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Perspectives on Memory for Trauma and Cognitive Processes Associated with Dissociative Tendencies

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SUMMARY. Cognitive science approaches can inform research in traumatic stress studies by articulating separate scientific issues that may be relevant to understanding alterations in memory and awareness for trauma. This article will first address general issues about disrupted memory and "knowledge isolation" for trauma, as well as introduce specific aspects of "betrayal trauma theory" (Freyd 1994, 1996) that inform our understanding of memory impairment. According to betrayal trauma theory, a potent motivation for knowledge isolation (including amnesia, dissociation, and unawareness) in the face of trauma is to preserve apparently necessary human relationships in which betrayal occurs. Results from three recent laboratory investigations of cognitive processes associated with dissociative tendencies are summarized. These laboratory investigations suggest that the attentional capacities of high dissociators are impaired under conditions of selective attention, but not divided attention. Furthermore, in our laboratory tasks high dissociators have impaired memory for emotionally charged words associated with sexual assault and abuse (e.g., "incest") but not neutral words, as compared with low dissociators. The findings suggest that

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high dissociators use divided attention and multi-tasking as a way to control the flow of information. Such a view is consistent with betrayal trauma theory. Though in its infancy, this research draws on cognitive science and observations of traumatic response and offers much promise. [Article copies available for a fee from *The Haworth Document Delivery Service*: 1-800-342-9678. E-mail address: <getinfo@haworthpressinc.com> Website: <<http://www.HaworthPress.com>> © 2001 by *The Haworth Press, Inc.* All rights reserved.]

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A cognitive science perspective is inherently analytic. That is, cognitive scientists will attempt to identify and analyze the underlying components of cognitive processes and structures. This perspective offers the promise of bringing clarity and scientific precision to complex phenomena such as memory and attention for trauma, especially if this componential and scientific approach is ultimately used in conjunction with a variety of other approaches and sources of knowledge about trauma. In this article we draw on the conceptual and methodological tools of cognitive science as we examine memory for trauma and the cognitive processes associated with dissociative tendencies.

MEMORY FOR TRAUMA

In 1992, Frank Fitzpatrick's recovered memories of childhood sexual abuse rocked the mental health and legal professions. This was not the first case of recovered memories for sexual abuse by any means, but it was a dramatic one. Dozens of victims of the Reverend James R. Porter began to come forward only after Fitzpatrick, a Rhode Island insurance adjuster, acted on his own newly recovered memories. Most of the victims said they had always remembered the abuse, but others, like Fitzpatrick, had forgotten it for more than 20 years (Fitzpatrick, 1994; Goleman, 1992).

How and why would anyone forget something so seemingly significant as childhood molestation and then remember it decades later? Fitzpatrick's memories were corroborated by the reports of other victims and by Porter's own statements. But in many other cases the truth is difficult to determine. There may be little or no corroboration. The alleged perpetrator often vigorously denies the accusation, and the memory may be declared to be a product of therapeutic suggestion. Are these memories true or false? Fitzpatrick's reve-

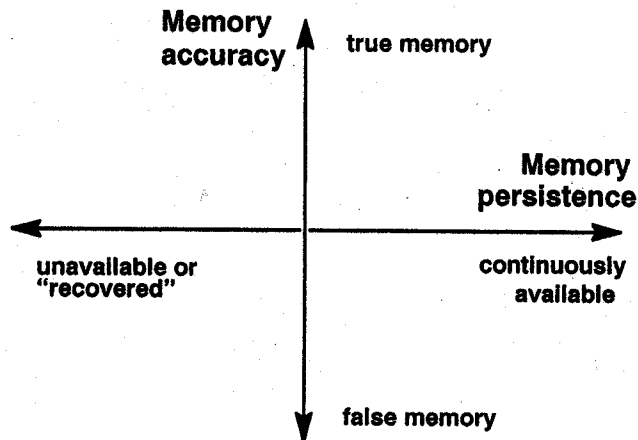
lations added fuel to a smoldering controversy that was soon to burst into flames, the now familiar dispute about recovered memories. By the mid-1990s there was a vitriolic and confusing controversy about memory and trauma that extended from professional venues to the popular media (see Beckett, 1996; Bowman & Mertz, 1996; DePrince & Freyd, 1997; Enns, McNeilly, Corkery, & Gilbert, 1995; Freyd, 1996; 1998; Gleaves & Freyd, 1997; Gleaves, 1996; Loftus, 1993; Loftus & Ketcham, 1994; Pope, 1996, 1997; Pope & Brown, 1996; Schefflin & Brown, 1996, Stanton, 1997).

As we approach the end of the century, some of the chaos is dissipating, and all parties to the debate have gained some knowledge and humility. Scholars have reminded us that the study of traumatic stress has a long history. In the 19th century and again after both world wars, psychiatrists and psychologists grappled with many of the issues that are troubling us now (Herman, 1992; van der Kolk, 1987). We have learned that exposure to trauma can profoundly alter both individuals and larger social groups, and that one kind of change affects our attention, perception, and memory (see, e.g., Arrigo & Pezdek, 1998; Elliott, 1997; Freyd, 1996; Herman, 1992; McFarlane & van der Kolk, 1996).

We have learned to step back from the conceptual muddle that emerges under conditions of heated disagreement and instead untangle some separate issues. These are deeply perplexing and slippery topics. What is the nature of memory, and how is it changed by exposure to trauma? How do the awareness and memory of trauma influence the possibility of healing or prevention? To define more precisely what we know and do not know, we must untangle the several issues involved and ask scientifically tractable questions. First, we must distinguish memory phenomena from their underlying motivations and mechanisms (Freyd, 1996). The phenomena are apparent forgetting and later remembering a significant event (or series of events). Why they occur is a question of motivation, and how they occur a question of mechanisms.

In describing the phenomena of recovered memory, it is critical to distinguish between two dimensions: accuracy (how true or false is a memory?) and persistence (how accessible is a memory to explicit recall?). Figure 1 illustrates the two separate dimensions of memory (also see Freyd, 1998). The two dimensions of persistence and accuracy are not necessarily correlated. There is no good evidence that the accuracy of a memory depends on whether it is experienced as continuously available or as recovered after years of forgetting (see Dalenberg, 1996; Pope & Brown, 1996; Schefflin & Brown, 1996; Williams, 1995). Furthermore, we can usually measure only perceived persistence, and people are often mistaken about that. They may believe they have always remembered something they have only recently recalled, or believe that they have only recently learned for the first time about an event

FIGURE 1. Schematic Depiction of Two Conceptually Separable Dimensions of Memory That Are Often Confused with One Another in the Context of the Debate About Recovered Memories of Abuse



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they once described to another person (see Schooler, 2001, in this volume). Therapists should be skeptical about all uncorroborated memories, whether they are newly recovered or not. Any memory, even of good events, can be true or false or a mixture of the two. There are no general rules, and we must live with uncertainty. Much harm can be done by premature efforts to validate or invalidate, judge or label memories.

There is nearly a century of research on nontraumatic memory and its fallibility and accuracy. Perhaps the most exciting development to emerge in the second half of the 1990s is the explosion of empirical research on issues of memory malleability, memory persistence, and memory for trauma. The challenge of understanding memory and awareness for trauma requires a truly cross-area approach in which knowledge from various fields is brought to bear on these complex and important issues. Particularly promising in this area is the intersection of traumatic stress studies and cognitive science. As evidenced by this volume, leading trauma researchers and cognitive psychologists are increasingly taking on the very difficult and important task of investigating memory for trauma using research methodologies from cognitive science.

We now have a much clearer picture of the conditions under which human

memory is vulnerable to suggestion and distortion (see Oakes & Hyman, 2001, this volume; Pezdek, 2001, this volume). We are beginning to understand the relevance of factors such as event plausibility and social authority. Similarly, we now have access to a substantial number of studies documenting the phenomena of forgetting and remembering trauma, not just the trauma of sexual abuse but a variety of traumas (see Butler, 1996; Cheit, 1998; Corwin & Olafson, 1997; Freyd, 1996; Loftus, Polonsky, & Fullilove, 1994; Kardiner, 1941; McFarlane & van der Kolk, 1996; Sargent & Slater, 1941; Schefflin & Brown, 1996; Schooler, Bendixsen, & Ambadar, 1997; Schooler, 2001, this volume; Williams, 1994; 1995). Additionally, research suggests the rates of forgetting vary for different types of trauma (see Elliott, 1997), and this is very interesting and relevant to the questions of motivations and mechanisms (Freyd, 1996). Through new research in cognitive science and cognitive neuroscience, we are making progress on some of the mechanisms and neuroanatomical structures that play a role in alterations of memory (see Anderson, 2001, this volume; Brewin, 1996; Brewin & Andrews, 2001, this volume; Morton, 1994; Schacter, 1996; Schooler, 2001, this volume; Spiegel, 1997). For example, we have recently found a relationship between basic mechanisms of attention and individual differences in reports of dissociative experiences. Some of our findings and their implications are summarized in the next section of this article.

There are also new perspectives and data on the question of motivations for forgetting traumatic experiences. From psychoanalytic conceptions of avoidance of overwhelming pain or conflict, through innovative theories about our need to believe in a safe world, we have a variety of theories to explore with empirical investigations.

In our own work in this area we have begun to test hypotheses arising from *betrayal trauma theory* (Freyd 1994, 1996), focusing on betrayals of trust such as those that occur in child sexual abuse. According to *The New York Times*:

Mr. Fitzpatrick's retrieval of the repressed memories began, he said, when "I was feeling a great mental pain . . ." Mr. Fitzpatrick . . . slowly realized that the mental pain was due to a "betrayal of some kind," and remembered the sound of heavy breathing. "Then I realized I had been sexually abused by someone I loved," said Mr. Fitzpatrick. (Goleman, 1992, p. B5)

Betrayal trauma theory posits that knowledge isolation (including memory repression, dissociation, and unawareness) serves a survival function in necessary human relationships in which betrayal occurs. Human beings are often exquisitely sensitive to betrayal or cheating; we detect the betrayal and then respond with strong negative emotions that guide us away from the betrayer. However, under some circumstances, this very sensitivity can cause us more

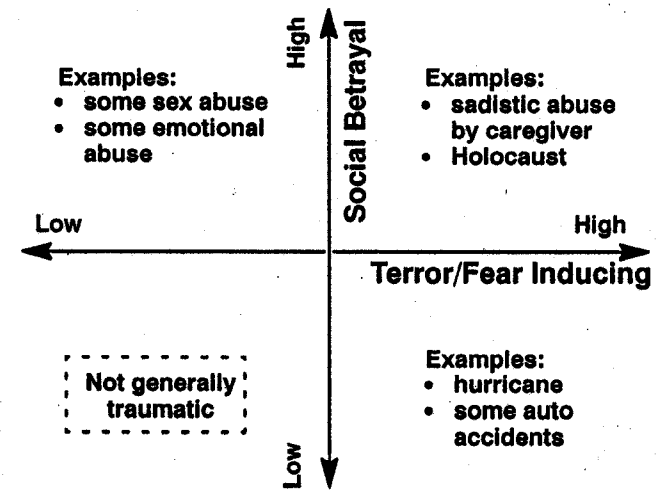
problems than it solves. It can risk a relationship we may need or believe we need. Child abuse by a caregiver is especially likely to produce such an implicit social conflict for the victim. Withdrawing from a caregiver on whom the child victim depends could further threaten the child's life. For the child who depends upon an abusive caregiver, the situation demands that information about the abuse be blocked from mental mechanisms that control attachment (bonding) behavior. The information that gets blocked may be partial (for instance, blocking emotional responses only), but in many cases the information that gets blocked will lead to a more profound disruption in awareness and autobiographical memory. Consistent with the prediction that the closeness of the victim-perpetrator relationship impacts probability of amnesia, amnesia rates across a variety of studies appear to be higher for parental or incestuous abuse than non-parental or non-incestuous abuse (see Freyd, 1996).

Betrayal also seems to be a central factor in many recovered memory cases involving adults traumatized while in situations of dependence. Vietnam veterans with posttraumatic stress disorder (PTSD) often recall a betrayal by a commanding officer only many years later (Shay, 1994). Battered wives may forget and then remember abuse by their husbands. At the University of Oregon, we are running, in collaboration with colleagues, studies looking at relationship dependence, memory persistence, and other factors in greater detail. Preliminary results support our prediction that the greater the victim's dependence on the perpetrator, the less persistent are memories of abuse (see also Freyd, 1996, for re-analyses of published data sets supporting this premise). Similarly, the data collected by Elliott (1997) on relative rates of delayed recall for different types of trauma are suggestive that memory for trauma varies as a function of the degree of social betrayal.

The role of betrayal in traumatic forgetting has implications for clinical conceptualization and treatment. It suggests that traumas leading to psychic disorders arise from two distinct dimensions of harm: life-threat and social-betrayal (Freyd, in press). From this viewpoint the symptom cluster known as post-traumatic stress disorder may better be understood as arising from two conceptually independent dimensions of trauma (see Figure 2). The dimension of life-threat may be primary for symptoms of fear, anxiety, hyperarousal, and intrusive memories. The dimension of social-betrayal may be primary for symptoms of dissociation, amnesia, numbness, and constricted or abusive relationships. High levels of both life-threat and social-betrayal characterize many of the most severe traumas (e.g., rape, much child abuse, many combat experiences, the Holocaust). With both dimensions present, we expect to see both classes of symptoms present.

Clinicians may be most effective when they understand the separate origins of these different sources of symptoms. We currently have reasonably

FIGURE 2. The Two-Dimensional Model of Trauma



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effective methods available for treating the fear, anxiety, and hyperarousal associated with post traumatic stress disorder. Numbing, dissociation, and avoidance have been more difficult to treat. According to betrayal trauma theory, survivors of childhood abuse (and of adult betrayal traumas including battering and some combat situations) have learned to cope with an inescapable social conflict by being disconnected internally. The treatment of these symptoms, according to betrayal trauma theory, will require a focus on social relationships and related cognitive mechanisms used to support such relationships. The treatment goals and methods for promoting internal integration and deeper external connection need not be at odds with the treatment goals and methods for addressing high levels of anxiety, fear, and hyperarousal; however, these goals and methods do have different foci. For instance, clinicians may want to focus on promoting internal integration through the fundamentals of a healthy relationship. Such a relationship supports the explicit verbalization of the traumatic experiences, promoting internal re-coding of disjointed and fragmentary sensory memories. A healthy relationship also can be used by the clinician to encourage the patient's active and appropriate use of trust and reality assessment mechanisms. The potential to heal internal disconnection is almost surely going to be most fully realized in the context of what was so broken in the first place: intimate and trusting relationships.

COGNITIVE PROCESSES ASSOCIATED WITH DISSOCIATIVE TENDENCIES

We have applied a cognitive science approach to predictions derived from betrayal trauma theory. In particular, we have been interested in the exploration of cognitive processes associated with dissociation. Dissociation has been defined as the lack of integration of thoughts, feelings and experiences into the stream of consciousness. Most people report some dissociative experiences, such as "highway hypnosis" (when one apparently loses conscious awareness of driving for some period of time). However, individual differences in dissociative tendencies have been consistently reported in the literature (see Freyd, 1996, for a review). A number of studies indicate that dissociative tendencies appear to be very high in populations of trauma survivors, including research in which there is external corroboration for the trauma (e.g., see Bremner et al., 1992; Carlson & Rosser-Hogan, 1993; Marmar et al., 1994; Putnam & Trickett, 1997).

Dissociation likely plays a role in various psychiatric disorders, including posttraumatic stress disorder (PTSD) (e.g., Bremner et al., 1992; Carlson & Rosser-Hogan, 1993; Elliott & Briere, 1995; Koopman, Classen & Spiegel, 1994; Marmar et al., 1994; Saxe et al., 1993) as well as the dissociative disorders. Given that higher levels of dissociation are found in trauma populations, and in individuals who meet the criteria for PTSD and the dissociative disorders, understanding dissociation is critical to both research and clinical practice. Despite its clinical importance, dissociation has not been well understood at the cognitive level. While a number of studies provide some hints about the cognitive bases of dissociation and dissociative disorders (e.g., Eich, Macaulay, Lowenstein, & Dihley, 1997; Hilgard, 1986; Kihlstrom & Couture, 1992; Schacter, Kihlstrom, & Kihlstrom, 1989; Litz et al., 1996; Nissen, Ross, Willingham, MacKenzie, & Schacter, 1988), we sought to extend this understanding based on a betrayal trauma theory framework.

Betrayal trauma theory predicts that dissociating information from awareness is mediated by the threat that the information poses to the individual's system of attachment (Freyd, in press, 1994, 1996). Dissociation is implicated as an important factor in removing threatening information from awareness; however, the role of, and mechanisms that underlie, dissociation remain unclear. We posit that basic cognitive processes involved in attention and memory most likely play an important role in dissociating explicit awareness of betrayal traumas. Here we report on three studies from our laboratory that have investigated the role of basic cognitive processes associated with individual differences in dissociative tendencies.

DISSOCIATIVE TENDENCIES AND SELECTIVE ATTENTION

In the first study (Freyd, Martorello, Alvarado, Hayes, & Christman, 1998) we focused on the basic function of selective attention: the ability to select willfully certain information while inhibiting the selection of other information simultaneously available. Humans generally are impressive at selective attention but it is not an all-or-none ability. While some information may be selected, other information may nonetheless intrude. We hypothesized that dissociative tendencies would be systematically related to selective attentional mechanisms.

We assessed dissociative tendencies using the Dissociative Experiences Scale (DES) (Bernstein & Putnam, 1986). The DES is a 28 item self-report measure that assesses dissociative experiences such as dissociative amnesia, gaps in awareness, derealization, depersonalization, absorption, and imaginative involvement. The DES has been used in over 250 published studies in a wide range of populations. The DES has been shown to have good reliability (internal consistency and test-retest), as well as good convergent validity (see Briere, 1997, for a review). Participants are instructed to indicate the percentage of time for which each item pertains to them. Items include, "Some people have the experience of feeling that other people, objects, and the world around them are not real" and "Some people find that they have no memory for some important events in their lives" (for example, a wedding or graduation). Carlson and Putnam (1993) note that scores above 20 are indicative of highly dissociative experiences about which a clinician would want to gather more information. Scores below 10 are considered in the range of normal dissociative experiences (Carlson & Rosser-Hogan, 1993).

We assessed attentional processes using the Stroop task (Stroop, 1935). The Stroop task is the classic experimental demonstration of our ability to selectively attend and of our inability to completely exclude the unattended stimulus from impacting performance. In the standard Stroop task, participants are asked to name the ink color of a list of words or strings of letters printed in different colors. In its simplest form in the experimental condition, the words are color names (e.g., "blue" or "yellow") and those words are incongruent with the ink colors (thus the word "blue" is printed in yellow ink, while the word "yellow" is printed in red ink). In a control condition, the words are neutral terms (e.g., "book" or "river") or non-word stimuli such as strings of identical letters (e.g., "xxxxx") and the ink colors are randomly assigned to the different words or strings of letters. Participants attempting to name the ink color take longer when the ink colors are paired with incongruent color words than when the ink colors are paired with neutral words, strings of letters, or congruent color terms.

The fact that participants can name the ink colors and inhibit naming the words themselves illustrates the power of selective attention. However, the

fact that the meaning of the color words apparently interferes with ink naming demonstrates the inability to completely exclude information that is not chosen for selection. The Stroop paradigm, one of most widely used methodologies for studying selective attention, seemed a good starting place for exploring the hypothesis that participants varying in dissociative tendencies would show a difference in basic attentional processing.

Using a standard Stroop task, Freyd et al. (1998) compared "Stroop interference" for high versus low dissociators. The standard Stroop interference is the difference in reaction time to name a color that is incongruent with the word meaning (e.g., green appears in red ink) from a baseline condition (e.g., name the ink color for a row of xxx's). Forty high and 40 low dissociators were selected from a sample of 154 college students (see Table 1 for participant statistics).

Participants who scored high on the Dissociative Experiences Scale (DES) showed greater Stroop interference for conflicting color terms than individuals with low DES scores. High DES participants took longer to name the ink colors when the lists were conflicting color terms (such as naming the color "yellow" when the word "red" was printed in the ink color yellow) than did the low DES participants. For all other categories but the conflicting color terms, reaction times for high dissociators were equivalent to or slightly faster than the reaction times of the low dissociators, indicating that the increased interference effect is not accompanied by confounding factors such as generalized slowing among the high DES participants (see Table 2).

The results from Freyd et al. (1998) suggested a basic relationship between selective attention and dissociative tendencies: that people with high dissociative tendencies have disruptions of consciously controlled attentional abilities. Notably, the disruptions in attentional abilities were unrelated to emotional content. However, many questions remained, including whether the disruptions in attentional abilities would occur across attentional contexts with different task demands.

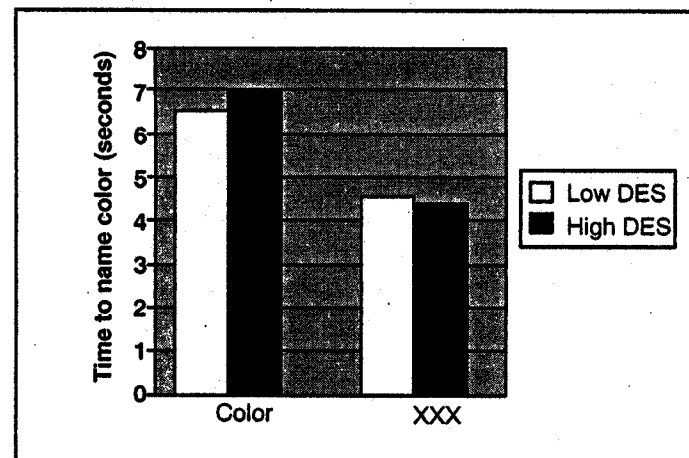
TABLE 1. Descriptive Statistics for the High and Low DES Group (Freyd et al., 1998)

	Low DES Group	High DES Group
Number	40	40
Mean	5.56	32.50
Median	5.98	30.62
Std. Dev.	2.13	7.68

TABLE 2. Mean Ink-Naming Times (in Seconds) and Standard Deviations for Lists of 8 Words Grouped by Word Categories (Freyd et al., 1998)

Category	low DES group	high DES group
	Time (SD)	Time (SD)
Color	6.50 (1.15)	7.03 (1.51)
X's	4.62 (0.81)	4.51 (0.89)
Kinship	4.11 (0.63)	4.10 (0.74)
Animal	4.80 (0.93)	4.78 (0.86)
Household	4.91 (1.01)	4.65 (0.89)
Space	4.57 (0.72)	4.59 (0.80)

FIGURE 3. Ink-Naming Times for 40 High- and Low-DES College Students in the Stroop Task (Freyd et al., 1998)



DISSOCIATIVE TENDENCIES, SELECTIVE AND DIVIDED ATTENTION, AND MEMORY

Freyd et al. (1998) found that individuals with high dissociative tendencies appear to be at a disadvantage when selective attention is required in the

Stroop task. How would high dissociators perform under divided attention conditions? Given the definition of dissociation as a fragmentation of thoughts, feelings, and experiences, we suspected that high dissociators might actually be at a cognitive advantage in tasks where they had to divide (or fragment) their attention. Therefore, we predicted an interaction such that high DES participants might be at an advantage in a divided attention condition and at a disadvantage in a selective attention condition relative to low dissociators. To test this prediction, DePrince and Freyd (1999) designed a study to replicate and extend Freyd et al. that employed both selective and divided attention conditions. Memory was tested for words presented in both the selective and divided attention conditions of the Stroop task.

The Stroop experimental trials involved two separate blocks of trials. In the first block of trials, participants heard standard instructions to name the color of the word as quickly and accurately as possible, while ignoring the word meaning (a selective attention task). During a second block of trials, participants were instructed to attend to the word meaning as well as word color (divided attention).

In addition to presenting participants with color terms (e.g., "red" in red ink), baseline strings of x's and neutral words, we included emotionally charged words such as "incest" and "rape." Participants' task remained the same: to name the ink color. The use of emotionally charged words in the Stroop task is commonly called the "emotional Stroop." The "emotional Stroop" has been widely used to study information processing in a variety of mental disorders. In such studies participants typically view words that are emotionally charged for their particular fears (for reviews, see MacLeod, 1991; Williams, Mathews, & MacLeod, 1996). A number of studies have shown that individuals who meet criteria for PTSD take longer to name the color of words that are threatening in the emotional Stroop task than individuals without PTSD (e.g., Foa, Feske, Murdock, Kozak, & McCarthy, 1991; McKenna & Sharma, 1995; McNally, Kaspi, Riemann & Zeitlin, 1990). We added emotionally charged words in this study for two reasons: first, we were interested in seeing whether high and low dissociative individuals responded more or less slowly to the emotionally charged words, and second, we were interested in the possibility of differential recall of these words for high and low dissociators in a memory test following the Stroop task.

The study had some additional modifications from its predecessor. First, there were some methodological improvements. Stimuli were presented by computer instead of by hand-held cards and reaction times were recorded for each trial by a voice-activated microphone attached to the computer instead of by hand-held stopwatches for lists of words. In addition, filler Stroop items were included at both the beginning and end of each block of trials to absorb the anticipated primacy and recency effects for the subsequent memory tests.

Another improvement involved the addition of two individual difference measures: the Behavioral Inhibition Scale (BIS) (Carver & White, 1994) and seven questions about trauma history. The published original report of DePrince and Freyd (1999) does not include the results of the BIS and trauma questions; these results will be reported for the first time in print in the current article.

Methods for DePrince and Freyd (1999) Study

Undergraduate students at the University of Oregon were selected based on their scores on the DES (Bernstein & Putnam, 1986). Fifty-four high and 54 low DES participants were tested from an initial group of three hundred and eighty-eight students who were screened using the DES. Table 3 presents participant statistics.

Both the standard and the new dual-task Stroop color-naming tasks were employed. Participants always had the selective attention condition first, then the divided attention condition. Word order and word-color pairings were randomized for each subject. Colored word and non-word stimuli were presented on a computer screen. The experimental stimulus words came from eight categories. Word lists from six of the categories were replicated from Freyd et al. (1998). These words included baseline (strings of x's in varying lengths matched to the length of the color words), animals (e.g., cat, baboon, horse, tiger), space (e.g., star, rainbow, airplane, planet), kinship (e.g., dad, niece, brother, uncle), household (e.g., hall, cellar, television, kitchen), and incongruent colors (e.g., "red" in blue ink). For the purposes of this study, the four semantic categories were collapsed into one neutral category. Emotionally charged words were taken from McNally et al. (1998) (e.g., assault, shame, incest, victim). Finally, congruent color words were added: red, yellow, green, blue. Congruent trials included, for example, the word "red" in red ink. A practice session and final set of trials involved country names.

TABLE 3. Descriptive Statistics for the High and Low DES Group (DePrince & Freyd, 1999)

	Low DES Group	High DES Group
Number	54	54
Mean DES	5.1	29.6
Mean Age	19.6	19.5
% female	79.6%	61.1%

Each stimulus consisted of a single color word at the center of a white-colored personal computer screen. The stimulus remained on the screen until the participant made a voice response into a microphone with a 100 millisecond inter-trial interval. Word-color pairings and word order presentation were randomized for each participant. For the non-color words, half of the words were viewed during the first part of the experiment and half during the second part; list order presentation was randomized across participants.

A free recall task was administered immediately following both the selective and dual-task Stroop blocks. Participants were instructed to write down any words they could remember from the computer list just viewed. Following the free recall task, a stem completion was administered. The stem completion included 22 stems that could be completed with words viewed on the computer; five additional stems were not related to the computer list. The stem completion results are not yet reported.

Participants were tested one at a time in a room with an experimenter present. Participants were instructed that they would be presented with single words in one of four colors in the center of the computer screen, and were told that their task was to name the color as quickly and accurately as possible. They received instructions to ignore the word meanings and to name the color of the word by speaking into a microphone located directly in front of them. Participants were instructed not to correct themselves if they made errors. They engaged in a practice session, which included two blocks of eight country names. Following the practice, participants viewed the first block of words. The list concluded with the presentation of the eight country names from the practice trials. Country names appeared during practice and at the end of the list to help reduce primacy or recency effects for the experimental words in the memory tasks.

Following completion of the first block, participants were given a surprise free recall memory task. They were instructed to write down all of the words that they could remember from the list they had just seen. Next, participants were given a stem-completion task that included stems from the words seen during the Stroop task, as well as five words not viewed during the block.

Participants were given new instructions for the dual-task Stroop task. They were instructed to name the ink color as quickly and accurately as possible while also remembering the words for a memory test at the end. Practice trials using the country names were administered. Immediately following the practice trials, participants viewed a list that did not include any of the non-color words seen during the standard Stroop block. The eight country names were presented at the end of the list. Participants were again instructed to complete free recall and stem-completion tasks.

The DES (Bernstein & Putnam, 1986), the BIS (Carver & White, 1994), and a trauma questionnaire were administered by computer. The BIS is designed to

assess anxiety. It contains seven items to each of which the subject responds on a four-point scale, where a response of 1 indicates strong agreement and a response of 4 indicates strong disagreement. The items include: (1) If I think something unpleasant is going to happen I usually get pretty "worked up"; (2) I worry about making mistakes; (3) Criticism or scolding hurts me quite a bit; (4) I feel worried or upset when I think or know somebody is angry at me; (5) Even if something bad is about to happen to me, I rarely experience fear or nervousness; (6) I feel worried when I think I have done poorly at something; (7) I have very few fears compared to my friends. Items 5 and 7 are reverse scored.

One general and six more specific questions about traumatic experiences were asked. For example, participants read statements such as, "I have experienced physical abuse before age 14" and were asked to indicate yes or no. Six categories of abuse were included (sexual abuse before age 14, unwanted touching before age 14, sexual assault after age 14, physical abuse, emotional/psychological abuse, and abuse not otherwise specified).

Summary of Previously Published Results from the DePrince and Freyd (1999) Study

Table 4 includes the mean of the response times in milliseconds for six categories of words during selective and dual-task attention conditions for the high and low DES participants. Interference scores were calculated by subtracting the mean reaction times for the baseline XX category from the incongruent category for each participant. Group means were computed (see Figure 4). In a 2 (dissociation) by 2 (attention task) ANOVA, main effects for dissociation level and attention task were not significant. The crossover interaction of dissociation by attention task was significant. Among the other neutral and charged categories, no significant differences in reaction time between the groups were found.

TABLE 4. Mean (Standard Deviation) Reaction Time in Milliseconds by Condition (DePrince & Freyd, 1999)

	Selective		Dual-Task	
	Low DES	High DES	Low DES	High DES
Baseline (xxx)	669 (144)	649 (82)	784 (167)	785 (174)
Incongruent	759 (136)	778 (129)	900 (190)	878 (155)
Neutral	699 (121)	700 (101)	836 (156)	831 (151)
Charged	691 (151)	687 (103)	843 (163)	820 (178)
Congruent	605 (112)	609 (85)	735 (145)	724 (157)

FIGURE 4. Mean Interference Scores for High and Low DES by Attention Task (Selective and Dual-Task) (DePrince & Freyd, 1999)

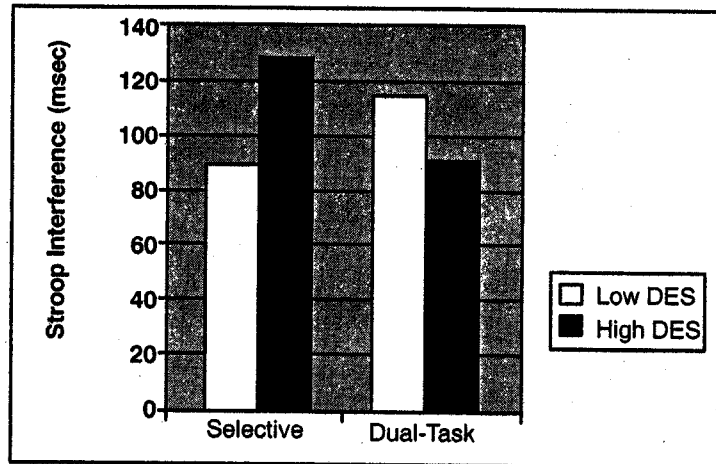
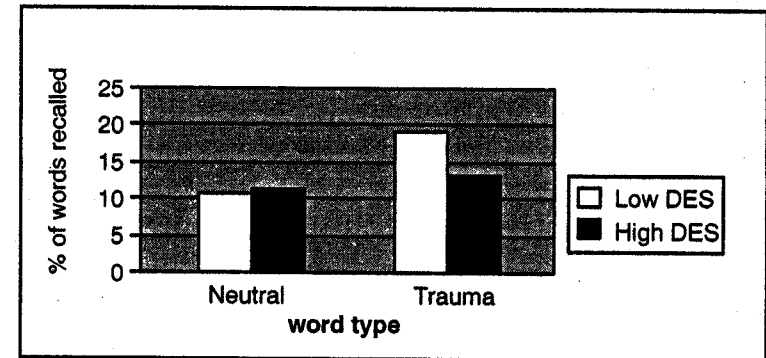


TABLE 5. Mean Percentage of Correctly Recalled Neutral and Charged Words by Condition for High and Low DES (DePrince & Freyd, 1999)

	Selective		Dual-Task	
	Neutral	Charged	Neutral	Charged
Low DES	4.18	9.73	18.05	28.70
High DES	4.40	6.95	18.13	19.45

The two groups did not differ significantly in the total number of words written (correct or not) during the free recall task. The mean percentage of words correctly recalled for neutral and emotionally charged words are presented in Table 5. Using a 2 (dissociation) \times 2 (attention task) \times 2 (word category) repeated measures mixed design ANOVA, significant effects were found for attention task and word category. The main effect of dissociation was marginally significant. A significant interaction of dissociation by word category revealed that low DES participants recalled fewer neutral words and more emotionally charged words compared to high DES participants.

FIGURE 5. Percentage of Words Recalled by Word Category (Charged or Neutral) for Low and High DES Participants (DePrince & Freyd, 1999)



New Results from the DePrince and Freyd (1999) Study

In addition to the DePrince and Freyd (1999) reported data, we now report results from the BIS and trauma questions. Scores on the BIS were computed by adding up the responses for the seven items (Items 5 and 7 reverse scored), for a possible range of 7 to 28, with higher scores representing higher anxiety. We are missing data on the BIS for one subject. Low DES participants had an average BIS score of 14.6 and high DES participants had an average BIS score of 13.9. The groups did not differ on anxiety as measured by the BIS, $t(105) = .993$; $p = .32$.

Table 6 indicates the number of "yes" responses endorsed when asked about six types of trauma: sexual abuse before age 14, uncomfortable touching, physical abuse, emotional abuse, sexual assault after age 14, and other trauma not specified. Participants could endorse more than one type of trauma. Overall we found that high DES participants reported three times as much trauma in their history as did low DES participants. The data were submitted to a logistic regression in order to test whether experiences of trauma could predict high and low dissociation groupings. Six variables were entered as predictors: sexual abuse before age 14, uncomfortable touching, physical abuse, emotional abuse, sexual assault after age 14, and other trauma not specified in the questionnaire. The model was significant ($\chi^2(6, n = 108) = 41.358, p = .0001$); the overall success rate of predictions was 70.37%.

TABLE 6. Number of "Yes" Endorsements to Traumatic Experiences in the Order Questions Were Presented to Participants by DePrince and Freyd (1999)

Type of Trauma	Low DES	High DES
Sexual Abuse (before age 14)	3	8
Uncomfortable Touching	16	22
Physical Abuse	3	9
Emotional Abuse	0	21
Sexual Assault (after age 14)	2	10
Trauma Not Specified	19	34

DIRECTED FORGETTING, ATTENTIONAL CONTEXT, AND MEMORY

We employed a directed forgetting paradigm in order to further investigate the DePrince and Freyd (1999) memory finding that high DES participants remembered fewer charged words and more neutral words relative to low DES participants. Directed forgetting is a laboratory task in which participants are presented with items and told after each item (or a group of items) whether to remember or forget the material. Subsequent memory is tested for both the "forget" and the "remember" items. We tested high and low DES participants in a directed forgetting paradigm that included both charged and neutral words, as well as both a selective and divided attention condition (DePrince & Freyd, in press). At the onset of the study, we were particularly interested in whether we would see evidence, as in DePrince and Freyd (1999), that high DES participants show impaired memory for the emotionally charged words relative to low DES participants. Additional predictions were tested and will be reported in future publication (DePrince & Freyd, in press).

Method for DePrince and Freyd, in Press

Twenty-eight high DES participants (DES score > 20; mean DES = 26.8; SD = 4.7) and 28 low DES participants (DES score < 10; mean DES = 5.19; SD = 2.8) were tested using a directed forgetting paradigm which replicated

and extended a study conducted by McNally and his colleagues (McNally et al., 1998). Participants were asked to read words that appeared on a computer screen for two seconds. Following each word, participants saw instructions to either remember or forget the word they had just read; the memory instruction appeared for three seconds. Participants were told that they would be tested on all words followed by the remember instruction at the end of the experiment. Words were drawn from three categories used in the McNally et al. (1998) study: positive, neutral and emotionally charged for sexual assault.

Participants viewed words under three different attention conditions: selective attention, divided attention with color, and divided attention with numbers. During the selective attention blocks, participants were told that they would see a word and then receive the instruction to either remember or forget that word. In the divided attention color blocks, the color of the word and instruction changed at random intervals between red and blue. In the divided attention color blocks, participants were instructed to press a key each time the color changed while also following the instructions to read and remember words. In divided attention number blocks, participants were asked to count out loud by three's while following instructions to read and remember words. We included two types of divided attention conditions to investigate how different types of divided attention task manipulations affected performance (e.g., one condition required verbal responses, another key press responses).

The stimuli were divided into three lists. Each list was paired with an attention condition and counterbalanced across participants (e.g., List A paired with the selective attention condition, List B paired with the divided attention color condition, List C paired with the divided attention number condition). Each block was repeated three times, thus participants viewed nine blocks in total. The block order was randomized for each participant. At the beginning of each block of stimuli, participants were given instructions for that particular block. Filler words appeared at the beginning and end of each block in order to prevent primacy and recency effects in free recall.

After viewing the nine blocks of stimuli, participants were asked to write down all of the words they could remember from the experiment (free recall task). Participants were instructed to write down words regardless of the remember or forget instructions presented during the experiment. Following the free recall task, participants were given a recognition test. Participants viewed words one at a time on the computer screen. Half of the words were taken from the experiment. The other half were new words, not previously viewed during the experiment, that were matched for word category (e.g., neutral, charged for sexual assault) and part of speech. Participants were instructed to make a key press for each word to indicate whether that word had been previously viewed during the experiment or was new.

Preliminary analyses of the free recall data revealed a 2 (DES, high or low) \times 2 (word category, charged or neutral) interaction within the divided attention color condition, $F(1,54) = 5.074$, $p = .028$. Within this interaction, high DES participants remembered fewer charged words and more neutral words than low DES participants who remembered more charged and fewer neutral words. Table 7 displays the mean number of words per condition.

**DISCUSSION OF SUMMARIZED RESEARCH
INVESTIGATING COGNITIVE PROCESSES
ASSOCIATED WITH DISSOCIATIVE TENDENCIES:
COGNITIVE ENVIRONMENTS TO CLINICAL IMPLICATIONS**

In summary, we found that high DES participants show more interference on the basic Stroop color-naming task than low DES participants (Freyd et al., 1998; DePrince & Freyd, 1999). In contrast, we found an interaction between DES and attention condition such that the high DES group exhibited less interference when they were asked to divide their attention and accomplish two tasks at once (DePrince & Freyd, 1999). We also found that the high DES group remembered fewer emotionally charged words than the low DES group overall (DePrince & Freyd, 1999), as well as in a divided attention condition (DePrince & Freyd, in press), findings suggestive of the adaptive value of dissociation.

Furthermore, we found, in line with other studies, that individuals with high DES scores report significantly more trauma in their histories (DePrince & Freyd, 1999, study; data reported here). The self-reported trauma histories are limited in that they were not corroborated, and there is some reason to be concerned that highly dissociative people may be more inclined to confabulate (e.g., see Hyman & Billings, 1998). However, it seems likely that the substantially higher rates of reported trauma for the high DES participants has some basis in real traumatic exposure, given the evidence that retrospec-

TABLE 7. Mean Number of Words (std. dev.) Recalled in the Divided Attention Color Condition of the Directed Forgetting Experiment (DePrince & Freyd, in preparation).

	Charged	Neutral
Low DES (n = 28)	.93 (.81)	.50 (.75)
High DES (n = 28)	.54 (.74)	.75 (.93)

tive reports of early childhood events are reasonably reliable (Brewin, Andrews & Gotlib, 1993) and the evidence that dissociation is found to be higher in populations with corroborated trauma histories (e.g., Bremner et al., 1992; Carlson & Rosser-Hogan, 1993; Marmar et al., 1994; Putnam & Trickett, 1997).

The current findings suggest that dissociative tendencies and basic cognitive processes of memory and attention are interconnected. The cross-over interaction for Stroop interference suggests that, at least for some tasks requiring the selection of information, dissociative people may perform better when dual-tasking, as compared with non-dissociative people who may perform best when focusing their attention. As a corollary, this finding suggests that although highly dissociative individuals are generally considered impaired, in some contexts they may have a cognitive edge. The interaction between word-category and DES group that we found with the free recall data hints that this dissociation may be adaptive in keeping emotionally charged information out of consciousness (DePrince & Freyd, 1999). The interaction between word-category and DES in the divided attention condition of the directed forgetting study suggests that divided attention conditions may aid high DES participants in keeping threatening stimuli from awareness (DePrince & Freyd, in press).

We currently understand these results as consistent with a "cognitive environments" conceptualization for dissociation. This conceptualization assumes that individuals who are high dissociators have developed ways to cope in life that allow for their dissociation without apparent problems under many circumstances. This lack of integration of experiences, memories, and thoughts creates an environment that requires constant divided attention. Individuals who habitually dissociate information may come to be best able to function in multi-tasking, divided attention, divided control structure environments. Individuals who do not habitually dissociate may be best able to function in relatively more focused attention, task, and control environments.

From a "cognitive environments" viewpoint, traumatized individuals may use dissociation and dual-tasking in order to keep information that is potentially at odds with survival goals away from consciousness and other mental functions. Habitual creation of a divided cognitive environment may lead to both adaptive and maladaptive consequences, depending on the context and functional demands of the situation. In order to make a more concrete connection between the current findings and trauma history, an important replication should include a sample with corroborated trauma histories. In addition, studies that manipulate dissociation will be important in determining whether attentional differences are related to state or trait dissociation.

Finally, we offer the following speculation for future consideration: If some individuals are better able to function under conditions of divided attention, they may take actions to increase the extent of "chaos" in their

environment. If so, some of the commonly reported chaos in the lives of clients who are highly dissociative (e.g., trauma survivors, individuals diagnosed with dissociative disorders or PTSD) may be understood as serving a particular cognitive function. If chaos serves a cognitive function, such as creating and maintaining divided cognitive environments, understanding this function may aid clinicians in their therapeutic approaches.

Future Research

The question of causality remains to be addressed. Does trauma lead to dissociative coping strategies which in turn cause changes in attentional mechanisms (and thus memory encoding)? Do these changes in mechanisms, in turn, lead to chronically high levels of dissociation? Longitudinal studies with victims who have corroborated their traumatic experiences would be particularly valuable in addressing this issue (although a challenge here is that corroborated trauma victims are not representative of the majority of incest victims, in which the very dynamics that make corroboration unlikely may make dissociation functional in that family context).

Research questions also rise out of the potential clinical applications of these findings. If dissociative tendencies have implications for basic cognitive mechanisms, then perhaps clinical interventions should take this into consideration. How permanent are attentional changes? Does attentional performance change as an individual becomes more or less dissociative over time? Future studies may attempt to manipulate dissociative level within an individual to see the extent to which attentional function varies.

If additional research replicates and expands upon our findings, this research will have clinical implications. While high dissociators do sometimes make chaos in their lives, they may have certain cognitive "deficits" and "strengths" depending on the task context. Clinicians might help dissociators find appropriate contexts for their particular skills. Clinicians may be more helpful if they understand cognitive and adaptive forces behind the chaos, and should remain alert to the possibility that certain dissociative responses continue to have some current adaptive value to patients.

CONCLUDING REMARKS

In this article we have summarized both our perspective on memory for trauma and the findings from three studies we have conducted investigating the cognitive processes associated with dissociative tendencies. The theoretical perspective of betrayal trauma theory and our observations and readings about the phenomenology of trauma and traumatic stress have provided us with a framework for generating hypotheses. The conceptual and method-

ological tools of cognitive science have provided us with a framework for testing these hypotheses. The result has been the discovery of some of the ways that attention and memory differ between high dissociators (who we have reason to believe are on average highly traumatized) and low dissociators (who we have reason to believe are on average less traumatized). This research is fundamentally in its infancy, yet there are already clinical implications inherent in the conceptualization and findings. We eagerly look forward to continuing to pursue research in this promising area; so much remains to be uncovered about the deeply important question of human response to trauma.

REFERENCES

- Anderson, M. C. (2000). Active forgetting: Evidence for functional inhibition as a source of memory failure. *Journal of Aggression, Maltreatment & Trauma* (This volume).
- Arrigo, J. M., & Pezdek, K. (1998). Lessons from the study of psychogenic amnesia. *Current Directions in Psychological Science*, 6, 148-152.
- Beckett, K. (1996). Culture and the politics of signification: The case of child sexual abuse. *Social Problems*, 43(1), 57-76.
- Bernstein, E. M., & Putnam, F. W. (1986). Development, reliability, and validity of a dissociation scale. *Journal of Nervous and Mental Disease*, 174, 727-735.
- Bowman, C. G., & Mertz, E. (1996). What should the courts do about memories of sexual abuse? Towards a balanced approach. *The Judge's Journal*, 35(4), 7-17.
- Bremner, J. D., Southwick, S., Brett, E., Fontana, A., Rosenheck, R., & Charney, D. (1992). Dissociation and posttraumatic stress disorder in Vietnam combat veterans. *American Journal of Psychiatry*, 149:3, 328-332.
- Brewin, C. R. (1996). Clinical and experimental approaches to understanding repression. In J. D. Read & D. S. Lindsay (Eds.), *Recollections of trauma: Scientific research and clinical practice* (pp 145-163). New York: Plenum Press.
- Brewin, C. R., & Andrews, B. (2000) Questions and answers about traumatic memory. *Journal of Aggression, Maltreatment & Trauma*. (This volume).
- Brewin, C. R., Andrews, B., & Gotlib, I.H. (1993). Psychopathology and early experience: A reappraisal of retrospective reports. *Psychological Bulletin*, 113, 82-98.
- Briere, J. (1997). *Psychological assessment of adult posttraumatic stress*. Washington, DC: American Psychological Association.
- Butler, K. (1996). The latest on recovered memory. *Family Therapy Networker*, 20(6), 36-37.
- Carlson, E. B., & Putnam, F. W. (1993). An update on the Dissociative Experiences Scale. *Dissociation*, VI, 16-27.
- Carlson, E. B., & Rosser-Hogan, R. (1993). Trauma experiences, posttraumatic stress, dissociation and depression in Cambodian refugees. *American Journal of Psychiatry*, 148, 1548-1551.
- Carver, C. S., & White, T. L. (1994). Behavioral inhibition, behavioral activation, and affective responses to impending reward and punishment: The BIS/BAS scales. *Journal of Personality and Social Psychology*, 67, 319-333.

- Cheit, R. E. (1998). Consider this, skeptics of recovered memory. *Ethics & Behavior*, 8, 141-160.
- Corwin, D. L., & Olafson, E. (1997). Videotaped discovery of a reportedly unrecalable memory of child sexual abuse: Comparison with a childhood interview videotaped 11 years before. *Child Maltreatment*, 2, 91-112.
- Dalenberg, C. J. (1996). Accuracy, timing and circumstances of disclosure in therapy of recovered and continuous memories of abuse. *Journal of Psychiatry and Law*, 24, 229-275.
- DePrince, A. P., & Freyd, J. J. (in press). Dissociation and directed forgetting under conditions of divided attention. *Journal of Trauma & Dissociation*.
- DePrince, A. P., & Freyd, J. J. (1997). So what's the dispute about? *The Judges' Journal: A Quarterly of the Judicial Division of the American Bar Association*, 36(3), 70-72.
- DePrince, A. P., & Freyd, J. J. (1999). Dissociative tendencies, attention, and memory. *Psychological Science*, 10, 449-452.
- Eich, E., Macaulay, D., Lowenstein, R. J., & Dibley, P. H. (1997). Memory, amnesia, and dissociative identity disorder. *Psychological Science*, 8, 417-422.
- Elliott, D. M. (1997). Traumatic events: Prevalence and delayed recall in the general population. *Journal of Consulting and Clinical Practice*, 65, 811-820.
- Elliott, D. M., & Briere, J. (1995). Posttraumatic stress associated with delayed recall of sexual abuse: A general population study. *Journal of Traumatic Stress*, 8, 629-648.
- Enns, C. Z., C. McNeilly, J. Corkery, and M. Gilbert. (1995). The debate about delayed memories of child sexual abuse: A feminist perspective. *The Counseling Psychologist*, 23, 181-279.
- Fitzpatrick, F. L. (1994). Isolation and silence: A male survivor speaks out about clergy abuse. *Moving Forward*, 3(1), 4-8.
- Foa, E., Feske, U., Murdock, T., Kozak, M., & McCarthy, P. (1991). Processing of threat-related information in rape victims. *Journal of Abnormal Psychology*, 100, 156-162.
- Freyd, J. J. (in press) Memory for trauma: Separating the contributions of fear from betrayal. In J.R. Conte (Ed) *Child Sexual Abuse: Knowns and Unknowns—A Volume in Honor of Roland Summit*. Thousand Oaks, CA: Sage Publications.
- Freyd, J. J. (1994). Betrayal trauma: Traumatic amnesia as an adaptive response to childhood abuse. *Ethics & Behavior* 4, 207-309.
- Freyd, J. J. (1998) Science in the memory debate. *Ethics & Behavior*, 8, 101-113.
- Freyd, J. J., Martorello, S.R., Alvarado, J.S., Hayes, A. E., & Christman, J.C. (1998). Cognitive environments and dissociative tendencies: Performance on the standard Stroop task for high versus low dissociators. *Applied Cognitive Psychology*, 12, S91-S103.
- Freyd, J. J. (1996). *Betrayal trauma theory: The logic of forgetting childhood abuse*. Cambridge, MA: Harvard University Press.
- Gleaves, D. H. (1996). The evidence for "repression": An examination of Holmes (1990) and the implications for the recovered memory controversy. *Journal of Child Sexual Abuse*, 5, 1-19.

- Gleaves, D. H., & Freyd, J. J. (1997). Questioning additional claims about the "false memory syndrome" epidemic. *American Psychologist*, 52, 993-994.
- Goleman, D. (1992, July 21). Childhood trauma: Memory or invention? *The New York Times*, p. B5-B8.
- Herman, J. L. (1992). *Trauma and Recovery*. New York: Basic Books.
- Hilgard, E. R. (1986). *Divided consciousness: Multiple controls in human thought and action*. New York: John Wiley & Sons.
- Hyman, I. E., Jr., & Billings, F. J. (1998) Individual difference and the creation of false childhood memories. *Memory*, 6, 1-20.
- Kardiner, A. (1941). *The Traumatic Neuroses of War*. New York: Hoeber.
- Kihlstrom, J. F., & Couture, L. J. (1992). Awareness and information processing in general anesthesia. *Journal of Psychopharmacology*, 6, 410-417.
- Koopman, C., Classen, C., & Spiegel, D. (1994). Predictors of posttraumatic stress symptoms among survivors of the Oakland/Berkeley, Calif., firestorm. *American Journal of Psychiatry*, 151, 888-894.
- Litz, B. T., Weathers, F. W., Monaco, V., Herman, D. S., Wulfsohn, M., Marx, B., & Keane, T. M. (1996). Attention, arousal, and memory in posttraumatic stress disorder. *Journal of Traumatic Stress*, 9, 497-520.
- Loftus, E. F. (1993). The reality of repressed memories. *American Psychologist*, 48, 518-537.
- Loftus, E. K., & Ketcham, K. (1994). *The myth of repressed memory: False memories and allegations of sexual abuse*. New York: St. Martin's Press.
- Loftus, E. F., Polonsky, S., & Fullilove, M. T. (1994) Memories of childhood sexual abuse: Remembering and repressing. *Psychology of Women Quarterly*, 18, 67-84.
- MacLeod, C. M. (1991). Half a century of research on the Stroop Effect: An integrative review. *Psychological Bulletin*, 109, 163-203.
- Marmar, C. R., Weiss, D. S., Schlenger, W. E., Fairbank, J. A., Jordan, B. K., Kulka, R. A., & Hough, R. L. (1994). Peritraumatic dissociation and posttraumatic stress in male Vietnam theater veterans. *American Journal of Psychiatry*, 151, 902-907.
- McFarlane, A., & van der Kolk, B. A. (1996) Conclusions and future directions. In B. A. van der Kolk, A. McFarlane, & L. Weisaeth (Eds.), *Traumatic Stress: The effects of overwhelming experience on mind, body, and society*. (pp. 559-575) New York: Guilford Press.
- McKenna, F. P., & Sharma, D. (1995). Intrusive cognitions: An investigation of the emotional Stroop task. *Journal of Experimental Psychology: Learning, Memory and Cognition*, 21, 1595-1607.
- McNally, R., Kaspi, S., Riemann, B. & Zeitlin, S. (1990). Selective processing of threat cues in post-traumatic stress disorder. *Journal of Abnormal Psychology*, 99, 398-402.
- McNally, R. J., Metzger, L. J., Lasko, N. B., Clancy, S. A., & Pitman, R. K. (1998). Directed forgetting of trauma cues in adult survivors of childhood sexual abuse with and without posttraumatic stress disorder. *Journal of Abnormal Psychology*, 107, 596-601.
- Morton, J. (1994) Cognitive perspectives on memory recovery. *Applied Cognitive Psychology*, 8, 389-398.

- Myers, C. S. (1940) *Shell shock in France 1914-18*. Cambridge, England: Cambridge University Press.
- Nissen, M. J., Ross, J. L., Willingham, D. B., MacKenzie, T. B., & Schacter, D. L. (1988). Memory and awareness in a patient with multiple personality disorder. *Brain and Cognition*, 8, 117-134.
- Oakes, M. A., Hyman, I. (2000) The role of the self in false memory creation. *Journal of Aggression, Maltreatment & Trauma*. (This volume).
- Pezdek, K. (2000) A cognitive analysis of the role of suggestibility in explaining memories for abuse. *Journal of Aggression, Maltreatment & Trauma*. (This volume).
- Pope, K. S. (1996). Memory, abuse, and science: Questioning claims about the false memory syndrome epidemic. *American Psychologist*, 51, 957-974.
- Pope, K. S. (1997) Science as careful questioning: Are claims of a false memory syndrome epidemic based on empirical evidence? *American Psychologist*, 52, 997-1006.
- Pope, K. S., & Brown, L. S. (1996). *Recovered memories of abuse: Assessment, therapy, forensics*. Washington, DC: American Psychological Association.
- Putnam, F. W. & Trickett, P. K. (1997). The psychobiological effects of sexual abuse: A longitudinal study. *Annals of the New York Academy Science*, 821, 150-159.
- Sargent, W. & Slater, F. (1941). Amnesic syndromes in war. *Proceedings of the Royal Society of Medicine*, 34, 757-764.
- Saxe, G. N., van der Kolk, B. A., Berkowitz, R., Chinman, G., Hall, K., Lieberg, G., & Schwartz, J. (1993). Dissociative disorders in psychiatric inpatients. *American Journal of Psychiatry*, 150, 1037-1042.
- Schachter, D. L. (1996). *Searching for memory: The brain, the mind, and the past*. New York: Basic Books.
- Schacter, D. L., Kihlstrom, J. F., & Kihlstrom, L. C. (1989). Autobiographical memory in a case of multiple personality disorder. *Journal of Abnormal Psychology*, 98, 508-514.
- Schefflin, A. W. & Brown, D. (1996). Repressed memory or dissociative amnesia: What the science says. *The Journal of Psychiatry & Law*, 24, 143-188.
- Schooler, J. W. (2000) Discovering memories of abuse in the light of meta-awareness. *Journal of Aggression, Maltreatment & Trauma*. (This volume).
- Schooler, J. W., Bendixen, M., & Ambadar, Z. (1997). Taking the middle line: Can we accommodate both fabricated and recovered memories of sexual abuse? In M.A. Conway (Ed.) *Recovered Memories and False Memories*. (pp. 251-291) Oxford: Oxford University Press.
- Shay, J. (1994). *Achilles in Vietnam: Combat trauma and the undoing of character*. New York: Atheneum.
- Spiegel, D. (1997) Trauma, dissociation, and memory. In R. Yehuda & A. McFarlane (Eds), *Psychobiology of Posttraumatic Stress Disorder* (pp 225-237). New York: The New York Academy of Sciences.
- Stanton, M. (1997, July-August). U-turn on memory lane. *Columbia Journalism Review*, 44-49.
- Stroop, J. R. (1935). Studies of interference in serial verbal reactions. *Journal of Experimental Psychology*, 18, 643-662.

- van der Kolk, B. A. (1987). *Psychological trauma*. Washington, D.C.: American Psychiatric Press.
- Williams, J. M. G., Mathews, A., & MacLeod, C. (1996). The emotional Stroop task and psychopathology. *Psychological Bulletin*, 120, 3-24.
- Williams, L. M. (1994). Recall of childhood trauma: A prospective study of women's memories of child sexual abuse. *Journal of Consulting and Clinical Psychology*, 62, 1167-1176.
- Williams, L. M. (1995). Recovered memories of abuse in women with documented child sexual victimization histories. *Journal of Traumatic Stress*, 8, 649-674.