

vailed at the time of the original experiences were numerous and varied. Most commonly experienced was joy, which constituted about 30 percent of the total. Next in frequency was fear, about 15 percent, followed by pleasure, anger, grief, and excitement, all between 5 and 10 percent. Only very slight differences were noted between male and female subjects. The great variety and intensity of emotion accompanying these early experiences challenges the contention that childhood memories are for the most part banal screen memories.

Recall of pleasant events was more frequent than unpleasant or neutral events. In round numbers, pleasant memories constituted about 50 percent of the total, unpleasant memories about 30 percent, and neutral memories about 20 percent. While pleasant memories predominated with most subjects, some reversed this trend; and it was suggested that the terms, memory-optimist and memory-pessimist, used by other investigators, might also apply in this instance. The ratio of the number of unpleasant memories to the total number of memories (U/T) was used as an index of the degree of optimism-pessimism. That this trait was reasonably consistent was demonstrated by correlating the U/T ratios of the first and second recall periods. The coefficients obtained were .64 for the males and .57 for the females. It is also interesting to note that while there was a gradual increase of the number of experiences recalled with age, the relative incidence of pleasant, unpleasant, and neutral memories remained quite constant from year to year.

Individual differences in the frequency of recall and the degree of optimism-pessimism were both studied in relation to the following traits: general intelligence, memory, emotional stability, ascendance-submission, and radicalism-conservatism. The results of these comparisons were essentially inconclusive. However, it was felt that the lack of observed relationship between psychological traits and childhood memory could easily have been due to the limitations of the measuring devices employed, and were not necessarily indicative of the absence of such a relationship.

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8 Transformations of Memory in Everyday Life

Marigold Linton

In 1972, Marigold Linton undertook a singular memory experiment. Like Hermann von Ebbinghaus, who had founded the classical psychology of memory about a century earlier, she was her own subject. Every day she recorded at least two events from her own life; every month she tested her ability to remember, order, and date a sample of the events she had previously recorded. Linton has presented the basic results of the study elsewhere; here she reflects on some of its implications. How can we understand the effects of "emotionality" and "importance" on memory? What are the long-run consequences of repetition? What kinds of events will be remembered best? The answers are often surprising. Particularly intriguing is Linton's very un-Ebbinghausian forgetting curve: it is linear with a slope of 5 percent a year. How can we reconcile such a pattern of forgetting with the existence of memories more than twenty years old? Linton's own explanation, based on the diminishing effectiveness of the original retrieval cues, suggests that a different forgetting function might be observed with other forms of cueing. Perhaps she is right; perhaps, on the other hand, most of our oldest memories are the product of repeated rehearsal and reconstruction. So far, these are the only systematic data we have.

This article was written especially for the present volume.

Some years ago, my curiosity about how memory functions in a naturalistic setting led me to an investigation of my own memory. During the course of this six-year study I developed event items based on my own experiences, and later attempted to reconstruct the probable dates of the events' occurrences. (Dating may seem a rather restricted, perhaps even uninteresting behavior, but its quantifiability continues to appeal to me.) Performing a prolonged study on personal life events has, I believe, provided me with a unique perspective on memory functioning; perhaps some of these insights as well as a description of the unforeseen difficulties I encountered in conducting this research may be informative to others. I begin by briefly describing the study (more detailed presentations appear in Linton 1975, 1978) and then focus on issues that may be loosely labeled (1) episodic/semantic transformations in memory, and (2) emotion/memory interactions.

A LITTLE ABOUT THE STUDY

The stimuli for this long-term study were brief descriptions of events from my life written each day throughout the study's six-year duration. At first it seemed there might be a set of simple heuristics for describing events, but rather shortly I abandoned the search for simple regularities. So wide a range of content and presentation styles may be employed to specify events that the elements necessary or sufficient to describe "an event" have continued to elude me. To avoid unnecessary narrowness in my event pool I accepted all brief unique descriptions. (No description exceeded 180 letters, and when it was written, every item was discriminable from all other events then accessible in memory.) These criteria were dictated by my major dependent variables: dating accuracy (only unique items can be uniquely dated) and response speed (reading times must be brief/uniform enough not to differentially contribute to memory-search response times). Each newly written item was rated for salience on a number of dimensions. I return to emotionality ratings in a later section.

Memory tests proceeded as follows: Once a month items were drawn semirandomly from the accumulated event pool. After reading a pair of randomly paired event descriptions, I estimated their chronological order and attempted to reconstruct each item's date. Next I briefly classified my memory search (for example, I might "count backwards" through a series of similar events, as school quarters, Psychonomic Society meetings, and the like) and reevaluated each item's salience. After six years the experiment had reached imposing dimensions. I had written more than 5,500 items (a minimum of two times each day) and tested (or retested) 11,000 items (about 150 items

each month). Item generation required only a few minutes each day but the monthly test was extremely laborious, lasting 6–12 hours. The time required for individual memory searches varied widely from month to month as well as from item to item in the course of a single day.

MEMORY: SOME CONCEPTUAL ISSUES

The study of autobiographical memory is complicated by the modifications and changes that any newly encoded information undergoes as the result of interactions with information already in memory and through reinterpretations of existing data forced by the acquisition of subsequent knowledge. I'm speaking therefore, not only of the role that semantic memory plays in interpreting new information, but also of progressive changes in interpretation and evaluation that occur as the target information interacts with relevant information, either existing or acquired later, in the knowledge base. In our personal history, as in political or cultural histories, the importance of a singular event may be interpreted in a variety of ways, from differing historical perspectives, and may be reinterpreted repeatedly as its role in different contexts emerges. And in personal, as in many other histories, first or early events in sequences receive royal treatment, with better encoding and associated recall.

Transformation from Episodic to Semantic Memory

The issues to be raised are probably best understood if I first present my conclusion concerning the acquisition of episodic and semantic memories. Figure 8-1, which depicts this conclusion, may be summarized: "Number of trials (or experiences) has contrastive effects on episodic and semantic memories. Increased experience with any particular event class increases semantic (or general) knowledge about the event and its context. Increased experience with similar events, however, makes specific episodic knowledge increasingly confusable, and ultimately episodes cannot be distinguished." Examples of this pervasive phenomenon abound in both the laboratory and everyday experience. An event in my file notes that I was invited to serve on a distinguished board that met occasionally in a distant city. I looked forward to the first meeting with trepidation. My arrival in the city confronted me with a new airport, a new system of surface transportation, new hotel. My meeting with the new board provided 25 new names, faces, and intellectual/social styles to be absorbed. Following

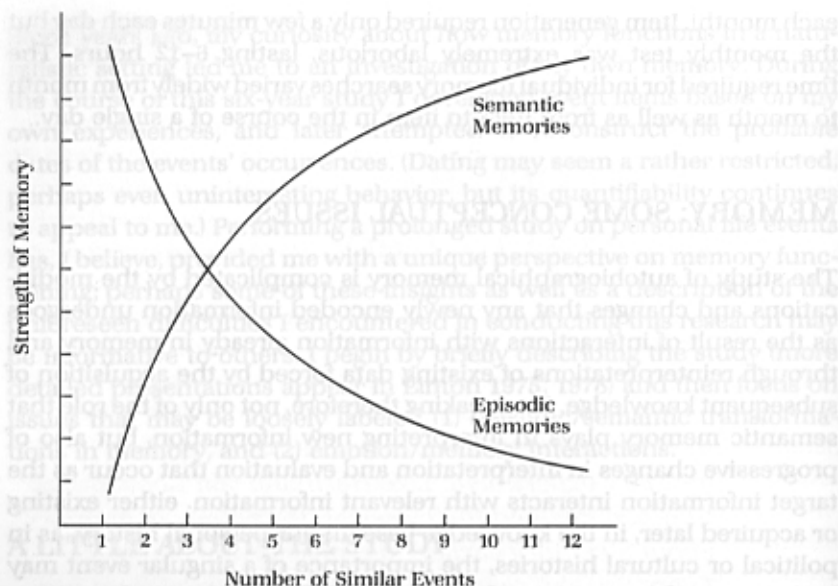


FIGURE 8-1

Number of trials (or experiences) has contrastive effects on episodic and semantic memories. Increased experience with any particular event class increases semantic (or general) knowledge about the event and its context. Increased experience with similar events, however, makes specific episodic knowledge increasingly confusable, and ultimately episodes cannot be distinguished.

this unique, attention-compelling experience this trip would be readily recalled as a discrete episode. It was long anticipated and well encoded, and the specific configuration was easily distinguished from other memory compounds. Emphasizing semantic rather than episodic memory would produce a different result (although not one documented in my study). What do I know about the airport layout? How do the ground transportation systems operate and interact? What are the board members' names? What are their relationships with each other? These questions would be vaguely and inadequately answered after only a single contact. I might know (immediately after the trip) that I was on a United flight and caught a Yellow Cab at the airport. I might recall the names of several individuals who had particularly struck me, and might remember some provocative conversational topics but I have poor understanding and poor recall of the complex interrelations among these fragments.

Some years later, after many meetings, I have lost my capacity to reliably pinpoint particular board meetings and I could not describe proceedings of most meetings—except perhaps the first, and (if it were recent) the last. But if required I could map the airport terminal; eval-

uate the airport to city transportation systems; confidently introduce committee members, and reliably predict board members' interaction styles.

By what mechanism do events or episodes become confusable with repetition? It seems plausible that a fairly small number of general schemes provide the basic framework for storing episodic information. These schemes organize the event in terms of actors, action, location, and the like. These elements that comprise the building blocks of episodic memories are themselves information from our semantic store. Furthermore, as with all semantic knowledge, some is well and some is less well learned. A specific event is an unique configuration of these elements. As our experience with a particular event type increases, we seem at first to make finer discriminations among related events; we may subdivide elements (for example, by characterizing people, actions, or locations more precisely) and identify more complex configurations of these elements. At some point, however, this expansion of elements and configuration ends. The elements, remember, already comprise part of our semantic knowledge. As similar events are repeated, the specific configurations—the patterns that link familiar elements to form unique episodes—themselves become a well-established potentially confusable part of semantic knowledge. This lack of discriminability may be plausibly attributed to encoding or to memorial difficulties: perhaps discriminations with the required resolution are not routinely made among real-world events, or perhaps desultory memory is capable of handling only relatively short descriptive chains.

The issue of memory transformations is reflected in a number of problems I encountered as I wrote events and in the successful and unsuccessful reinstatement of events in my dating exercises. I turn now to these problems.

Problems from the Study

1. **Writing items.** When I designed my study I had intended to include in my event pool each day's most salient experiences. As the preceding discussion suggests, it was relatively simple to characterize the "first event" in some on-going life sequence. A large number of cues suffice: "I go to New York for the first time." "I meet with the Carnegie Foundation for the first time." "I meet Clark Kerr for the first time." In fact, "X, for the first time" has unparalleled effectiveness as a cue. (My event writing strategy permitted any particular first item to sometimes include and sometimes omit this unique specification.) As any series of similar or related events in my life became long, the length

of the descriptions required to uniquely characterize particular events also increased. Indeed, many events could not be adequately characterized in the space permitted. Thus my file—whose contents are shaped by the requirements of brevity and uniqueness—is silent on whole sets of activities that comprise the warp and woof of my existence. One could scarcely know that I teach, or spend many hours each day in academic activities. A perusal of the file hints only faintly of my passion for racquet sports, my enjoyment of good food, or my pleasure in interacting with loved ones. I simply cannot adequately characterize the year's two-hundredth hour in the classroom, my three-hundredth racquet match, or the one-hundredth dinner with friends. But some items do enter: I teach a new class or perform a novel demonstration; I find a new racquet partner, or we find half a boysenberry pie on the court surface; a new restaurant opens, or a special friend makes a rare visit to town. These minor variations (a la Von Restorff) permit a few such items to gleam distinctively among their blurred and coalesced brethren.

2. Forgetting, failing to discriminate, and related processes. My major experimental task was to order and date items. If I could not recall an item from my description, the task ranged from difficult to nonsensical; consequently I eliminated all "forgotten" items from the event pool. Deciding what was forgotten was more complex than I had anticipated. Early in the study I began to distinguish two kinds of recall failure: (a) the "failure to distinguish" an item from others in memory at test time, and (b) simple "failure to recall" the event. Although it is unremarkable in retrospect, I was surprised to identify loss of item distinctiveness as a major source of "forgetting." I hadn't forgotten items in the sense I had anticipated—instead my written descriptions cued a number of plausible events in memory, or sometimes only a generalized memory; in particular, descriptions that discriminated perfectly among early memories in event sequences did not adequately specify happenings as the sequences lengthened.

Thus, part of my forgetting depended on the episodic to semantic transition I've described. Moreover, the study grossly underestimated transitions as a source of memory loss because items most susceptible to these changes were never written. (Recall that I included only items for which I could formulate descriptions that distinguished them from any other remembered events.) One item from the file poignantly captures the difficulty of creating items impervious to memory changes produced by the occurrence of unanticipated events. In 1972 I wrote an item approximately as follows: "I xerox the final draft of the statistics book and mail it to Brooks/Cole." Some years later after the *third* "final draft" had been submitted this item was singularly nondiscriminating.

Which event did I mean? Was the item written when I naively believed that the first draft would be the "final draft"? after the second submission when it was clear that the *final* draft had now been submitted? or was this allusion to the third submission, which historically became the "final draft"? Sometimes, of course, it was possible to guess from the language employed where an event occurred in a sequence. For example, it is most likely that an unqualified statement about "final drafts" refers to the first event in a sequence.

In short, I failed to distinguish events that contained familiar elements and configurations. These configurations pointed not to a single memorial event, but to two or more happenings. Items that I "did not recall" differed somewhat from those that I could "not distinguish." The former items often had lower salience and were more likely to be described in vague terms; in addition, the elements and configurations were sometimes relatively unfamiliar. Such items referred to plausible events that were simply not accessible in memory. Yet another kind of forgetting began to occur late in the study. During the fourth and subsequent years I began to encounter a few old items that simply did not "make sense." Often whole phrases were uninterpretable. Were these items badly written? Successful tests without comprehension problems in earlier years argue against this possibility. Thus, items that I could interpret meaningfully shortly after they were written did not, at the time of the crucial test, permit me to reconstruct a sensible whole. That these nonsense items comprised scraps and fragments from my life made this experience particularly uncomfortable. I could hear my voice describe fragments from my own life that were somehow completely meaningless. Presumably successful event descriptions reinstate general memory (semantic) frameworks that permit items to be interpreted and understood. When this cuing fails—when the semantic framework is not reinstated—I cannot reintegrate the event, and the item seems not to make sense. Total recall failure occurs after much longer delays (after four to six years) than do the other kinds of forgetting (observed as early as the first year) presumably because general semantic frameworks are more robust than specific episodic or semantic information.

3. A forgetting function. I originally expected a rapid loss of to-be-forgotten events that would produce a function resembling Ebbinghaus' classic negatively accelerated forgetting curve. Forgetting in my study should, of course, require longer than the days or weeks characteristic of Ebbinghaus' study because: (a) I employed easily encoded, meaningful, and memorable items, and (b) the study's cued-recall task allowed greater accessibility of memories than did Ebbinghaus' free-recall tasks.

These considerations, however, nowhere suggest that the shape of the present more durable curve would not be negatively accelerated. I was surprised, therefore, when several analyses suggested that items were lost from my event memory at a linear rate. Remember that although dating accuracy was my major dependent variable, if items were forgotten I removed them from my file. Thus, forgetting was a second, almost inadvertent, dependent variable. I began by considering all items written in any particular year (for example, 1,345 items describe events from 1972) and computed the number of items forgotten during each subsequent year as a percentage of the total number of items written in that target year. Cumulative forgetting curves* for each year of the study were similar and a composite function (Figure 8-2: Number forgotten/Number written) shows average forgetting for all years of the study. Fewer than 1 percent of the items were forgotten

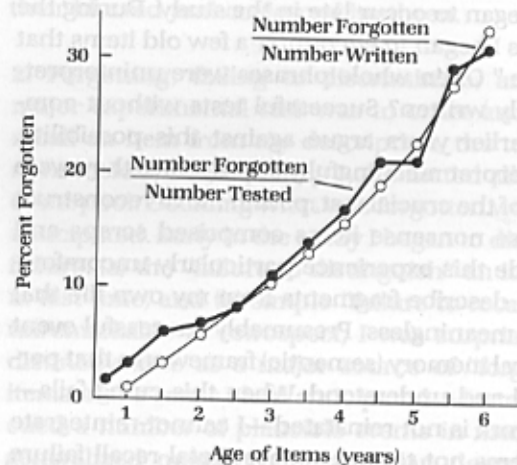


FIGURE 8-2
Percent of items forgotten during six years as a function of number of items written or number of items tested. "Number forgotten/Number written" is a cumulative function; "Number forgotten/Number tested" is a noncumulative function. Both are composites over the appropriate years.

*[That is, curves that show what proportion of the items originating in a given target year T had been tested, found to be forgotten, and removed from the pool by the end of a specified test year $T + k$; they are "cumulative" because they include not only items tested and found to be forgotten in year $T + k$ itself but also in all earlier years $T, T + 1, T + 2, \dots$. There is a different cumulative curve for each target year (those for the later years of the study having fewer points because there were fewer subsequent test years); corresponding points on these curves were averaged to form the composite "Number forgotten/Number written" function plotted in Figure 8-2.]

during the calendar year in which they were written (to consider 1972 again, ten items were written and forgotten in that year). After the first year, however, items were forgotten at the relatively even rate of 5–6 percent each year. Thus, while Ebbinghaus found rapid forgetting followed by slow forgetting, the present function indicates almost linear forgetting after an early period of almost perfect retention.

Two factors make it likely that this function actually underestimates forgetting rate. First, as items are successively tested, forgotten, and dropped from the pool, the remaining events are increasingly salient and memorable. Second, only a small subset of items of any target age is tested at any time (this is especially significant in the first year when many nonmemorable items have never been tested); hence, to consider forgetting against the baseline of all items originally written probably yields an underestimate of forgetting. These considerations suggested that a second function relating the number forgotten to the number tested at a specified test time* (rather than the total number of items written) might provide a more accurate estimate of forgetting rate.† A comparison of the resulting, approximately linear, function (Figure 8-2: Number forgotten/Number tested) with the earlier curve shows that not only have 30 percent of the items been forgotten in six years, but that in the sixth year forgetting is apparent in 30 percent of the items tested from the restricted population that remains. The first (cumulative) and the second (noncumulative) functions differ most in the first year and a half with the latter providing a higher estimate of forgetting in this period than does the earlier one.

"Failure to recall" and "failure to distinguish" contribute unequally to the total forgetting described. Because items are complex, some features of a single item may be forgotten while others are confused—thus both kinds of failure may contribute to an item's being forgotten. While the two kinds of forgetting can be discriminated, the general pattern appears to be that for young items, both failures occur about equally often. After the end of the second year, simple recall failures become increasingly frequent until they occur almost twice as often as confusions.

*[As noted earlier, about 150 items were tested monthly, 1,800 annually. In 1972, the first year of the study, all tests were necessarily of 1972 items, so the tested subset of those items was very large. (It did not exhaust the pool, however; chance determines which items are selected for test, and many are tested repeatedly.) In later years the tested subsets for various ages became appreciably smaller.]

†[Suppose that m_T items from target year T were selected for test in year $T + k$, and f_T of them turned out to be forgotten. The m_T tested items are a sample of the M_T items from year T that were still in the pool at that time, so the ratio f_T/m_T estimates the fraction of those remaining items that were no longer in a memorable state. This ratio is called "Number forgotten/Number tested" in Figure 8-2, where it has been averaged over target years and plotted as a function of event age.]

Thus, real-world episodic memories not only were found to be considerably more durable than laboratory induced memories, but over the six-year study the course of forgetting appeared to be almost linear. There are two ways that this linear forgetting of episodic memories may be viewed. If one assumes that the memories themselves are being lost, it would be plausible to hypothesize that the forgetting curve would become negatively accelerated within a few additional years (if the present rate of forgetting—about 5–6 percent a year—continued, in only a dozen more years all items in the pool would be forgotten). An alternative assumption is that even a real-world study of autobiographical memory is more "contrived" than one would guess. I expect memories to be long-lasting because, like everyone else, I can access a large number of very old memories, some of them from two or three decades past. The memories are "real" but the cues with which I dealt in this study were "real" in that sense only at the time that I wrote them. With the passage of every year the cues become more "contrived" and removed from both my contemporaneous memory organization and from cues that I would spontaneously employ to elicit these memories. If this latter notion were correct, it would be possible for most, if not all, existing cue cards to become inadequate over time; that is, these cues would not elicit personal memories which might, however, remain moderately accessible to cues more suited to my contemporary memory. This decreased accessibility of memories to my cues may be responsible for the differences in kind of forgetting. Confusions may occur when the matches between cues and memories are beginning to break down while simple forgetting and total recall failure would reflect more extreme mismatches between cues and memory organization.

Summary

Some recall difficulties in everyday memory result from episodic to semantic transformations associated with repetitions of the same or similar occurrences in our lives. In representations of personal events a number of basic semantic elements are repeatedly used and eventually configurations of these basic elements are themselves repeated, making it difficult to provide unique event descriptions. Although less significant than simple forgetting, for the present set of everyday materials decreased distinctiveness is responsible for a major memory loss. Somewhat remarkably, overall forgetting for these autobiographical items is almost linear (about 5 percent a year).

In this section I have tried to illustrate difficulties associated with describing events and some of the complexities associated with for-

getting them. In the following section I make a tentative effort to describe problems in understanding the relationship between emotionality and recall.

EMOTIONALITY AND RECALL

For more than 75 years psychologists have wrestled with the relationship between materials' emotionality and recall. Although Freud cautioned that negative memories may be forgotten through repression, our common experience is that important emotional events are often easily recalled even after many years. Such a prolonged and frustrating inquiry suggests a complex relationship between emotionality and recall. My experiment, which permitted me to examine changes in recall over many years' time with complex and salient life-related materials, seemed an ideal context in which to examine these variables. In the following I suggest some memorial and other factors that complicate this relationship.

Throughout the study I provided emotionality and importance ratings (among others) for each event item, both at the time it was written and each time its recall was tested. Although analyses of these data are not complete, the correlations between initial salience ratings and the recall measures will almost certainly remain small and unimpressive. (The relationship between current salience ratings and recall is stronger but this correlation cannot be easily interpreted.) What are some of the reasons that initial emotionality ratings are not useful in predicting event recall? A number of variables complicate efforts to deal with emotionality over time. First, the ratings of a single event may change over time. Second, superficially similar events do not receive similar ratings over time. Third, the emotionality of ongoing pieces of life, or of memories is inherently difficult to judge.

Emotionality: Habituation, Contrast, and Reinterpretation

Why do emotionality ratings of events change? Repetition of events is an important factor in predicting changed emotionality for similar events; most commonly, the emotionality of events appears to habituate. Even event classes that originally produce high levels of emotionality are likely to be judged less emotional with repetition. Thus, (a) repeated events late in a series of similar events are less emotional—*at time of occurrence*—than early events in the series, and (b) retro-

spective judgments of an event's emotionality decrease when other similar events follow.

Emotionality of events may also be affected by changes in the cognitive surround. The first of these effects may be referred to as *contrast*. Level of expectation may be raised by a single highly emotional event (Brickman, Coates, and Janoff-Bulman, 1978), or by a number of moderately important or emotional events. After the "enrichment" of the emotional environment, any particular event may look less emotional or important than it did before the change.

But other changes remotely or closely associated with the target item may affect the rated emotionality or importance of the target. Just as historians must interpret and rewrite history as time passes, so we all rewrite our own personal histories. Few of us are wise enough to be able to predict at the time of their occurrence how significant events will prove to be. A person inconspicuously enters our life. He later becomes a friend, a lover, or an antagonist. Others appear with grand flourish and then simply vanish. Thus, our salience judgments are erroneous for many events. We are offered a job. If we accept a new job that involves permanent changes in our life; for example, if it is accompanied by a move, and increased responsibility and status, the events surrounding the job offer are likely to continue to be perceived as important and emotional. If exactly the same job is turned down, salience ratings are likely to decrease over time. In general, events that initially are perceived as important and highly emotional may be perceived as less emotional or important later as the result of changes in the real world. Events may similarly increase in importance or emotionality as our perspectives on them are modified. If they come to be less important than anticipated we may simply delete them from memory. If they become more important we link them to the later crucial events—we rewrite this chapter in our lives.

Under some circumstances, the emotions currently associated with past events may be at variance with our memories of the emotions associated with the events at the time. It is often difficult to recall the intensity of past emotion—indeed, to examine a highly emotional event two, five, or ten years later is an informative experience. Sometimes the memory for the emotion is only remotely present (I may wonder *why* I experienced a strong emotion if it is obvious that I did or I may *remember* having had the emotion but be completely removed from it in the present). This discrepancy between memory of the emotion and the presently experienced emotion creates considerable problems when I attempted to rate items years later. What is the proper rating? The emotion I remember having felt when the event occurred, the emotion that is aroused now, and how do I discern the difference? Sometimes, of course, years later events may elicit clear strong emo-

tions congruent with, continuous with, or clearly identifiable as a part of the feeling present when the event occurred.

Finally, aside from issues of instability of ratings, emotions and events are inherently complex. Events may be conceptualized across small or large units of activity, their structure may be simple or complex, and they may come from many thousands of domains. To show the difficulty of making such judgments, let us attempt to answer the question: Which is more important? What is more emotional?—the love of our significant other, or a promotion? Most people probably value ongoing emotional support more than occupational advancement but any specific comparison is likely to be complicated. In most of my ratings important, unique events receive the highest ratings. Thus, receiving an important promotion would be rated higher than, for example, such repetitive events as a loved one's embrace, or a single dinner with my women's group. Part of the ambiguity results from the difficulty in knowing precisely what it is that is being evaluated, that is, the size of the memorial unit. A kiss against a promotion is hardly a fair comparison. A promotion implies a whole range of future activities—and only that kiss similarly filled with meaning should be rated as high. Furthermore, ratings are anomalous precisely because the importance of the love relationship does not inhere in the single embrace, nor the import of having good friends depend upon a single evening spent with them. On the contrary, for many individuals (although surely not all) the feelings of warmth and closeness and the significance of the relationship increase even as the specific details of the interaction begin to be lost in routine. Thus, some aspects of important events may receive relatively low ratings—and indeed these specific subevents may be forgotten relatively rapidly. But while we may forget a birthday or an embrace we are not likely to forget—ever during our lifetimes—a sustained emotional relationship. The subelements lack significance but the totality of these memories, laid down—as some artists paint—layer upon layer, create a fabric of such extraordinary durability and richness that it is never forgotten.

What features, then, characterize the emotional events that will endure in memory? For which events will emotionality remain relatively strong? Events whose emotionality will endure in memory are likely to have the following features:

1. The event must be salient and be perceived as strongly emotional at the time it occurs (or it must be "rewritten" shortly thereafter).
2. Your life's subsequent course must make the target event focal in recall; the event may be seen as a turning point, the beginning of a sequence, or as instrumental in other later activities.

3. The event must remain relatively unique. Its image must not be blurred by subsequent occurrences of similar events.

A PROPOSED NEW EXPERIMENT

This paper describes some memory phenomena I encountered during the course of my long-term memory study. Because of the restricted dependent variables and the fixed mode (several brief descriptive sentences) of cuing, it is difficult to analytically examine the course of memory in this study. For that reason I have designed a study that employs flexible cuing and far more flexible responses than did the previous study. With this procedure I hope to be able to answer the elusive question "What is an event?" What critical constellation of features is necessary to uniquely reintegrate the memory of a specific past event and how do these critical features change over time? The most provocative aspect of this technique is that it may help illuminate not only the nature of cuing, but also how episodes gradually merge into semantic memories. I record, independently, a set of descriptors, including who, what happened, where, when, why, how. Descriptive elements vary from specific to quite general. Given a pool of features that characterize a unique event, at time of test I can build item descriptions by adding cue upon cue (incremental strategy) or by omitting specific cues from more complete descriptions (deletion strategy) to determine what set of elements are most successful in reinstating a particular memory. That is, I can determine "what an event is," at least in the sense of identifying the minimum set (or sets) of cues necessary to reliably reinstate the target memory.

Before I provide a clarifying example, let me make explicit another advantage of this procedure: this study provides tremendously flexible cuing possibilities, but similarly permits a wide variety of potential responses. Any piece of information that is not *itself a cue* (at the same or a more specific level) may be requested as a response.

Let us imagine the experiment: I have drawn a random cue "John." (For simplicity let us suppose that this is a unique and well-known "John.") In a free response mode I might simply be free to summarize everything I know about John—an acquaintanceship of 25 years to be summarized in a few hundred words. Such free recall would provide me information about my semantic knowledge base. Or in a *required* response mode I might be asked to give "where?". Without further indication of specificity I might merely list cities: San Diego, Riverside. If pressed for greater specificity I could give more detailed locations within these cities. The queries might progressively provide me "who and where"; for example, "John-Sacramento." What addi-

tional information leading to a specific episode is available to me as a result of this dual cue? Again in the free response mode I would unload everything I knew about this compound cue. Or I might be queried more specifically "when?". In my memory John and Sacramento have one overlap, the (April) 1975 Western Psychological Association Convention. But the program might continue "John-Sacramento-dinner?". Of course, where had that fantastic dinner been? Specific questions that are still legitimate are now becoming restricted, but the program might still request where-specific? (What was the name/or location of the restaurant?) who? (Who were the other 12 people at dinner?) when? (exact date?) what? (the menu?) why? (What was the specific occasion?)

In short, a small set of general cues should produce broad gauge general memories, semantic memories, and perhaps even some specific favorite episodic memories. The more numerous and specific the discrete cues become, the more precisely memories should be specified. But there is no necessary requirement that any particular level of event description be the correct one. Salience ratings, either of emotionality or importance, will undoubtedly be higher for some cue combinations than others. As the integrity of events are lost over time, these effects on salience should be more pronounced. Repeated queries (spaced by years) of the same events should tell me which features of events are lost (forgotten) and how soon. Perhaps I shall learn which elements on the average are crucial for defining an event, and what happens as similar events in my personal history are repeated. This study promises a closer examination of episodic/semantic transformations, an opportunity to disentangle the impact of rigid cuing from memory loss as factors in forgetting, and perhaps even a partial answer to my old question: How does one best describe an event?

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