetting effect for trauma words relative to nontrauma words, and this pattern should be most apparent in the repressed memory group and least apparent in the control group. To test whether the data conformed to this linear pattern, we first created three directed forgetting variables by subtracting the proportion of forget words recalled from the proportion of remember words recalled for the trauma-related, positive, and neutral word types. We then created an L score (a new variable) for each participant by first multiplying the directed forgetting variable for trauma-related, positive, and neutral words by the contrast weights -2, $+1$, and $+1$, respectively, and then summing the products. The larger this L score, the greater was the directed forgetting effect for nontrauma words relative to trauma words. Applying contrast weights of -1, 0, and $+1$ to the mean L scores of the

[2] We also administered cued-recall and recognition tests. The patterns were the same as for free recall. Therefore, as in our previous report, we present only the free-recall data (McNally et al., 1998).

[3] Because some readers may be unfamiliar with focused contrast analyses, we also conducted a traditional omnibus 3 (group) × 2 (instructions) × 3 (word type) ANOVA with repeated measurement on the last two variables. Two effects were significant in the ANOVA: instructions, $F(1, 38) = 16.25$, $p = .001$, and word type, $F(2, 76) = 20.70$, $p = .001$, whereas the others were not: group, $F(2, 38) = 0.13$, $p = .88$, Group × Instructions, $F(2, 38) = 0.37$, $p = .69$, Group × Word Type, $F(4, 76) = 1.61$, $p = .18$, Instructions × Word Type, $F(2, 76) = 2.11$, $p = .13$, Group × Instructions × Word Type, $F(4, 76) = 1.23$, $p = .30$. The significant effect of instructions was due to participants recalling more remember words than forget words (i.e., a standard directed forgetting effect), and the significant effect of word type was due to participants recalling fewer positive words (.20) than either trauma-related words (.34; $p = .001$) or neutral words (.34; $p = .001$), as revealed by post hoc contrasts. The significant effect of instructions indicates that we replicated the basic directed forgetting effect.

Table 2
Mean Proportions of Words Recalled as a Function of Group, Instructions, and Word Type

Instructions	Trauma	Positive	Neutral
	Repressed memory group		
Remember			
M	.48	.22	.46
SD	.25	.22	.29
Forget			
M	.26	.11	.29
SD	.22	.16	.21
	Recovered memory group		
Remember			
M	.37	.25	.49
SD	.18	.18	.30
Forget			
M	.26	.14	.17
SD	.22	.15	.16
	Control group		
Remember			
M	.33	.31	.40
SD	.24	.25	.29
Forget			
M	.32	.17	.23
SD	.24	.17	.15

control (Rosenthal & Rosnow, 1991, p. 473), recovered, and repressed groups, respectively, we obtained no support for this hypothesis, $t(38) = -1.54$, *ns*, $r = .18$.

Second, individuals characterized by an avoidant encoding style should be reluctant to rehearse trauma-remember words, thereby resulting in poorer recall of trauma-remember words relative to nontrauma-remember words. To test this hypothesis, we created an *L* score for each participant by applying the contrast weights −2, +1, and +1 to the proportion of trauma-remember, positive-remember, and neutral-remember words recalled, respectively, and then summing the products. The larger a participant's *L* score, the more pronounced the recall deficit for trauma-remember words. Applying contrast weights of −1, 0, and +1 to the mean *L* scores of the control, recovered, and repressed groups, respectively, we obtained no support for this hypothesis, $t(38) = -1.78$, $p = .95$, $r = .28$.

Third, individuals characterized by an avoidant encoding style should be especially adept at disengaging attention from trauma-forget words and, therefore, should recall fewer trauma-forget words than nontrauma-forget words. Using the same contrast weights as before, we obtained no support for this hypothesis, $t(38) = 0.67$, *ns*, $r = .11$.

We tested which individual difference variables best predicted a participant's ability to forget trauma-related words. A participant's *L* score for the forget words indicates the extent to which she recalled trauma-related words poorly relative to nontrauma words. Correlations between this *L* score and the six variables listed in Table 1 were all nonsignificant. The largest correlations were for DES-T, $r(36) = .28$, and DES, $r(36) = .26$ ($ps < .10$, two-tailed).

Discussion

We obtained no support for the hypothesis that people reporting either repressed or recovered memories of CSA are especially adept at forgetting words related to trauma. Neither focused contrast analyses nor traditional ANOVA (see Footnote 3) yielded evidence in favor of avoidant encoding in either group reporting CSA. Indeed, their directed forgetting performance was similar to that of nonclinical participants in experiments involving emotionally neutral material (Johnson, 1994). They recalled remember words better than forget words irrespective of word type.

The repressed memory group scored significantly higher than the control group on all clinical measures, and the recovered memory group scored more than twice as high (albeit nonsignificantly) as the control group on the DES. Elevated DES scores are difficult to interpret. Whereas they may signal propensity to repress memories, they also predict memory distortion, at least in nonclinical participants (e.g., Clancy, McNally, & Schacter, 1999; Heaps & Nash, 1999).

Our findings bear comparison with related studies on directed forgetting. Women with borderline personality disorder who had been physically or sexually abused as children recalled more remember words than did those with borderline personality disorder who had no abuse histories (Cloitre, Cancienne, Brodsky, Dulit, & Perry, 1996). The meaning of this finding is unclear, but Cloitre et al. suggested that individuals with an abuse history may become especially proficient at encoding nontraumatic cues as a psychological defensive maneuver. In contrast to Cloitre et al.'s suggestion, precisely the opposite pattern occurred in our previous study: CSA survivors with PTSD exhibited poor recall for the positive and neutral words they were instructed to encode and remember, whereas they easily encoded and remembered trauma-related words, including those they were instructed to forget (McNally et al., 1998).

Using directed forgetting methods very similar to ours, Korfine and Hooley (2000) found that individuals with borderline personality disorder recalled significantly more threatening "borderline" words (e.g., *suicidal, abandon*) that they had been instructed to forget than did control participants. Given the reported connection between childhood abuse and this diagnosis (Herman, 1992, pp. 123–126), Korfine and Hooley's data may provide further evidence against the hypothesis that people exposed to early childhood trauma are especially adept at forgetting disturbing information.

In contrast to the memory abnormalities exhibited by CSA survivors with PTSD in our previous study (McNally et al., 1998), participants reporting either repressed or recovered memories of CSA in this study exhibited neither enhanced nor impaired memory for trauma (or nontrauma) words. These findings seem inconsistent with the views of some theorists that severity of trauma drives repression (e.g., Herman & Schatzow, 1987). That is, severity of trauma presumably causes individuals to repress their horrific memories, yet the memory functioning of our repressed and recovered memory participants was normal relative to the memory functioning of individuals with CSA-related PTSD (McNally et al., 1998). If one assumes that our participants are, indeed, survivors of CSA, then one would have expected aberrant memory functioning, but this did not happen. Directed forgetting data, however, are not a source of "lie detection." The failure of our

participants to exhibit impaired memory for trauma words does not mean that their memories of abuse are false.

Another difference between the present results and those of our previous experiment concerns the performance of the nontrauma-exposed control groups. In our previous experiment (McNally et al., 1998), control participants recalled more trauma-remember words than trauma-forget words (.47 vs. .25), whereas in the present experiment they did not (.33 vs. .32). We have no explanation for this.

A group of CSA survivors who had always remembered their abuse might have been a better comparison group than one comprising individuals who denied a history of CSA. Although we did not have such a group in this experiment, 11 of the 12 CSA-exposed but psychiatrically healthy participants in our previous experiment had always remembered their abuse, and they had participated in the identical experimental procedure used here. The memory performance of these CSA survivors with continuous memories was very similar to that of the repressed and recovered memory participants in the present experiment. Their data were as follows: For trauma-related words, remember, $M = .33$, $SD = .24$, forget ($M = .24$, $SD = .14$); positive words: remember ($M = .30$, $SD = .21$), forget ($M = .16$, $SD = .17$); neutral words: remember ($M = .42$, $SD = .24$), forget ($M = .18$, $SD = .16$). Indeed, these data are nearly identical to those of the recovered memory group (see Table 2).

The clinical literature on traumatic amnesia is ambiguous with regard to whether mechanisms of forgetting involve deliberate attempts to expel disturbing memories from awareness ("suppression") or whether they involve an unconscious, automatic process ("repression"; Freyd, 1996, pp. 14–27; Schacter, 1996, pp. 252–264) or both. Clearly, the directed forgetting paradigm provides a better model for deliberate rather than unconscious attempts to attenuate encoding of disturbing material.

Three caveats must be mentioned. First, cognitive abnormalities in people reporting repressed or recovered memories of CSA may arise from an inability to access encoded information about trauma rather than from avoidant encoding. Item-cuing directed-forgetting procedures are not the best method for testing hypotheses about such "retrieval inhibition" (Basden et al., 1993; Johnson, 1994). In contrast, block cuing, in which participants are shown an entire block of words before receiving a forget instruction, is well suited for testing hypotheses about difficulties accessing encoded, affectively charged information (Myers, Brewin, & Power, 1998).

Second, participants were exposed only to words, and lexical trauma cues are pale proxies for the autobiographical events that these individuals are said to have repressed or repressed and later recovered. In contrast, if certain individuals can disengage attention from genuine threat cues, they should easily be capable of disengaging attention from mere words related to threat. Nevertheless, one must be especially careful when generalizing from the laboratory to events in everyday life, especially traumatic ones.

Third, participants were far less distressed than they would have been during any abuse episodes, and differences in emotional state in the laboratory and in abuse situations may affect how trauma cues are encoded and later remembered. In contrast, emotional arousal would ordinarily be expected to facilitate encoding of the core features of the experience, rendering it more, not less, accessible later.

In summary, our data do not support the hypothesis that people reporting repressed or recovered memories of CSA are especially adept at avoiding encoding, and therefore not recalling, cues related to trauma. With few exceptions (Clancy, Schacter, McNally, & Pitman, 2000; McNally, Clancy, Schacter, & Pitman, 2000), the "recovered memory debate" has rarely been informed by experimental data from individuals reporting recovered (or repressed) memories. Further efforts to elucidate memory functioning in these individuals is warranted.

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Received March 30, 1999
Revision received July 14, 2000
Accepted July 15, 2000 ■