

DELAYED MEMORIES OF
CHILD ABUSE: PART I:
AN OVERVIEW OF
RESEARCH FINDINGS
ON FORGETTING,
REMEMBERING, AND
CORROBORATING TRAUMA

Elizabeth S. Bowman, M.D.

Elizabeth S. Bowman, M.D., is Associate Professor of Psychiatry at the Indiana University School of Medicine in Indianapolis, Indiana.

For reprints write Elizabeth S. Bowman, M.D., 541 Clinical Drive, Room 291, Indianapolis, IN 46202

The author thanks Philip M. Coons, M.D., for review and helpful suggestions regarding this work.

ABSTRACT

This article provides an overview of data from memory research which is clinically relevant to dealing with delayed memories of abuse in dissociative disorder patients. Studies indicate that childhood abuse is partly or completely forgotten by 12%-64% of adults. Amnesia has been consistently associated with earlier abuse, threats, and more types of abuse. Therapy is a factor in memory return in about half of persons, and is the sole trigger in one fourth of cases. Corroboration of delayed memories of child abuse has been found in 47%-74% of outpatients reporting abuse in 85%-94% of dissociative disorder patients, and in 0%-3% of persons reporting ritual abuse. Studies suggest that extreme emotional arousal diminishes recall, but moderate arousal results in accurate enhanced recall of central events. Memories of real life trauma have low suggestibility, throwing doubt on the applicability of laboratory studies of eyewitness memory suggestibility to trauma memories. Implications for therapy are discussed.

INTRODUCTION

Observations of repression of memory form one of the foundations of psychoanalytic and psychodynamic theories. In the recent debate over the validity of delayed memories of childhood abuse (memories which were unavailable and were later recalled), the concept of repression has been challenged. Although data to disprove the existence of repression of trauma do not exist, critics have questioned whether people can completely "forget" memories of abuse. The term "robust repression" was recently coined to describe complete or near-complete loss of childhood abuse memories (Ofshe & Singer, unpublished manuscript cited by Loftus, Polonsky, & Fullilove, 1994). Although this term has no history in

clinical or research literature, in the United States, "robust repression" is currently being attacked as a fallacious concept held by clinicians who treat abused persons.

One of the misfortunes of the delayed abuse memory debate has been a focus on impassioned rhetoric rather than impartial examination of research on memory and abuse. While this debate has graced us with some comprehensive overviews of memory from the disciplines of cognitive psychology (Lindsay & Read, 1994), experimental child psychology (Ceci & Bruck, 1993), and experimental adult psychology (Loftus, 1993), such reviews have generally reflected the viewpoints of non-clinician experimentalists. With few exceptions (Koss, Tromp, & Tharan, 1995; Van der Hart & Nijenhuis, 1995), memory data from traumatized persons or dissociative disorder patients have been remarkably absent in such reviews.

The purpose of this article and the accompanying companion paper is to acquaint clinicians with research findings which are relevant to dealing with delayed memories of abuse in dissociative disorder patients. This paper addresses studies of memory loss and recall in traumatized persons. Studies of memory reliability and suggestibility which are relevant to working with dissociative disorders are found in a companion article (Bowman, 1996b). This is not a comprehensive overview of memory literature, but a clinician's guide to the major clinically relevant findings. I will approach this overview by citing research data that answer a series of questions that have arisen in the delayed memory debate, beginning with data relevant to the assertion that people rarely completely forget trauma or abuse.

DOES AMNESIA EXIST FOR TRAUMAS OTHER THAN CHILD ABUSE?

Critics of delayed memories of child abuse have charged that people rarely forget trauma, so such memories must be the result of misguided therapeutic persuasion. If this charge is true, evidence of amnesia for severe trauma, child abuse included, should be lacking. However, documentation of amnesia in response to extreme emotional arousal has long existed. Van der Hart and Nijenhuis (1995) describe Janet's (1904) report of amnesia in response to bereavement. Since World War II, many studies have documented amnesia for

TABLE 1
How Often Do People Report Forgetting Childhood Abuse?

| Study | Forgot Some of the Abuse | Severe Amnesia |
|---|-----------------------------------|------------------------|
| Herman & Schatzow, 1987 <i>53 women incest group outpatients</i> | 64% (Ever) | 28% |
| Briere & Conte, 1993 <i>450 adult outpatients</i> | 59% (Before age 18) | 59% (Before age 18) |
| Feldman-Summers & Pope, 1994 <i>330 psychologists</i> | 40% (Ever) | |
| Loftus, Polonsky, & Fullilove, 1994 <i>105 women substance abuse outpatients</i> | 31% (Ever) | 19% |
| Williams, 1994a <i>129 community women, with documented child abuse</i> | 48% (Ever) 38% (Current) | ≥12% |
| Albach, 1993, 1995 <i>100 women abuse group outpatients</i> | 59% | 29% |

combat (e.g., Fisher, 1944; Archibald & Tuddenham, 1965; Bremner, Steinberg, & Southwick, 1993). Other reports have established the existence of total or near total amnesia for crimes (Senguta, Jena, & Shekhar, 1993; Coons, 1992), concentration camp experiences (Jaffe, 1968), and torture (Goldfield, Mollica, & Pesavento, 1988). Certainly, reports of traumatic amnesia are not confined to adults reporting child abuse or to persons in therapy in recent years.

HOW OFTEN, IF AT ALL, DO PEOPLE REPORT FORGETTING CHILD ABUSE?

Numerous studies have addressed reports of forgetting childhood abuse (Coons et al., in press). Table 1 shows some of the larger studies that addressed how often adults report partial or complete amnesia for childhood abuse. Each study has found that a significant proportion of adults who report

childhood abuse also report periods of being unable to recall some or all of their abuse.

Herman and Schatzow's (1987) subjects were mostly Caucasian, employed, currently unmarried American women who were studied while they took part in time-limited outpatient groups for incest survivors. All subjects had reported that they had been or strongly suspected they had been sexually abused by a relative. The authors studied memory return, corroboration of memories, and factors associated with the severity of amnesia. This study is limited by the inclusion of persons without any abuse memories in a group where the content of emerging memories might be affected by the accounts of other group members.

Briere and Conte (1993) studied American adult outpatients by distributing a questionnaire to clinicians with an interest in treating childhood abuse. Subjects were 90% Caucasian, 93% female, and all reported that before age sixteen, they experienced forced or coerced sexual contact with a person five or more years older. Subjects were asked if there was a time before age 18 when they were unable to remember the forced sexual experience. This study does not distinguish clearly between partial and complete amnesia for all episodes of childhood abuse. This sample is potentially biased toward more severely abused persons

who might seek therapists experienced in treating child abuse.

Feldman-Summers and Pope (1994) mailed questionnaires to a national sample of American psychologists, asking them about personal memories of sexual and nonsexual abuse before age eighteen. Those reporting abuse experiences were asked if there was ever a period of time when they could not remember some or all of the abuse. Male respondents (44% of the sample) did not differ from females in likelihood of having forgotten abuse. This study did not clearly distinguish partial from complete forgetting of abuse, but does indicate that reports of forgetting abuse are not confined to women.

Loftus, Polonsky, & Fullilove (1994) provide data on American women substance abuse outpatients who were mostly unmarried and African-American (80%) or Hispanic (16%). During an individual interview, subjects were asked

about sexual contact before age 19 with a person at least five years older. Those who reported abuse were asked if they always remembered all of it (69%), always remembered some of it but had forgotten part of it (12%), or at one time had forgotten it and had the memory return (19%). A combination of the latter two categories indicates that 31% were aware of at least some forgetting of their abuse. This study included considerable detail about abuse experiences and information on the clarity and emotional valence of memories currently and when they first returned.

Williams' (1994a) study of a community sample of inner city mostly African-American women is the only prospective study of memories of child abuse. Her subjects had a documented childhood report of abuse that resulted in an emergency room visit approximately 17 years earlier. Subjects abused at age three or younger accounted for 8.5% of the subjects, so some subjects would not be expected to remember their abuse. When contacted for follow up, subjects were interviewed in depth about trauma by interviewers blind to each subject's particular assault history. Subjects were also blind to the purpose of the study. In addition to the 38% of subjects who currently were unable to recall the index episode of abuse or other episodes of abuse by the same perpetrator, another 10% reported having forgotten the abuse in the past. Twelve percent of subjects denied any abuse, but their age range during the abuse is not specified. It is not clear if some of the subjects who recovered abuse memories had previously forgotten all their abuse.

This study's stringent methodology provides the strongest evidence yet of the existence of forgetting child abuse. Since this was a community sample rather than a clinical one, the return of memories is not likely related to suggestions made in therapy.

In 1987, Albach (1993, 1995) studied abuse memories in 100 Dutch women who attended groups for abuse victims. Comparison subjects (65 women without abuse recollections from the Netherlands' general population) were asked about recall of an unpleasant childhood memory in order to control for simple deterioration of childhood memories over time. Significantly more sexual abuse subjects than comparison ones were still amnesic for part of the target memory (59% vs 24%) or had once lost the entire memory (29% vs 1%). Complete memory loss was a mean of 15 years in duration. Albach's work provides evidence that loss of abuse memories occurs outside of the United States, and in similar proportions to American subjects. Her clinical sample and her results are very similar to Herman and Schatzow's.

In addition to the studies in Table 2, van der Kolk and Fisler (1995) reported that 42% of 36 adults with childhood trauma reported either partial or complete amnesia for the trauma. Corroboration of the trauma was available in three-fourths of subjects. Coons et al. (in press) compared reports of partial or complete amnesia for trauma in 25 patients with affective disorders and 50 with dissociative disorders. At least

partial amnesia was reported by 24% of affective disorder and 96% of dissociative disorder subjects. Among the latter group, some amnesia for childhood abuse was reported by more than half of subjects.

Despite great differences in methodology and subject selection, these seven studies provide evidence that documented or reported child abuse is not recalled by a significant proportion of its victims. Taken together, these studies suggest that approximately one-third to two-thirds of abused persons at some time cannot recall some of their abuse and one-eighth to one-fourth have periods of complete unawareness of their abuse. Forgetting abuse is not confined to women, to low functioning persons, to North Americans, or to persons in treatment.

The above studies do not explicate the mechanisms by which child abuse memories become unavailable. Ignoring dissociation, Loftus, Garry, and Feldman (1994) have suggested that simple forgetting rather than repression could account for unavailable memories of abuse. Williams (1994b) disagrees, citing factors (such as amnesia being associated with abuse by someone with whom the child had a close relationship) that point to defensive mechanisms such as cognitive avoidance, dissociation or repression being responsible for unavailable memories. Similarly, van der Hart and Nijenhuis (1995) believe that dissociative disintegration of the personality explains loss of memory for traumas.

ARE ANY FACTORS ASSOCIATED WITH FORGETTING CHILD ABUSE?

Critics of delayed memories of child abuse charge that such memory reports are the result of zealous therapists encouraging patients to produce these memories as the price of becoming well. If this charge is accurate, it would predict little consistency in factors associated with reports of delayed abuse memories, except for the factor of participation in a psychotherapy that addresses child abuse. Do research studies support this?

Six studies provide data on factors associated with reports of being unable to remember child abuse experiences. Feldman-Summers and Pope (1994) found no difference in the likelihood of forgetting physical or sexual abuse by relatives or sexual abuse by non-relatives. However, forgetting abuse was significantly more likely in persons reporting more than one type of abuse than in those with only one type of abuse (40.5% vs 6.3%, $p < .0001$).

Briere and Conte (1993) found that persons with a history of amnesia for abuse were significantly more likely than those without amnesia to report being younger at the onset of abuse (mean 5.8 vs. 7.2 years), report longer abuse (11.4 vs. 9.2 years), report more abusers (2.45 vs. 2.10 abusers), have been injured by the abuse, to think they would die if they told about the abuse, and to have more current psychological symptoms. Herman and Schatzow (1987) also

TABLE 2
Factors Associated with Forgetting Abuse: Conclusions From Six Studies

| Abuse Factors | Number of Studies | |
|--------------------------|-------------------|----------------|
| | Associated | Not Associated |
| Younger age at onset | 4 | 0 |
| Threats/intense emotions | 2 | 0 |
| More types of abuse | 2 | 0 |
| More abusers | 2 | 1 |
| Violent/injurious | 2 | 2 |
| Longer/more frequent | 2 | 3 |
| Incest or sexual abuse | 1 | 2 |

found that an earlier onset of abuse predicted more severe amnesia. Their subjects with no amnesia, mild to moderate amnesia and severe amnesia reported abuse onset at mean ages of 10.6, 8.2 and 4.9 years, respectively. However, unlike Briere and Conte, these authors found that a shorter duration of abuse correlated with amnesia (2.5 years for severe amnesia vs. 5.9 years for no amnesia). Herman and Schatzow's methodology leaves open the possibility that the entire duration of abuse was still not recalled by their subjects. Of importance to clinicians, they concluded that abuse beginning in or continuing into adolescence was never completely forgotten, but violent or sadistic abuse was more likely forgotten.

Loftus et al. (1994) reported the opposite – that violent or incestuous abuse was not associated with amnesia; however their definition of violent abuse is considerably milder than that of other researchers. They also found that amnesia for abuse is *not* associated with the number of abusers, frequency of abuse or how intensely adults currently feel about the abuse. Their findings do support the defensive nature of amnesia for child abuse, linking it with more intense feelings at the time of the abuse, less intense adulthood feelings associated with the abuse memory, and less clear current memories of abuse. They report that amnesia is associated with fewer total abuse memories. It is not clear if this is due to less abuse or the presence of undetected amnesia for other abuse experiences.

Williams (1994a) used stricter definitions of violent abuse than Loftus but also found that neither violent abuse nor repeated abuse were correlated with amnesia for abuse. Unlike Feldman-Summers and Pope, she found that abuse

by family members was more likely to be forgotten. Like others, Williams found that rates of amnesia were highest when the target incident of abuse was earlier (55% for below age 4; 62% for ages 4-6; 31% for ages 7-10; 26% for ages 11-12). One unpublished American study (Goodman, Qin, Bottoms, & Shaver, 1994) of persons reporting ritual or religion-related child abuse to psychologists also found that subjects with a history of amnesia for the abuse reported earlier abuse onset than did those without amnesia (mean 2.8, $N = 43$ vs. 7.3 years, $N = 447$). These authors also found that amnesia was associated with reports of more violent abuse, more perpetrators and more types of abuse.

Table 2 contains a summary of the above findings. The research literature agrees on the association of amnesia with three of the seven factors that were cited in at least two studies. The strongest finding is the association of amnesia with earlier abuse, especially for onset before age seven. Contradictory findings on other factors may be related to differences in study methodologies and subject populations. At the very least, they indicate that research is needed to improve our understanding of amnesia associated with child abuse.

IS THE RETURN OF DELAYED ABUSE MEMORIES SOLELY DUE TO PSYCHOTHERAPY?

If all recollection of previously forgotten abuse occurs solely during psychotherapy sessions or during the life period encompassed by participation in psychotherapy, then we would be correct in suspecting that such memories might be iatrogenic in origin and of suspect historical veracity. Does research support the charge that memories return solely because of suggestive therapies?

In 90% of Feldman-Summers and Pope's (1994) subjects, at least one event was reported as triggering memory return. Being involved in psychotherapy was the most frequently reported trigger, yet this factor was absent in 44% of subjects. Only one fourth of subjects reported that psychotherapy was the sole trigger for recollection. Eighteen percent were reminded of it by someone else who knew about the abuse. This study found a wide variety of triggers for memory return and did not support the charge that returned memories of abuse are solely the creation of psychotherapists.

Albach (1993, 1995) also found that return of incest memories was brought about by a variety of events, including television programs about incest, the death of the perpetrator, the abuse of the subject's own child, and seeing the site of the abuse. She noted that psychotherapy appeared to play a minor role in the return of abuse memories.

An elegantly designed study by Dalenberg (1996) reports on 17 women who entered therapy with some continuous memories of child abuse and recovered additional memories of abuse. All had accused their fathers of abuse. Each patient's therapy was audiotaped and analyzed for details of memories. All patients and their fathers agreed to search for

evidence relating to the accuracy of abuse memories. Evidence was judged against the memory details from therapy tapes and each detail was given an evidentiary rating of 1 (evidence alone is convincing) to 5 (evidence against father being the abuser) by a panel of eight judges from a spectrum of attitudes toward recovered memories. Evidence was considered corroborating if six judges gave it an evidentiary rating of 1 or 2.

Dalenberg found that 34% of all abuse episodes were recovered in therapy sessions. Triggers for memory return were identified from therapy transcripts. No trigger for memory recovery was identified for 10% of memories. A trigger external to therapy was identified in 47%, and included media/movies, interpersonal and traumatic events, and books. Triggers in therapy were identified in 42% of memories and were commonly general associations and positive and negative affects. Corroborated memories were significantly more likely to be recalled later in the course of therapy.

In the Coons et al. (in press) study of affective and dissociative disorder (DD) subjects, a variety of triggers for memory return were reported by both groups. Among the DD group, half reported memory return prior to entering therapy. Of those engaged in psychotherapy, half reported memory return outside of sessions.

These four studies support the conclusion that the majority of memories of abuse are recovered outside of therapy sessions and occur in response to a variety of triggers that do not involve an intervention by a therapist (i.e., traumatic and interpersonal events and media reports). However, these studies do not address the effect of suggestive and non-suggestive therapeutic techniques on memory return.

IS THERE CORROBORATION FOR RETURNED MEMORIES OF ABUSE?

Corroboration is the only certain way to reliably assess the accuracy of returned memories of abuse. Thus, corroboration is critical in assessing if recovered memories should be viewed as potentially reliable. This is a particularly acute issue for dissociative disorder patients who, by the nature of their illness, have high rates of amnesia. Corroboration of abuse memories has been studied in four general populations of abuse survivors, three dissociative disorder populations, and four ritual abuse populations.

Among Herman & Schatzow's (1987) subjects (a mixture of persons with delayed and never forgotten abuse memories), 89% attempted to corroborate their memories. Six percent were unable to find corroboration, leaving 74% of the entire sample with corroboration. Corroborating evidence was obtained from the perpetrator, other family members or physical evidence in 40%, while 34% found another child or sibling who reported abuse by the same perpetrator. Among Feldman-Summers & Pope's (1994) sub-

jects who had once forgotten their abuse, 47% reported some corroboration of abuse. It is not clear what percent sought corroboration. More than one type of corroboration was found by fifteen percent. Corroboration came from someone who knew about the abuse (22%), from the abuser acknowledging it (15%), from someone else abused by the same abuser (15%), and from medical records or old diaries (12%). Of critical importance, memories whose return was triggered by psychotherapy were as likely to be corroborated as memories triggered by other events, but the therapeutic techniques involved were not studied.

Dalenberg's (1996) study described above provides the most rigorous assessment of evidence regarding the accuracy of recovered and continuous abuse memories. In interviews with the researchers, 41% of the accused fathers admitted to some of the recovered memory incidents. Fathers and daughters found some form of evidence for 70% of the total memories; all evidence was examined by the researchers. Confirming evidence was found for the same proportion of continuous memories (74%) and recovered memories (74%). Accusers rated evidence as more convincing and the accused as less convincing than the investigator's ratings.

The details of some memories (such as the age of occurrence or the identity of the abused) were demonstrated by evidence to be inaccurate. Some memories proved to contain both corroborated and unconfirmed details. Dalenberg's findings are strikingly similar to those of van der Kolk & Fisler (1995) who reported that 75% of subjects found corroboration for recovered childhood memories of abuse.

Coons retrospectively studied corroboration of abuse reports in 20 American adults with *DSM III* MPD (Coons & Milstein, 1986) and 19 children and adolescents with MPD or DDNOS (Coons, 1994a). All subjects of both studies reported abuse. Among the adults, collateral interviews and medical/emergency room records corroborated abuse in eighty-five percent. Coons used amnesia as a criteria for the diagnosis of MPD, but did not specify how many subjects' amnesia was for abuse. Similarly, retrospective record-review of the adolescent and child subjects found corroboration of abuse in ninety-four percent. Educational, social, mental health, and medical records contained confirmation of abuse via documented interviews with a wide variety of persons. All these subjects had told someone about their abuse, and child protective services had been notified. Obviously none of these subjects had complete amnesia for their abuse, and the presence of some amnesia for abuse is not mentioned.

Kluft (1995) reported on confirmation (defined as a perpetrator confession or eyewitness account) of abuse memories in 34 patients with DID. Nineteen patients (56%) produced confirming evidence. Of these 19, 10 (53%) had always recalled the confirmed incidents, and 13 (68%) obtained documentation of memories recovered in therapy. Of the

confirmed completely recovered memories, 85% had been recovered using hypnosis. Kluft also found that abuse reports were conclusively disproven in three cases (9%). This study demonstrates that in DID patients, continuous and recovered memories are at least equally likely to be corroborated, that memories recovered in treatment are often corroborated, that recovery of abuse memories using hypnosis does not necessarily produce inaccurate memories, and that some abuse memories are conclusively inaccurate.

Reports of ritual or Satanic abuse have been the most disputed of delayed memories and the last to be studied. Coons (1994b) attempted to corroborate the Satanic abuse reports of 29 outpatients via old records and collateral interviews. Three-fourths of these patients had a dissociative disorder, and the remainder had a psychotic or factitious disorder. In no case was corroboration found. Coons noted that the reports of Satanic abuse had been elicited via hypnosis (48% of subjects), dream work (34%), and regressive therapies (28%).

Bottoms, Shaver, and Goodman (1996; Goodman et al., 1994) conducted a written survey of American psychologists who reported 287 adult and 457 child ritual abuse cases. The treating psychologists reported if corroboration (witnesses, perpetrator confession, medical or physical evidence) had been reported by the patients, but the therapists did not necessarily view the evidence personally. Of the 43 cases involving delayed/repressed memories, 3% had corroboration. Of the 447 cases without delayed memories, 20% had corroboration. Goodman et al. concluded that repressed memory reports of this type of abuse had significantly less corroboration ($p < .05$) than non-repressed ones. Bottoms et al. (1996) noted that corroboration was more common (37%) in ritual abuse cases reported during childhood than in those reported adult survivors (14%). They noted that the quality and quantity of evidence was considerably better in religion-related than in ritual abuse cases and that therapists tended to be uncritical and evaluating delayed reports of ritual abuse.

In the United Kingdom, La Fontaine (1994) conducted a national survey of all allegations of ritual abuse of children between 1988 and 1991. Of 84 cases, corroborating evidence of sexual abuse was found in 41%, evidence of ritual abuse in 3%, and evidence of Satanic abuse in none. Weir and Wheatcroft (1995) studied allegations of ritual sexual abuse between 1987 and 1992 in 20 British children, 13 of whom overlapped with La Fontaine's subjects. Their evaluation included clinical data and corroboration, but is not strictly a study of corroborating evidence. They judged that non-ritual sexual abuse was likely in 40%, ritual sexual abuse in 25%, and neither type of abuse in thirty-five percent. They concluded that the proportion of false allegations of ritualized sexual abuse of children was greater than they had found in simple allegations of sexual abuse (10%). Neither of these studies are strictly memory studies. Unlike Coons' data, they

cannot be applied to delayed ritual abuse memories reported by adults.

So what may we conclude about corroboration of delayed memories of abuse? Certainly, more research is needed on factors influencing memory return. These studies demonstrate that involvement in therapy does not necessarily produce delayed memories or inaccurate ones, and that a minimum of half of delayed memories can be corroborated. The three studies of systematic corroboration of abuse memories in general clinical populations are strikingly consistent in finding corroboration in three-fourths of subjects. The above studies should not, however, be interpreted as meaning that all of the subjects' abuse memories or all of the details of memories were corroborated. Caution should also be used in defining corroboration. In research, it should be more than simply a patient's report that corroboration occurred. Personal examination of records or physical evidence and personal interviews with collateral sources are necessary to establish corroboration. It is not clear if this occurred in all studies.

The data on corroboration of abuse in dissociative disorder patients indicate that their reports of sexual abuse are very frequently corroborated, but it is unclear what percent of these experiences had been completely dissociated from the major personalities involved in adult life. The data on ritual and Satanic abuse indicate that these reports remain largely unsubstantiated and their historical accuracy should be approached with caution.

DO TRAUMA OR EMOTIONAL AROUSAL AFFECT THE AVAILABILITY AND ACCURACY OF MEMORY?

Criticism of the reliability of delayed abuse memories has largely been based on laboratory studies of memory (Belli & Loftus, 1994; Lindsay & Read, 1993; Loftus, 1993). However, as Lindsay and Read (1993) noted, the applicability of such studies to memories of abuse is uncertain. Seeing a video of a bank robber while sitting in the safety of a university laboratory is completely different from a real life experience of trauma. Certainly, most laboratory studies of memory suggestibility and reliability (see Bowman, 1996b, in this issue) are limited by lack of testing for memories of material which is traumatic, has personal consequences, or arouses emotions. The persistence and accuracy of traumatic or emotionally arousing memories are important to understanding delayed memories of abuse. This brings us to studies of traumatic or stressful memories (reviewed in depth by Koss et al., 1995). In contrast to studies of traumatic amnesia briefly reviewed earlier in this paper, these studies focus on what is remembered.

Terr's (1988, 1991) studies of children with documented traumas found that verbal memories were usually accurate, but sometimes underwent defensive changes later in

childhood that caused memories to sound vague, confused, and inaccurate (Terr, 1988). Single episodes of early trauma (before age five years) were better verbally recalled than repeated ones, and shorter traumas (less than 15 minutes) resulted in fuller verbal memories than longer traumas. Behavioral memories of early traumas (even those which occurred before age 12 months) persisted and were accurate regardless of trauma duration or repetition. Terr concluded that single (Type I) traumas to children result in retrievable detailed memories afterwards, but prolonged or variably repeated abuses (Type II traumas) are only retained in spots (Terr, 1991).

"Flashbulb memories," defined by Brown and Kulik (1977) as surprising and consequential memories, have been a model for study of trauma memories because flashbulb memories were assumed to be formed at moments of emotional arousal and to be accurately retained for lengthy periods. However, not all "flashbulb" events are personally experienced (e.g., political assassinations) or raise intense emotions. Recent overviews of flashbulb memories have concluded that they are retained for long periods but are not necessarily photographically accurate or completely consistent over time (Neisser & Harsch, 1992; Conway, 1995).

Studies of the accuracy of memories of personally experienced or witnessed traumas are probably more relevant to memories of abuse than are memories of public disasters. Yuille and Cutshall (1986; Cutshall & Yuille, 1992) found that witnesses and victims of robberies and shootings were highly accurate in details (75%-88% accurate) and were difficult to mislead about crime details. Importantly, inaccuracies reported in press accounts of the crime were not incorporated into eyewitness accounts. The above studies involved memories for crimes that are verifiable, but, unlike child abuse, were recent. One study of decades-old trauma in Holocaust victims found that memories reported in the mid-1940's and again in the mid-1980's were highly consistent, especially when details of personal abuse were recounted (Wagenaar & Groeneweg, 1990). These studies indicate that findings on laboratory-induced memory inaccuracy and suggestibility may not generalize to emotionally arousing real life events, especially personal events.

In general, studies show that violent crimes are remembered better than non-violent ones. Such observations have led to hypotheses that violent events and "flashbulb" ones are better remembered because emotional arousal leads to encoding vivid memories. Studies of personally significant events (not necessarily violent ones), show that greater emotional arousal is associated with more vivid personal memories (Reisberg & Heuer, 1992). Even public events are better remembered if they arouse emotion. For instance, in comparing memories just after the *Challenger* disaster with those two to three years later, both children (Warren & Swartwood, 1992) and adults (Bohannon, 1988; Bohannon & Symons, 1992) with higher emotional responses to the event

had more consistent memories than those with lower emotional responses.

The role of emotional arousal in memory retention was clarified by a recent study which administered propranolol or placebo to subjects prior to viewing violent or non-violent stimuli. The propranolol, which blocked physiologic arousal (noradrenergic output) associated with anxiety, blocked the enhanced memory associated with emotional arousal (Cahill, Prins, Weber, & McGaugh, 1994). The implications are that noradrenergic arousal is involved in the enhanced memory associated with anxiety-provoking events. When abuse is occurring, emotions are aroused. The above research implies that this condition would tend to produce persistent memories; however, the arousal evoked in laboratory studies likely falls far short of the terror experienced in the kind of real-life traumas that result in amnesia. For ethical reasons, the role of extreme emotional arousal in memory formation and retention remains unstudied in controlled laboratory conditions. Thus, caution is needed in applying the results of laboratory research and flashbulb memory research to trauma memories which were once forgotten.

Clinicians are well aware that available memories of traumatic events range from vivid and intrusive to complete amnesia. Critics of delayed abuse memories have emphasized the studies that indicate trauma enhances memory rather than dimming it, but the literature indicates the situation is considerably more complex. For instance, a review of laboratory studies of memory and stressful events in children found mixed results: of 15 studies, two found high stress beneficial to memory, five found no effect on memory, and eight found high stress detrimental to memory (Ceci & Bruck, 1993). In addition, victims of more severe crimes (with presumed greater emotional arousal) are less able to describe the perpetrators, probably because their attention is focused on matters of survival (Kuehn, 1974).

The relationship between emotional arousal and memory is neither linear nor exactly the inverted U of the Yerkes-Dodson law derived from animal studies (Yerkes & Dodson, 1908). Overall, the literature on stress, trauma, and memory indicates that recall is most impaired for routine emotionless events and those evoking extreme levels of emotions. In between, increases in emotional arousal facilitate recall, but a shift in locus of attention occurs. Violent events narrow the focus of attention, usually to central details, at the expense of peripheral details. This narrowing of attention is reminiscent of the situation of dissociation during trauma when focus on one stimulus is used to induce trance states that block immediate awareness of the full impact of the trauma. Studies support high and accurate retention of the details of violent or emotionally arousing events over months to years, even when they have not been discussed (Bohannon, 1988). The few studies of suggestibility of memory in actual victims of trauma have found very low suggestibility, indicating that laboratory studies of high suggestibility in eye-

witness memory may be poorly applicable to traumatized persons (Yuille & Cutshall, 1988; Cutshall & Yuille, 1992).

Recent studies on neuroanatomical and physiological changes in the brains of traumatized persons are opening new vistas in understanding the relationship of trauma to memory (see van der Kolk, 1996, for a review). While this literature is beyond the scope of this review, clinicians should be aware of several relevant findings. First, studies point to a relationship between stress or trauma and acute increases and chronic decreases in glucocorticoid levels (Howard, Olney, Frawley et al., 1955; Yehuda, Kahana, Binder-Brynes et al., 1995). Elevated glucocorticoids have been associated with damage to the hippocampus, a key area in memory retention and formation of episodic memories. While most of these studies have been conducted on animals, recently combat veterans with PTSD were found to have significantly smaller hippocampal volumes than matched comparison subjects, providing a possible link between trauma and memory alterations (Bremner et al., 1995).

Second, a study of positron emission tomography (PET) scans in PTSD patients has shed light on the mechanism of storage of traumatic and emotionally neutral memories (Rauch et al., 1996).

This study measured glucose utilization (an indicator of neuronal activity) during script-induced trauma memories and neutral memories. Compared to baseline conditions, during trauma memories, right frontal lobe somato-sensory areas increased in activity and the left-sided speech area (Broca's) decreased in activity. These findings correlate with clinical observations that trauma memories tend to return in sensory (flashback) form and can be relatively difficult for patients to describe. This study also gives us the first actual look at the different handling of neutral and terrifying memories in the brain.

CONCLUSIONS

What Memory Research Does Not Tell Us

Research on memory has many limitations. Although the studies reviewed here are those most relevant to abused persons with dissociative disorders, even these studies do not yet tell us how or why memories of abuse are forgotten, or the actual effect of therapy on memory recovery. Studies of the neurophysiology and neuroanatomy of trauma survivors do not yet shed light on whether memory storage and retrieval in persons with dissociative disorders are different from that of persons without such disorders. Research has not shed much light on the general accuracy or suggestibility of *delayed* memories of trauma, nor has it told us how to distinguish accurate and inaccurate memories.

What Memory Research Does Tell Us

Given the above caveats, what can memory research teach clinicians working with dissociative disorder patients? Studies support the reality of abused persons partly or completely

forgetting abuse, especially those with earlier abuse and more types of abuse. Research does not support charges that recovered memories exist solely in persons in therapy. Research supports clinical observations that recollection of forgotten abuse is triggered by many events. Psychotherapy is involved in returned abuse memories but is usually not the sole trigger for memory return. Research has not examined what kinds of therapies contribute to memory recovery or if/how they distort recall.

Studies of the corroborability of child abuse memories indicate that by self-report, about 50%-75% of abused persons find corroboration of being abused, and that recovered and continuous memories are equally likely to be supported by external evidence. Corroboration of reports of general child abuse among dissociative disorder patients is also quite high, and includes recovered, continuous, and hypnotically assisted memories. Studies indicate low corroborability for ritual abuse, especially Satanic ritual abuse, whether first reported in childhood or adulthood. While false suspicions by adults appear to account for most of these childhood reports, the reasons for low corroboration of adulthood reports are not clear.

Research on memories of stressful events indicate that stress has variable effects on the memories of children. In adults some physiologic emotional arousal appears necessary for the enhanced memory that is associated with violent or stressful events. Research has not demonstrated how extreme trauma causes amnesia, but does indicate attentional narrowing and inhibition of verbal encoding when real-life trauma is involved. Memories of personally meaningful upsetting events are resistant to suggestion and appear consistent over decades. Memory research on real-life trauma appears the most applicable to work with dissociative disorder patients.

RECOMMENDATIONS FOR THERAPISTS

(See companion article in this issue [Bowman, 1996b] for discussion of the clinical implications of studies on the reliability and suggestibility of memories.) In light of the above studies, my recommendations to clinicians are: Remember that corroboration is the only reliable way to tell accurate and inaccurate memories. Collect all available collateral data (collateral interviews and medical, mental health, school, and legal records) that might help you evaluate memory reports. Encourage your DD patients to take the lead in seeking corroboration of abuse. Try to personally examine corroborative evidence found by your patients. Remember that corroboration of the occurrence of abuse is not corroboration of all the remembered details. Be cautious about uncorroborated reports of ritual or Satanic abuse until further research provides clarification of their historical accuracy. In therapy, create a supportive atmosphere in which the accuracy of all memories is routinely discussed. This can help you and your patient develop healthy skepticism that

guards against false conclusions and ultimately helps your patient find the personal truths that bring healing. Uncertainty about memories can be frustrating to both the sufferer and healer. Strive to develop tolerance (in yourself and your patients) for this position, trusting that time and careful technique will eventually maximize understanding of both past and present. ■

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