

# The earliest recollection: A new survey

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## Abstract

High school ( $N = 150$ ) and college ( $N = 164$ ) students completed a survey of their earliest personal recollection (ER). These memories typically were of events occurring in the fourth year of life, and varied widely in terms of content and associated affect. The ERs of the high school sample were dated significantly later, contained more traumatic content, and were more likely to possess the qualities of a "screen memory" than were those of the college sample. Upon retest three months later, 58% of the high school students recalled the same ER as on the first trial. For those recalling a different ER, the second was rated as more pleasant than the first, and was less likely to contain traumatic content. In the college sample, those subjects whose ERs were of events occurring after the fourth birthday or which fit the definition of "screen" memories scored higher on the PRF Harmavoidance scale. Implications of these findings for future research are discussed.

Earliest recollections from childhood are often shared by college roommates and by guests at cocktail parties, and frequently collected from patients by psychotherapists. This activity suggests that both naive and professional psychologists share Hall's (1899) and Titchener's (1900) belief that they are of some importance. Intuitively, early recollections are interesting for at least two reasons. First, despite the wealth of experiences which young children have, their autobiographical records are typically quite fragmentary before about age seven, and the earliest memory is rarely dated before age three. Moreover, those events that we can remember—or, depending on whom one believes, perhaps those that we cannot—often appear to be marked with special personal significance.

Most theories of early recollections have been concerned with the apparent poverty of adults' recollections of their first several years,

This research was conducted at Harvard University, and was supported in part by Grant #MH-33737 from the National Institute of Mental Health, United States Public Health Service, and in part by a grant from the William F. Milton Fund of Harvard University. We thank Beverly R. Chew, Robert H. Dworkin, Mary Harackiewicz, and Harold Rosen for their assistance in conducting the research. Address reprint requests to John F. Kihlstrom, Department of Psychology, University of Wisconsin, W. J. Brogden Psychology Building, 1202 West Johnson Street, Madison, Wisconsin 53706.

or childhood amnesia. Freud (1899, 1901) observed this in his clinic patients, and suggested that it was due to the repression of anxiety-evoking preoedipal experiences. Those memories that remained available in consciousness were shaped by the defense mechanisms of condensation and isolation so that they were devoid of affect: these were "screen memories," whose purpose was to aid in the repression of more threatening material by giving the individual something to remember. Schachtel (1947), offering an eclectic combination of Freud and Bartlett (1932), suggested that childhood memories were encoded in terms of preoedipal schemata which were incompatible with the schemata employed by adults to guide the process of memory retrieval and reconstruction. Neisser (1962) added Piaget to Freud, and noted that the beginning of continuous autobiographical memory typically corresponds to the shift from preoperational thought to concrete operations. This suggests a purely cognitive as well as an emotional reason for childhood amnesia, if the schemata employed in concrete or formal operations are incompatible with the preoperational ones which shaped the original memory encoding. Most recently, White and Pillemer (1979), working from a neopiagetian framework, have suggested that the young child does not have the attentional capacity to encode memories in easily retrievable form. Until this capacity develops, the child is unable to intentionally process episodes in narrative memory. Some isolated episodes do get encoded because of their emotionally arousing nature; others attain this status because of their emotionally arousing nature; others attain this status because of sheer repetition, in which case they lose their spatiotemporal particularity and are preserved as generic or semantic memories. The memories are available in storage, but because they are not elaborately encoded and lack rich connections to other knowledge structures, they are difficult to access at the time of attempted retrieval.

Aside from Freud's, all of the theoretical accounts described are tied explicitly to current trends in cognitive and developmental psychology. The positions of Schachtel and Neisser anticipated more recent arguments concerning encoding specificity in memory (Tulving & Thomson, 1973), while White and Pillemer's notions are congruent with the current emphasis on depth of processing in memory ( Craik & Lockhart, 1972), and are largely consistent with recent research and theory emerging from the animal laboratory concerning learning in neonates (Campbell & Spear, 1972; Coulter, 1979; Spear, 1979).

Despite this wealth of theoretical interest in childhood amnesia, empirical evidence for the existence of the phenomenon itself is sur-

prisingly sparse. A number of surveys (reviewed by Dudycha & Dudycha, 1941; see also Weiland & Steisel, 1958) indicate that the average earliest recollection is of an event occurring in the fourth year of life. More extensive samples of early childhood recollections, whether by the method of free recall (Smith, 1952; Waldfogel, 1948) or that of cued recall (Chew & Kihlstrom, Note 1; Crovitz & Quina-Holland, 1976; Karis, Note 2) rarely elicit memories of events occurring before kindergarten. However, there is no convincing evidence from studies of humans that the alleged childhood amnesia is distinct from the ordinary forgetting that would occur in adults over a comparable period of time. What is required is the human equivalent of the design employed in studies of infrahumans, where neonates, juveniles, and adults are tested over equivalent retention intervals with careful control over the conditions of encoding and retrieval.

A substantial amount of activity has been devoted to exploring the relations between personality and early childhood recollections. As noted earlier, Freud (1899, 1901) held that early childhood experiences were repressed, leaving only screen memories available for recall, but this hypothesis has been difficult to test empirically (Child, 1940): should neurotics have fewer early recollections because of repression, or should they have more because repression has been less successful? Two early studies, in which subjects simply indicated by checkmarks how many memories they had at particular ages, gave contradictory results: Crook and Harden (1931) found that subjects with low scores on a neuroticism scale had more early recollections, and an earlier age of first memory, than did their more neurotic counterparts; however, Child (1940) obtained no such correlations. Waldfogel (1948), employing the method of free recall, found that subjects with relatively few early recollections had higher neuroticism scores than did those with a relatively rich corpus of childhood memories.

A somewhat larger number of studies have been devoted to examining the relation between aspects of personality and other descriptive features of the earliest recollection. The two principal approaches to this topic differ in their conception of early recollections as concealing or revealing (Kramer, Ornstein, Whitman, & Baldrige, 1967). Freud (1899, 1901) held that those memories that were available to the person were only screens, whose surface features must be analyzed and interpreted to reveal the latent memories which they covered. Adler (1937; Ansbacher, 1947, 1973), on the other hand, argued that the manifest content of early recollections is interesting in its own right, as it represents the lifestyle adopted

by the individual. These and other, similar, arguments have led to the use of early recollections as a projective technique in clinical practice (e.g., Kramer et al., 1967; Mayman, 1968; Mosak, 1958; Saul, Snyder, & Shepard, 1956). Some formal studies of early recollections, especially those emanating from the psychoanalytic tradition, have been hampered by the use of extremely cumbersome coding schemes which attempt to cover the minutiae of psychoanalytic theory (e.g., Langs, 1965a, 1965b; Levy & Grigg, 1962; Mayman, 1968). Other studies have compared the features of the earliest recollection among groups of patients differing in psychiatric diagnosis (e.g., Hafner, Corotto, & Fakouri, 1980; Weiland & Steisel, 1958), sharing with the first type a reliance on methods of psychiatric diagnosis with doubtful reliability and validity. Somewhat more appealing on methodological grounds are several attempts to relate surface features of the earliest recollection to common trait constructs as measured by objective questionnaires (for reviews see Ansbacher, 1947; Mosak, 1969; Osherson, Note 3; Taylor, 1975). While these studies have been relatively free of the problems besetting the other two types, evidence for systematic relations between generalized behavioral dispositions such as security and dependency on the one hand, and the content or affective valence of early recollections on the other, is not particularly strong. The purpose of the present study was to help reopen this area of inquiry by conducting a new survey of the earliest recollection, employing more adequate means of personality assessment.

#### Method

The present research was originally conceived as two studies. Because there is considerable overlap in their methods and findings, however, for purposes of economy in exposition the two experiments have been combined.

#### *Subjects*

A total of 164 undergraduate and graduate students at Harvard University and 150 high school students in a suburban Massachusetts public school participated in this study. The college students were recruited for a formal study of the relation between personality and memory for personal experiences, and were paid \$5.00 for a single experimental session lasting two hours. The high school students were tested during their English class.

#### *Procedure*

The subjects in both samples completed an "Earliest Memory Questionnaire" which asked for a brief written summary of their earliest memory. The subjects were instructed to think back to their childhoods and recount

the earliest event that they could remember. They were further cautioned not to describe some event which had been related by someone else, but which they did not remember personally. After this, the subjects completed a brief written inquiry concerning: their age at the time of the event (to the nearest birthday); categorical ratings of the clarity of the memory (cloudy/clear/vivid), frequency of prior recollection of the event (just now/occasionally before/often before), and the feeling involved in the memory (pleasant/neutral/unpleasant); a more specific statement in their own words of the emotion associated with the memory; the sensory modalities involved in the memory image (visual/auditory/gustatory/olfactory/tactile/kines-  
thetic); whether the visual image (if present) was in color or black-and-white; and (again if visual imagery was present) whether the subject saw him/herself or only other people.

In addition to the Earliest Memory Questionnaire, the subjects in the college sample completed the Personality Research Form, Form AA (PRF). The PRF consists of 20 content scales measuring trait constructs derived from Murray's conception of human needs, plus two validity scales; it has been rigorously constructed according to principles of construct validity, and represents the "state of the art" in personality trait questionnaire construction. Because of the close association between early recollections and anxiety in several theories, "Harmavoidance"—a construct closely related to neuroticism—was of particular interest. Subjects with screen memories, or early recollections of trauma, might be expected to score higher on Harmavoidance than those whose memories did not possess these qualities.

The high school sample did not complete any personality questionnaires as part of this experiment. However, they did receive the EMQ again during class three months later. At this second administration the subjects were asked to write down their earliest current memory, without regard for whether it was the same as the one which they had recalled previously. A total of 105 subjects completed both administrations of the EMQ.

## Results

Although all subjects provided at least some account of their earliest recollection, a few subjects in both the college and high school samples failed to provide one or more pieces of requested information about the memory. Therefore some of the analyses reported below are based on slightly fewer subjects than are included in the samples as wholes.

### *Descriptive Features of the Earliest Recollection*

A major portion of the EMQ was devoted to describing the qualities of the subjects' earliest recollection. The essential findings are presented separately for the two samples in Table 1.

*Age.* For the college sample, the modal age at the time of the event remembered was three years ( $M = 3.24$ ,  $SD = .99$ ); for the

Table 1. Features of earliest recollections.

Feature	Percent of total	
	College	High school
Clarity		
Vague	24.7	27.5
Clear	44.3	53.0
Vivid	31.0	19.5
Imagery		
Visual	98.1	87.9
Auditory	32.9	36.2
Gustatory	2.5	8.7
Olfactory	10.8	6.0
Tactile	42.4	26.2
Kinesthetic	54.4	46.3
If visual involvement		
Image in color	71.0	62.3
Subject sees self	58.1	62.4
Frequency of prior recollection		
Seldom	6.3	8.1
Occasionally	69.6	65.1
Often	24.1	26.8
Content category		
Trauma	26.7	40.7
Trivia	56.3	48.0
Transition	17.0	11.3
Affect rating		
Pleasant	43.0	35.4
Neutral	29.7	30.6
Unpleasant	27.2	34.0
Screen quality		
Absent	32.1	7.3
Ambiguous	41.2	26.0
Present	26.7	66.7

high school sample, the modal age was four years ( $M = 3.91$ ,  $SD = 1.26$ ). The average ages differ significantly,  $t(311) = 5.70$ ,  $p < .001$ , 2-tailed. Although the age distributions in the two samples were rather similar, the college distribution did contain proportionately more young ERs,  $\chi^2(5) = 29.69$ ,  $p < .001$ .

*Clarity and imagery.* For the vast majority of the subjects (74.3% and 72.5% in the college and high school samples, respectively), the memory was rated as being at least moderately clear. Visual imagery

was most prominent in both groups, followed by kinesthetic and tactile imagery; auditory imagery was rather rare, while gustatory and olfactory imagery was virtually absent. The total number of sensory-perceptual modalities involved may serve as one index of the richness of the reconstructed memories. The two groups were marginally different in this regard (college:  $M = 2.41$ ,  $SD = 1.04$ ; high school:  $M = 2.12$ ,  $SD = 1.08$ ;  $t(305) = 2.39$ ,  $p < .05$ , 2-tailed). Most of the memories (84.8% and 87.9% of the college and high school samples, respectively) involved no more than three modalities. In those cases involving vision, the image was typically in color, and the subjects usually reported seeing themselves in their visual image. The clarity ratings were not substantially related to the number of imagery modalities involved ( $r = .07$  and  $.20$  for the college and high school samples, respectively). Color visual images were rated as slightly clearer than those in black-and-white ( $C = .23$  and  $.22$  for the college and high school samples, respectively; both  $p < .05$ ).

*Frequency of prior recollection.* Most of the ERs elicited (more than 90% in each sample) had been recalled by the subject at least occasionally prior to the testing session. On the other hand, roughly one-fourth of the subjects reported that they thought of their particular ER "often."

*Content class and associated affect.* The ERs were sorted into three broad categories based on their surface content: trauma (e.g., severe illness, pain, extreme fright or embarrassment, very sad event); transition (involving some change and often precisely dated—e.g., birthdays, births of siblings, moving to a new house, first day in school, and other "firsts" of various kinds); and trivia (anything that did not fit comfortably into the other two categories, but not implying that the memory was unimportant to the subject). The ERs were first rated independently by the two authors, who then worked together to achieve complete consensus. Interrater agreement may be expressed by the contingency coefficient  $C$ . They agreed in 69.7% of the college cases ( $C = .62$ ,  $p < .001$ ), and, having refined their personal criteria by reaching consensus on these, agreed in 85.3% of the high school cases ( $C = .73$ ,  $p < .001$ ). Only the final consensus ratings of each sample are discussed here.

The distribution of the memories across content categories was different in the two groups,  $\chi^2(2) = 15.22$ ,  $p < .001$ . In particular, there were proportionately more memories classified as "trauma" in the high school sample. Nevertheless, there was no difference in the distribution of self-rated affect associated with the ERs,  $\chi^2(2) = 2.31$ , *ns*. In both groups, a plurality of ERs were rated as "pleasant." For

Table 2. Affect associated with memories in three content categories

Content	N	Affect		
		Pleasant	Neutral	Unpleasant
<b>Trivia</b>				
College	88	55.7%	33.0%	11.4%
High school	58	60.3	39.7	0.0
<b>Trauma</b>				
College	42	9.5	21.4	69.0
High school	62	6.5	24.2	69.4
<b>Transition</b>				
College	26	53.8	30.8	15.4
High school	16	62.5	31.3	6.3

those memories with some feeling tone attached, the ratio of unpleasant memories to total memories was roughly 1:3 (.27 for the college sample and .34 for the high school sample).

As might be expected, the three classes of memories were different with respect to associated affect, with trauma memories rated as clearly more unpleasant than were transition or trivia memories, which did not differ from each other (college:  $F(2,153) = 33.42$ ,  $p < .001$ ; high school:  $F(2,133) = 79.47$ ,  $p < .001$ ). Nevertheless, a substantial minority of "trauma" memories (31% in each sample) were rated as neutral or pleasant in associated affect, as shown in Table 2. There were no other significant differences or strong trends observed in the surface features of the three classes of ERs.

"Screen" quality. The ERs were further classified according to criteria for a "screen memory" abstracted from Freud (1899). According to Freud, screen memories have four principal characteristics: they lack any feeling tone; are remembered repetitively; are predominantly visual; and the person sees him- or herself in the memory image. Rather few memories (7 and 18 in the college and high school samples, respectively) possessed all four of these qualities. Accordingly, a more liberal criterion was employed, in which memories that possessed at least three of the four critical features were classified as "screen," while those which possessed no more than one of these qualities were classified as "not screen"; memories with two such features were classified as "ambiguous" with respect to their screen quality. A minority of memories (26.7%) in the college sample but a majority of memories (66.7%) in the high school sample met this more liberal criterion for a screen memory.



### Sex Differences

The two samples consisted of roughly equal numbers of men and women (college: 83 men, 81 women; high school: 72 men, 78 women). No significant sex differences were found in either sample in terms of the surface characteristics of the ERs.

### Features of the Earliest Recollection Related to Trait Constructs

The primary purpose of this study was to explore relations between individual differences in personality and features of the earliest recollection. As this was an exploratory study, no specific hypotheses were put forward on an a priori basis, although such ER features as remoteness-recency, generic content, emotional valence, and screen status, and such personality constructs as harmavoidance (connoting difficulties in personal adjustment) were of particular interest. The obtained relations between remoteness, content class, and screen quality of the ERs on the one hand, and the Harmavoidance scale of the PRF on the other, are summarized in Table 3.

*Age.* The ERs were classified according to the age of the subject at the time of the event remembered. The subjects were divided into three age categories (age 2 or earlier,  $N = 38$ ; age 3,  $N = 63$ ; and age 4 or older,  $N = 63$ ; one subject did not report the age of his ER. Those subjects with the most recent ERs, especially those who dated their memories at five years or later, scored higher on the PRF Harmavoidance scale,  $F(2,162) = 3.24$ ,  $p < .05$ . In addition, there was

Table 3. Relations between features of the earliest recollection and scores on the PRF harmavoidance scale.

Subject classification	<i>M</i>	<i>SD</i>
Age at time of event		
2 or earlier	49.95	8.97
3	48.54	10.91
4 or later	53.38	11.95
Content		
Trivia	52.12	11.59
Trauma	50.52	11.04
Transition	46.50	8.23
Screen quality		
Present	54.89	11.51
Ambiguous	50.47	10.29
Absent	47.64	11.11

a trend for the subjects with the more recent ERs to score lower on the PRF Dominance scale,  $F(2,162) = 2.64, p < .05$ . Otherwise, no group difference approached statistical significance.

*Content.* The ERs were sorted into three broad content classes—trauma, transition, and trivia—and separate ANOVAs were again computed for each of the 20 PRF content scales. Although subjects with memories of trivia and trauma scored higher on the Harmavoidance scale than those with memories of transition, the difference did not reach statistical significance,  $F(2,162) = 2.84, p < .10$ . However, a number of other significant group differences were identified in a further exploratory analysis in which one group stood out from the other two. On Change ( $M = 58.9, 53.3, \text{ and } 51.5$  for transition, trauma, and trivia, respectively;  $F(2,162) = 5.07, p < .01$ ) and Play ( $M = 58.7, 52.2, \text{ and } 52.6$ , respectively;  $F(2,162) = 3.88, p < .05$ ), transition subjects scored relatively high; on Order ( $M = 40.3, 45.4, \text{ and } 46.6$ , respectively;  $F(2,162) = 3.84, p < .05$ ), they scored relatively low. The subjects whose ERs were of trauma or (especially) transition scored higher on the Impulsivity scale than those whose ERs were of trivia ( $M = 58.4, 60.3, \text{ and } 54.4$ , respectively;  $F(2,162) = 4.94, p < .01$ ).

*Screen memories.* The ERs were classified as screen memories by the three different criteria described earlier. Table 3 indicates that subjects whose ERs clearly possessed screen qualities scored higher on the PRF Harmavoidance scale than did those whose ERs were largely lacking in screen quality, with subjects whose ERs were ambiguous in this respect falling in the middle,  $F(2,162) = 5.46, p < .05$ . Further exploration of the PRF scales revealed the opposite pattern on Sentience, with subjects possessing screen qualities scoring lower ( $M = 53.2$ ) than the ambiguous or nonscreen subjects ( $M = 59.7 \text{ and } 58.2$ , respectively;  $F(2,162) = 4.89, p < .05$ ).

### *Consistency and Change in the Earliest Recollection*

Of the 150 subjects in the sample, a total of 105 (70.0%) took part in both the original testing session and the retest three months later. On the second trial, 61 of these subjects (58.1%) identified the same earliest memory as before, while the remaining 44 subjects (41.9%) reported a different earliest recollection.

For those subjects who recalled the same ER on both occasions, the retest reliabilities of the ratings were examined. The reported age of the event recounted in the ER and the affect associated with it were both highly reliable ( $r = .94$  and  $.83$ , respectively). The ratings of clarity ( $r = .49$ ), frequency of prior recall ( $r = .56$ ), and number of sensory modalities involved in the memory image ( $r = .59$ )

were somewhat less reliable, although the correlations involved are still highly significant (all  $p < .001$ ). Inspection of the cross-tabulations suggested that initially vague memories became somewhat clearer over time, while initially vivid memories became less salient; similarly, subjects who had recalled a new memory on the first trial reported that they had thought about the memory occasionally, while those who reported thinking about the event often on the first trial, reported at the second test that they thought about the memory less often now than before. The experimenters' judgments of content category, of course, were identical on both trials. The "screen quality" of these memories—as indexed by the liberal formal criterion remained fairly stable,  $\chi^2(4) = 12.06$ ,  $p < .05$ , 2-tailed. Note, however, that screen quality is less than perfectly consistent, with many memories gaining or losing these qualities as they were successively reconstructed. The degree to which these apparent changes are contaminated by regression artifacts is unknown at present.

For the subjects who recalled different memories on the two trials, the second memory was dated significantly earlier than the first one ( $M = 3.50$  vs.  $4.00$ , respectively;  $t(40) = 2.54$ ,  $p < .05$ ). The ratings of clarity, frequency, and imagery modalities were only moderately correlated ( $r = .37$ ,  $.34$ , and  $.54$ , respectively). The second ER, on the whole, tended to be pleasanter than the first one ( $M = 1.67$ ,  $SD = .78$  vs.  $M = 2.00$ ,  $SD = .90$ , respectively;  $t(42) = 2.15$ ,  $p < .05$ ). The "screen quality" of these memories, again as indexed liberally was quite inconsistent from the first to the second memory,  $\chi^2(4) = 3.13$ , *ns*. The experimenters' ratings of the contents of the two memories (trauma, transition, or trivia) also showed that these were not particularly stable,  $\chi^2(4) = 3.40$ , *ns*. If a trivial event were recalled on the first trial, one was also recalled on the second; if a traumatic event were recalled on the first trial, the second ER was typically of trivia. Interestingly, those whose ERs changed from one session to the next dated their ER on the first session at a significantly later age than those whose ERs remained stable ( $M = 4.02$ ,  $SD = 1.06$ , vs.  $M = 3.56$ ,  $SD = 1.10$ ;  $t(98) = 2.12$ ,  $p < .05$ ). There were no striking group differences in terms of clarity, frequency of prior recall, associated affect, or imagery.

### Discussion

The surface features of the earliest recollections collected from these two samples parallel those found in research with earlier generations of subjects (e.g., Dudycha & Dudycha, 1941; Waldfogel, 1948). For example, all studies appear to agree with the present data that the average date of the earliest recollection is between the third

and fourth birthday, that visual imagery dominates in these recollections, and that pleasant memories outnumber unpleasant ones. The ERs collected from these two samples were very much the same on these two dimensions, except that the ERs of the high school students were dated at a somewhat later age, more often referred to traumatic events, and contained proportionately more unpleasant affect than those of the college students. Moreover, there were many more memories with "screen" qualities in the high school group. It is doubtful that the students in the high school sample had actually experienced more trauma, or were more maladjusted in any absolute sense, than the college students. If the differences observed here are not due simply to sampling error, they may reflect adolescents' sensitivity to stress and unpleasantness, the effects of postadolescent intellectualization, or both.

The relations between features of the earliest recollection and scores on the PRF Harmavoidance scale are also consistent with other trends noted in the literature. Those with relatively recent ERs, or whose ERs possessed substantial screen qualities, described themselves as more fearful and self-protecting than did their counterparts whose memories did not possess these attributes. The relatively late age and typical screen quality may well reflect repressive tendencies in these subjects. On the basis of these results, further study of the psychological meaning of "screen memories" and other aspects of impoverished childhood recollections would seem warranted. It may also be worthwhile to continue the search for thematic continuities between present personal concerns and memories of past experience. A major problem for studies of personality and memory is to explicate the relations among what is accessible in an individual's autobiographical memory, the way in which these memories are retrieved and reconstructed in the specific instance, and other features of personality (Kihlstrom, 1981). Despite widespread interest in them, it has yet to be determined that early childhood recollections have any privileged status in this area of research. In any event, future work should attempt to construe these memories from the point of view of the subjects themselves—in terms of their personal constructs, goals, expectations, values, and the like (Mischel, 1973)—rather than in terms of the experimenter's own categories.

Although Dudycha and Dudycha (1933) report that early recollections collected under laboratory conditions are generally valid, in the sense of accurately representing the details of some actual childhood experience, no previous study has investigated their reliability in terms of temporal stability. It appears that the "earliest" recollection is not always as constant as the term would seem to imply:

while stable—perhaps frozen—in some subjects, in others it seems quite changeable. Where the same memory was reported on both occasions by our subjects, the judgments of date and associated affect were quite reliable; the changes in clarity, frequency of prior recollection, and imagery are suggestive of statistical regression to the mean. More interesting are those memories which changed. In these cases, the initial ERs were dated significantly later than those of subjects whose ERs were stable, suggesting a sort of reminiscence effect (Ballard, 1913) in which subjects fill in gaps in memory. Unpleasant and traumatic memories were especially susceptible to change, shifting toward the neutral and/or trivial on the second trial—suggesting selectivity in the service of avoidance. Similarly, the observation in both samples that many memories judged as traumatic by the investigators were rated by the subjects themselves as neutral or even pleasant in associated affect is suggestive of selective reconstruction and/or recoding of memories. The temporal and emotional dynamics associated with the retention and reconstruction of early childhood recollections—indeed any autobiographical memories—appear to tap important general processes involved in personality.

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*Manuscript received June 1, 1981; revised October 15, 1981.*

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