Autobiographical memory for childhood events: Patterns of recall in psychiatric patients with a history of alleged trauma.

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Autobiographical Memory for Childhood Events: Patterns of Recall in Psychiatric Patients with a History of Alleged Trauma

Evan D. Parks and Richard Balon

SOCIAL scientists are currently being pressed upon by the legal and scientific communities to provide more definitive explanations regarding the nature and functions of memory (Loftus 1993). At the forefront of this debate is autobiographical memory. Autobiographical memory is a subclassification of memory within the declarative memory system and signifies memory for one’s own personal life experiences in the recent and/or remote past. This study investigates the relationship between early trauma and memory for childhood events in adult psychiatric patients. The findings suggest that patients with an alleged history of trauma have a measurably different pattern of recall for early events than the patient and nonpatient comparison groups.

An association between trauma and disorders of memory is increasingly reported in the literature. Case studies suggest that some patients have recalled previously forgotten trauma (Rieker and Carmen 1989; Williams 1987). Also, patients who report having limited recall of abuse at the onset of treatment, subsequently report having recalled additional abuse and/or information about the alleged abuse during treatment (Herman and Schatzow 1987).

To account for the disturbed memory processes observed in clinical settings, several theories have been advanced. The repression hypothesis has received considerable attention and has typically proved to be a difficult hypothesis to test. To account for her clinical observations of traumatized children, Terr (1991) suggests that memory for the events of repeated trauma are repressed, denied, and dissociated in order to protect the psyche and preserve the sense of self. The traumatized children may have little or no memory for the specific events of the repeated trauma due to the utilization of defensive processes. As further evidence of the utilization of defensive processes, symptom formation occurs that appears to be linked to the displacement of affect associated with the traumatic events.

Experimental investigation of repression was stimulated as defenses began to be reexamined as cognitive processes (Ederlyi 1985). Davis and Schwartz (1987) suggest that repression results from the limited rehearsal of self-referent affective information leading to poor encoding of information and weak associative pathways. Their research indicates that individuals who utilize a repressive mode of

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processing information recalled fewer negative childhood memories and have older earliest memories than did the high-anxious and low-anxious comparison groups (Davis and Schwartz 1987). In an attempt to experimentally examine the impact of trauma on memory, Christianson and Nilsson (1984) had subjects observe a series of traumatic photographic slides (grotesque forensic pathology photos) and neutral slides. The subjects evidenced good recall of the neutral stimuli that were presented before the traumatic stimuli but had impaired recall of both the traumatic stimuli and the neutral stimuli that followed. Relying on cognitive theory and the information-processing model, the researchers suggest that the impaired memory results from poor initial encoding of material due to the interference in attentional processes caused by heightened emotional and physiological arousal (Christianson and Nilsson 1984).

The defense of dissociation provides another theory thought to have sufficient explanatory power by some investigators (Putnam 1989; Schacter et al. 1989). Dissociation, employed primarily in context of traumatic experiences, is thought to account for the amnesia that exists between personalities in individuals who have multiple personality disorder (MPD). Using a variety of explicit and implicit memory tasks, investigators have demonstrated that some types of information that is learned by one personality in an MPD patient is not transferred to or learned by a second personality (Nissen et al. 1988). The use of dissociation leaves the patient with an asymmetrical pattern of amnesia for his or her personal history. Based primarily on structured clinical interviews, adult patients who were diagnosed with MPD reported having poor memory for specific periods of their life (Putnam et al. 1986; Ross, Miller, Beagor et al. 1990).

Concurrent with the growth of information regarding the relationship between memory and trauma has been equally important information concerning the malleability and distortion of memory (Loftus 1991, 1993). Memory of previous trauma in some cases has been shown to be an artifact of the therapy or interviewing process (Loftus 1993). It is important to note that the recent information regarding the malleability of memory may not necessarily conflict with the data that supports the relationship between trauma and the impaired recall of autobiographical information. These may in fact be exclusive types of phenomena. To date, there are no comprehensive models that can account for all the individual aspects and functions of memory.

The purpose of this study was to investigate whether adults with an alleged history of childhood trauma are more likely than nontraumatized adults to have deficits in the retrieval of early autobiographical information. Given the diversity of the theories regarding memory, the limited experimental support for the theories, and inherent limitations in the models of memory, it was not possible to adopt or build hypotheses on a single theory or model of memory that would account for the observations. For the purposes of this study, autobiographical memory was defined as memory for personal experiences from everyday life (Rubin 1986).

The alleged trauma group was hypothesized to have specific limitations in the recall of childhood events not observed in the patterns of recall of the nontraumatized control groups. The memory limitations include: (1) a greater number of retrieval failures in response to stimulus cues, (2) increased response latency in the retrieval of memories, (3) a recency effect in the temporal distribution of memories, and (4) the mean age of earliest memories dated at a chronologically later age than the two comparison groups.

It was recognized that there are multiple combinations of the accurate and inaccurate verbal reports with the presence or absence of actual events. It is not known if a report of trauma by a subject is a true-positive or a false-positive statement. Conversely, the nontraumatized control subjects may actually have consisted of some individuals who presented an incorrect or a false-negative report of no his-
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If the dissociative or repression hypothesis is valid, the patients in the control group may not be aware of their amnesia, exhibiting a type of anosognosia of their psychopathological condition (Putnam 1989).

METHODS

Subjects

Three groups were utilized in the study, an alleged trauma patient group, a patient control group, and a nonpatient control group. The alleged trauma group and patient control group were selected from outpatients in a suburban private psychiatric clinic (age range, 20-54 years). The alleged trauma group (n = 20) was randomly selected from a pool of 48 patients with an alleged history of childhood trauma and consisted of 14 females and 6 males (mean age = 37.5 years, SD = 8.6; mean education level = 15.4 years, SD = 3.5). A patient control group (n = 17) from the nontrauma patient population (n = 72) was recruited to correspond to the trauma group for age, gender, and education (mean age = 38.3, SD = 8.9; mean education level = 16.3 years, SD = 3.9). Six patient group subjects were sought to correspond to the alleged trauma group in the age range 45-54; only three subjects were available in this age group from the patient population. Finally, a nonpatient control group (n = 20) was recruited to correspond to the trauma group (mean age = 38.6, SD = 8.8; mean educational level = 15.9 years, SD = 3.6). All subjects were White suburban residents. A written informed consent was obtained from all subjects at the beginning of the study. Inclusion in the study required the subjects have no previous history of organic brain damage or substance abuse. Membership in the nonpatient control group also required that the subjects had no previous psychiatric history.

Trauma was defined as follows: (1) physical abuse (e.g., beatings leading to bruising and/or injury), (2) sexual abuse (e.g., being forced to perform sexual acts), (3) profound neglect (e.g., failure of the parent to provide for the basic physical needs of the child such as food or medical care; isolation of the child by keeping him or her in locked closets), (4) psychological terrorism (e.g., threatening to kill, burn, or otherwise seriously harm or abandon the child, causing great fear in the child), (5) chronic alcohol or drug dependence of one or both parents (McGee and Wolfe 1991; Ross, Heber, Norton et al. 1989). All ages up to and including the 15th year of life were defined as childhood. The medical records of the clinic were used to identify the trauma and nontrauma patients. Patients selected for the research were screened again by the interviewer to ensure the accuracy of the medical record.

The composition of the alleged trauma group was relatively homogeneous in regard to the type of trauma experienced. Fifteen subjects reported ongoing physical and/or sexual abuse as the primary alleged childhood trauma. Two subjects had chronic alcoholic, drug-abusing parents as the sole traumatic experience. Psychological terrorism and profound neglect accounted for the remaining three subjects.

Measures

The word-cueing technique was employed as a stimulus for eliciting early memory. Using the standard cueing methodology originally developed by Crovitz and Schiffman (1974) and later modified by Robinson (1976), the word-cueing technique includes the use of object, activity, and affect (feeling) words. Following the modification of Robinson's basic design of 16 words per cue category by Schacter and his associates, a shorter list of 8 words for each cue type was randomly generated from an original list of 16 words per cue type (Schacter et al. 1989). Schacter et al. (1989) found the briefer 24-word list to be as effective in eliciting autobiographical memory as the longer list containing 48 words. The cue list contained a total of 24 words in 3 categories, 8 object words, 8 activity words, and 8 affective words.

To obtain a second, comparative mea-
sure of autobiographical memory, the survey of early memories developed by Mayman (1968) was employed. This technique has subsequently been referred to as the Early Memory Test (EMT—Nigg et al. 1992). The purpose of the EMT in this study was to generate information concerning the specific ages of earliest memories. The subjects were asked to provide their (1) earliest memory, (2) next earliest memory, (3) earliest memory of mother, (4) next earliest memory of mother, (5) earliest memory of father, (6) next earliest memory of father, (7) earliest happy memory, and (8) earliest unhappy memory.

Verbal memory was assessed using the Logical Memory subscale of the Wechsler Memory Scale—Revised (WMS-R—Wechsler 1987). The subscale was administered to the subjects on two separate trials. After a delay of 30 minutes, the subjects were prompted again to restate all that could be recalled from the previous trial. Norms were available for statistical comparison of each subject’s performance relative to the respective age cohort. The verbal memory ability of the three groups was compared to establish their equivalence.

**Procedures**

For each subject, the administration of all instruments took place during a single setting, lasting approximately 100 minutes. The subjects were informed that the study was designed to investigate early memories of personal events. The subjects were informed that individual words would be read by the examiner, and that they should, “think of an experience from your own life which the word reminds you of” (Robinson 1976). The following constraints were included in the instructions: (1) the reported experiences must be an event the subject was directly involved in rather than an experience of someone else; (2) the experience must be a specific event, rather than a general memory of childhood experiences; (3) all reported memories needed to be from the period of age 15 years, 11 months and younger. The response to each cue was timed; one minute was provided to respond.

The administration of the word-cueing technique occurred in two phases. In the first phase, the subjects were asked to provide a memory in response to each cue. If the subject failed to recall a memory to a cue within 60 seconds, a response failure was recorded for that cue. The second phase of the administration involved the subject reviewing each memory episode recorded in phase one and dating the reported event. The subjects were asked to provide, at a minimum, the year and month for each experience. Between the first and second phase of the cued recall administration, part one of the Logical Memory subscale of the WMS-R was administered. After completing the word-cueing technique, subjects were administered the EMT. Following the EMT, the WMS-R Logical Memory subscale, part two, was administered.

The WMS-R scores for each group were compared by analysis of variance (ANOVA). Retrieval failures and the distribution of memories were each examined by the repeated measures ANOVA with post hoc assessment of significant results using the Tukey honestly significant difference (HSD) test. ANOVA was applied to the response latency measure and the EMT, with post hoc analysis of significant results with the Tukey HSD.

**Results**

**Verbal Memory**

An ANOVA comparing the mean scores of the three groups on Logical Memory scale I (immediate memory) was not statistically significant. An ANOVA comparing the mean scores of the three groups on Logical Memory scale II (delayed memory) was not statistically significant. The nonsignificant results support the assumption of equivalence between the three groups with regard to immediate and delayed verbal memory.
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Increased Retrieval Failures

A repeated measures analysis of variance was utilized to assess retrieval failure by cue type, group effect, and interaction of cue type and group. The mean of the retrieval failures of the alleged trauma group, the patient control group, and the nonpatient control group was found to be statistically significant ($F = 7.78, df = 2, 54, p = .001$), indicating a main effect for retrieval failure. Table 1 contains the mean retrieval failures and standard deviations for each group and cue type. The repeated measures ANOVA reports statistically significant retrieval failure effects by cue type ($F = 16.42, df = 2, 108, p < .000$) and group by cue type interaction effects ($F = 3.23, df = 4, 108, p = .015$). Since statistically significant interactions were found, the form of interaction was investigated to determine if inferences regarding the main effects were confounded.

A Tukey HSD (honestly significant difference) test indicated that the mean for the alleged trauma group (3.65) was significantly greater than the mean for the patient control group (1.47) and significantly greater than the mean for the nonpatient control group (1.55), thus supporting the hypothesis of increased response failures in the alleged trauma group. Looking specifically at the pattern of response failure by cue type, Figure 1 depicts differences in mean scores for each type of retrieval failure. As seen in Figure 1, the interaction is slightly disordinal due to the reversal in mean scores that occurs for the affect and object cue classification between the patient and nonpatient control groups. Tukey’s HSD procedure was used to find statistically significant differences among the groups for each of retrieval failures by cue type. The post hoc tests indicate no significant difference among the three groups for object and activity failures ($\alpha = .05$). However, significant differences were found ($\alpha = .05$) for affect cue retrieval failures between the alleged trauma group and the two control groups.

Increased Response Latency

The ANOVA compared the mean of response latency of the alleged trauma group, the patient control group, and the nonpatient control group. This was found to be statistically significant ($F = 7.15, df = 2, 54, p = .002$), indicating a main effect for response latency. A Tukey HSD test indicated that the mean of the response time for the alleged trauma group (29.47 s) was significantly greater than the mean for the patient control group (23.82 s), and the mean of the nonpatient control group (20.21 s), thus supporting the second hypothesis.

Temporal Distribution of Memories

The dates of the reported memory events in the cued recall condition ranged from 24 to 191 months (15 years, 11

Table 1

<table>
<thead>
<tr>
<th>Cue Type</th>
<th>Trauma</th>
<th>Group Type</th>
<th>Patient</th>
<th>Nonpatient</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Object</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>0.750</td>
<td>0.294</td>
<td>0.200</td>
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</tr>
<tr>
<td>SD</td>
<td>0.851</td>
<td>0.588</td>
<td>0.410</td>
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<tr>
<td><strong>Activity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>0.700</td>
<td>0.412</td>
<td>0.500</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>0.801</td>
<td>0.618</td>
<td>0.761</td>
<td></td>
</tr>
<tr>
<td><strong>Affect</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>2.20</td>
<td>0.765</td>
<td>0.850</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>1.576</td>
<td>0.831</td>
<td>1.424</td>
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</tbody>
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months). The distribution of the memories was plotted using the frequency of recall events that occurred within the 15 12-month increments of time extending from 24 to 191 months.

For statistical analysis, the range of memories from 24 to 191 months was divided at the midpoint of 108 months. This point, although arbitrary, served as the division between what is termed "early" and "late" memory. Table 2 contains the means and standard deviations of the temporal distributions of memories. To determine if statistically significant differences exist among these means, a repeated measures ANOVA was applied where the group designator was the between factor and the time was the within group factor. The repeated measures ANOVA indicates statistically significant group effects \((F = 5.64, df = 2, 54, p = .006)\), time effects \((F = 9.21, df = 1, 54, p = .004)\), and group by time interaction effects \((F = 3.52, df = 4, 54, p = .037)\). Since statistically significant interactions were found, the form of the interaction was investigated to see

Table 2

<table>
<thead>
<tr>
<th>Time</th>
<th>Trauma</th>
<th>Group Type</th>
<th>Nonpatient</th>
</tr>
</thead>
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<tr>
<td></td>
<td></td>
<td>Patient</td>
<td></td>
</tr>
<tr>
<td>Early</td>
<td>Mean</td>
<td>7.9</td>
<td>9.58</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>2.9</td>
<td>3.97</td>
</tr>
<tr>
<td>Late</td>
<td>Mean</td>
<td>12.55</td>
<td>12.82</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>2.882</td>
<td>3.377</td>
</tr>
</tbody>
</table>
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if inferences regarding the main effects were confounded.

The interaction is disordinal due to the reversal in mean scores that occurs for the early and late time classifications between the nonpatient group and the alleged trauma and patient control groups. Tukey’s HSD procedure was used to find statistically significant differences among the groups for each type of time category. The post hoc tests indicate no significant difference among the three groups for late memories (α = .05). However, significant differences were found (α = .05) between the alleged trauma group and the nonpatient control group for early memories.

Earliest Memories

The ANOVA compared the mean of the earliest memories of the alleged trauma group, the patient control group, and the nonpatient control group. This was found to be statistically significant, (F = 6.38, df = 2, 54, p = .003), indicating a main effect for earliest memory. A Tukey HSD test indicated that the mean of the earliest memories for the alleged trauma group (68.71 months) was significantly greater than the mean for the nonpatient control group (52.28 months). The mean for the patient control group (57.88 months) did not significantly differ from the mean of either of these groups.

DISCUSSION

The results of this study indicate that psychiatric patients with an alleged history of childhood trauma demonstrate a measurably different retrieval pattern for autobiographical information when compared to the patient and nonpatient control groups. Controlling for general verbal memory ability, the alleged trauma group evidenced increased response latency and a greater number of retrieval failures to cues when compared to the two control groups. The alleged trauma group also reported significantly fewer early memories and had older earliest memories when compared to the nonpatient control group.

The information-processing model posits encoding, storage, and retrieval factors as important when accounting for impairments in memory. There is strong evidence that trauma disrupts the smooth, integrated functioning of normal memory processes (Christianson and Nilsson 1984). According to Spiegel and Cardena (1991), "In addition to the possible cognitive disorganization fostered by intense anxiety, the strong focus on the traumatic content may impair memory by disembedding the perception from its context, making the traumatic event much more unusual, salient, and hence, difficult to integrate with the person’s repertoire of experiences." Childhood events, both negative and closely associated neutral episodes, may receive shallower encoding due to heightened levels of physiological arousal resulting from trauma. Given the chronicity of the trauma that many of the subjects endured throughout childhood, it is not difficult to speculate that patterns of hypervigilance, anxiety, and increased arousal were regular features of daily existence. Undistracted attention, periods of consolidation, and frequent reviews of important life events may not be features of the characteristic memory processes of traumatized children. Although the information is likely to be stored, it may not be sufficiently encoded to be retrieved during subsequent attempts at recall.

The constructs of repression and dissociation appear to have applicability to our findings. Painful, unacceptable, and anxiety-producing memories may be separated out via dissociation, or transformed and condensed by repression, having the overall effect of reducing the amount of accessible information. The finding that the alleged trauma group produced a greater number of retrieval failures specifically to the affective cues adds support to this conclusion. Data analysis also revealed that the alleged trauma group had significantly more retrieval failures to affective cues than either the patient or normal control groups. It appears that affect-laden
early childhood information associated with the cues may have been impacted by defensive processes, making the material less available for direct recall.

By predicting a recency effect in the temporal distribution of memories, one is postulating the alleged trauma group will have fewer available early memories to draw on. This would increase the likelihood that the distribution of memories would be negatively skewed in the alleged trauma group. The alleged trauma group reported fewer early memories than the nonpatient control group, as predicted, but was not significantly different in the portion of late memories. Added support of this hypothesis was observed in the EMT results; the alleged trauma group's mean of earliest memories (68.7 months) was chronologically older than the mean of the nonpatient control group (52.28 months). While it may appear that alleged trauma group has fewer actual early memories, these results do not provide evidence of a limited fund of early memories or that the memories are not accessible. The findings should only be taken to indicate that the alleged trauma group was less efficient at recalling early events under the testing conditions.

Upon initial consideration, the mood state and presence of psychopathology in the alleged trauma group might be assumed to adversely impact recall of childhood events. Research does not provide convincing support for this assumption. A clinically depressed condition is not associated with impairments on long-term memory tasks (O'Comer et al. 1990). In depressed patients with short-term memory deficits, the impairment may be primarily due to the negative effects of antidepressant medications (Deptula and Pomara, 1990). Autobiographical memory functioning of anxious and depressed patient has been demonstrated to be similar in pre- and posttreatment examinations (Williams, Watts, Macleod and Matthews, 1988; Plantes, Prusoff, Brennan, and Parker, 1988). Also, psychiatric patients have been found to be significantly more accurate in recalling negative childhood events when compared to their nonpsychiatrically disturbed relatives (Robins et al. 1985). Although mood and psychopathology cannot be completely expelled as a possible confound of this study, evidence is not available to suggest mood state or general psychopathology alone leads to inaccurate or limited recall of early childhood information. Future investigations controlling for mood and psychopathology will likely add further support to these assumptions.

One factor that may have increased the strength of the relationship between the alleged trauma group and memory in future studies is the use of a restricted definition of trauma. As stated previously, for this research, trauma was broadly defined, encompassing five trauma-related conditions that may actually vary qualitatively. Although there is limited evidence that children who live in homes of substance-abusing parents are at increased risk of psychological maladjustment (Cook and Winoker 1985; Jones and Houts 1992), it is not known if this type of early environmental distress is comparable to the distress associated with physical or sexual abuse. Had a more stringent definition of trauma been employed, limiting the trauma group to alleged sexual abuse, for example, greater differences between the alleged trauma group and the patient control group may have been observed.

The cued recall methodology used here and by Schacter et al. (1989) has been demonstrated to have some utility in investigating autobiographical memory. Further research with these instruments should be conducted with clinical and nonclinical populations.

CONCLUSIONS

The central issue raised by this study is the nature of the interaction of external, environmental factors and internal cognitive processes. This research suggests that external factors influence memory
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processes to the degree that some cognitive processes are slowed, the accessibility of information is limited, and the range of years one could draw information from is restricted. An additional question concerns the duration of the deleterious effects of early childhood trauma. If memory processes are impacted early in development, and if the effects are stable over time, extending into adulthood, it may be reasonable to speculate the memory deficits observed here would not easily be ameliorated by the effects of psychotherapy. It might be posited that patients with a history trauma who demonstrate poor recall of childhood events may continue to have limited recall even after treatment.

Finally, although it is highly suspect that trauma plays a key role in the disruption of memory processes, it would be speculative to assume a linear causal relationship between trauma and impaired recall. Other factors—such as the amount of available emotional support during childhood, the age of the child during abuse, and basic constitutional factors—may also be consequential in determining the degree of alteration in cognitive processes. Subsequent research should investigate the role of other variables not considered here.

REFERENCES


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