There is More to Episodic Memory than just Episodes

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Recently many theorists have viewed life periods as a central organizing component of autobiographical memory. We resurrect some of our old unpublished research exploring the utility of distinguishing between periods (long-term thematic generalizations), episodes (sequential narratives of specific events or sets of interrelated events) and moments (isolated often vivid instants in time). We found that people readily generated memories that differed according to the primary characteristics ascribed to these units, as well as according to other interesting secondary characteristics (e.g., degree of emotionality). We use this distinction, and the reactions that it received from our reviewers, as a springboard for examining more recent attempts at documenting periods. This examination suggests that at least part of the difficulty that our original study met in being published may have been due to the differences in the goals of autobiographical and standard memory research: standard memory approaches consider underlying representations and processes whereas autobiographical memory, because it is concerned with how people remember their lives, requires consideration of phenomenological perspectives. Although standard memory measures can reveal informative qualities of lifetime periods, understanding how people think about and use periods in their autobiographical memories, requires at least some research that considers memory from the perspective of the rememberer.

Introduction

Today there is growing agreement that extended autobiographical structures (life periods) represent an important organizing component in autobiographical memory. Considering the centrality of "periods" in recent autobiographical theorizing it appears that this focus may in itself represent a new period in the study of autobiographical memory. Before periods came in vogue, we engaged in an intellectual autobiographical period of our own in which we struggled to introduce the notion of periods to the memory research community, regrettably without success. For us, discussions of autobiographical memory inevitably lead to reminiscences about the episodic memory distinction that we developed, researched, submitted (repeatedly), but were until now unable to publish. While we concede that our original data may have been a bit sparse from a traditional perspective, we still believe that the distinction we developed was meaningful and the data informative.

M.A.Conway, D.C. Rubin, H. Spinnler, and W.A. Wagenaar (Eds.), Theoretical Perspectives on Autobiographical Memory, 241-262.

Thus, our experience in attempting to document episodic memory types, is somewhat of a lesson of what happens when theory advances beyond accepted methodology: we knew we had a meaningful distinction, we could show that other people intuitively shared the distinction, yet our methodology was unable to demonstrate our distinctions' value using the scientific criteria of the time.

Since this is a chapter on autobiographical memory, we hope that the reader will be sympathetic to our untraditional quasi-autobiographical approach. Rather than rewriting our original research to incorporate the many subsequent discussions of autobiographical memory types, we will present a slightly abridged version of our earlier theorizing in its original form. By maintaining the original form of the research, we will be better able to convey the next untraditional step in this paper: a sampling of the reviews that led to the rejection of our original manuscript. While paper rejections are typically best kept well hidden in files (if they are not discarded, or worse) we think that in the context of our original research, our reviews may offer some insights about autobiographical memory research: its unique difficulties, perspectives, and goals. We will use this perspective as a springboard for reviewing more recent discussions of the importance of types of autobiographical memories, particularly periods.

Types of Episodic Memories. (An abridged version of Schooler & Herrmann, 1983)

In 1972, Tulving made a distinction between semantic and episodic memory. An episodic memory was described as "a personal experience that is remembered in its temporal spatial relation to other such experiences" (p. 367). Conversely, semantic memory was described as consisting of memories "which do not refer to unique episodes" but rather refer to ". . . general concepts and their interrelation" (p. 387).

Semantic memory is well differentiated. It includes knowledge of vocabulary, grammar, pragmatic rules, phoneme-to-word correspondences, fact memory, and long-term prose memory. In contrast, almost no effort has been made to delineate the types of episodic memory. It is unclear why the concepts of episodic memory have not been subjected to more scrutiny, however, one reason may simply be that episodic memory was historically only considered within the context of encoding and retrieval in laboratory situations. (It would be difficult to produce a life period in a laboratory setting!)

Although Tulving did not subdivide episodic memory into types, he noted that episodic memories can vary in scope. Tulving provided examples of episodes ranging from brief ones like "I remember seeing a flash of light a short while ago, followed by a loud sound a few seconds later" to longer differentiated ones like, ". . . last year while on summer vacation I met a retired sea captain who knew more jokes than any other person I have ever met" (p. 386). Although Tulving observed that episodes may vary in scope, he was ambiguous with regard to the nature of their temporal range. We are told that the

episode with the sea captain represents an "amorphous" experience, but we are not told at what point an amorphous experience becomes a generalization to be held in semantic memory. Meeting the sea captain is an episode, but what about the "summer vacation": is that also an episode? Furthermore, the differences between the experience of seeing a flash of light and the experience (which Tulving presumably intended to describe) of listening to a sea captain tell an endless number of jokes seems more than trivial. Seeing a flash of light seems to pertain to a single incident, while hearing many jokes involves a series of incidents.

Since Tulving's (1972) chapter, several researchers have identified different types of episodic memory. At the simplest level, Brown and Kulik (1977) discussed a very brief type of memory which they termed "flash bulb memories." These memories refer to an event limited in time and surprising in nature. Neisser (1982) also discussed these memories, referring to them as "critical moments." At a somewhat broader level, Linton (1982) has distinguished between events which "may be conceptualized across small or large units of activity" (p.89). She contrasted, as examples of this distinction, "getting a promotion" to "a sustained emotional relationship." Robinson (1976) distinguished between memories for specific incidents, such as an accident; and memories for a "general awareness" of such experiences, such as a job. Thus, both Linton and Robinson conceived of two basic types of memories: one referring to a specific occurrence, and one referring to a more amorphous generalization of many events. Finally, Neisser (1981) identified a general kind of memory, which he termed "repisodic memory," which represents the synthesis of many similar occurrences into an account independent of separate events.

The various types suggested for episodic memory appear to us to constitute three subtypes that follow from two basic distinctions concerning episode representation. The first distinction is between what we will call general and specific episodic memories, and it is equivalent with the distinction made by Robinson (1976), Linton (1982), and Neisser (1981) between memories for specific events and memories for generalizations drawn from a series of events. The second distinction pertains exclusively to specific memories. It differentiates specific memories which are non-sequential from those that are sequential; examples of non-sequential memories are the flashbulb memories identified by Brown and Kulik (1977), and the experience of observing lightning offered by Tulving (1972). Examples of sequential memories include many of the memories for activities noted by Linton (1982) and the example of hearing numerous jokes from a sailor provided by Tulving (1972). These two distinctions (generalized and specific, and in the case of specific memories, non-sequential and sequential) imply three basic episodic memory types: one representing generalization of many events, one representing sequences of specific events, and one representing a single specific event. Memories describing a generalization of events we call periods, since the critical elements of such memories are the general qualities or occurrences which characterize the experiences to which these memories refer. This use of period is consistent with common usage in which the term

refers to an experience of indefinite time, "... distinguished and characterized by the same prevalent features or conditions" (The Oxford English Dictionary, 1970). Memories for sequences of specific events we call episodes. Although Tulving used the term episode to refer to memories of varied scope, the term episodic memory has been used primarily to refer to sequences of events rather than to isolated events or generalizations. Memories corresponding to a single event are referred to here as moments after Neisser's use of this term to describe flash bulb memories.

The possible existence of different types of episodic memories such as the ones described above is an important issue both at the theoretical and at the heuristic level. At the theoretical level, differences between the underlying representation of personal memories could have up to four of the five implications suggested by Tulving (1972), (p. 385) for the semantic-episodic distinction, i.e., episodic memory types might differ: a) "in terms of the nature of the information stored;" b) "the conditions and consequences of retrieval;" c) "their vulnerability to interference resulting in transformation and erasure of store information;" and d) "their dependence upon each other." It is perhaps less likely that they would differ to the same degree as the semantic episodic distinction would be with regard to "autobiographical versus cognitive reference." However, even this distinction might be relevant in that periods may be more likely than episodes to draw on cognitive representations reflecting fixed schemata such as "first love" or "problems with ageing parents".

Consider first how Tulving's implications for the semantic-episodic distinction could apply to periods and episodes. These types of memories can be said to differ in terms of the nature of what they represent about experience, in that period, unlike episodes, describe an abstraction of many events rather than the events per se. The act of retrieval between these two types of memories might likewise differ, with the recollection of periods involving inferential reasoning and the recollection of episodes involving the immediate record of experience. These memory types might also be expected to differ in their vulnerability to retention loss or change; as Linton (1982) so aptly points out: "But while we may forget a birthday or an embrace, we are not likely to forget--ever during our lifetime--a sustained emotional relationship" (p.89). While we may forget or confuse episodes, it is unlikely that we would do the same for periods. Finally, the interdependence of periods and episodes may also differ. One is probably more likely to describe an episode without putting it into the context of a period, than one is to describe a period without providing examples of episodes which occurred during that period.

Similar differences in Tulving's implications for the semantic-episodic distinction may also be found between episodes and moments. These types may be assumed to differ in the nature of the stored information, in that, a moment stands for a single event, while an episode corresponds to a sequence of events. These two types may differ in terms of retrieval, with the remembering of moments depending more on imagery, and the

remembering of episodes depending more on the thematic properties of an experience. These types may also vary in their susceptibility to change, i.e., moments, being limited in scope, may be more susceptible to eluding retrieval; while episodes, being broader in scope, might be easier to locate in memory. Finally, these types may vary in their interdependence, in that, while we may frequently recall episodes without recalling all of the corresponding moments, we are less likely to recall a particular moment without putting it into the context of an episode.

The different theoretical implications just described for moments, episodes, and periods constitute, of course, tentative hypotheses about the nature of episodic memory representation and processes. Even after substantial debate and research there is considerable dispute about whether semantic and episodic memory are separate systems (e.g., Anderson & Ross, 1980; Herrmann & Harwood, 1980; Shoben, Wescourt & Smith, 1978; Schacter & Tulving, 1983). Therefore, theoretical evaluation of any hypothetical distinction is not the first research priority. Instead attention should be given to deciding whether a distinction is useful on heuristic grounds.

Heuristic distinctions of practical are ones which provide a classification scheme that may be of value in research design, (Anderson & Ross, 1980). Two kinds of properties, primary and secondary, should figure in such classification schemes. Primary (non-overlapping) properties are necessary for the consistent identification of memory types. Secondary (partially overlapping) properties are useful in that they indicate the scope of impact which the distinction may have on memory functioning.

The following study investigated the feasibility of a heuristic distinction between three types of episodic memories by examining how primary and secondary properties varied over types. The relationship of hypothetical primary properties and memory types was examined by having one group of subjects produce autobiographical memory descriptions of moments, episodes, and periods. These descriptions were then coded by a second group of subjects according to instructions based on two primary distinctions. (These properties were evaluated by subjects other than those who generated memories in order that the properties would be objectively based): 1) whether a given memory represented a general or specific experience; and 2) in the case of specific experiences, whether the memory described a single event or a sequence of events. Several secondary properties were also investigated for their possible correlation with moments, periods, and episodes. These secondary properties included the duration of the experience, the age at the occurrence of the experience, abstract-concreteness, pleasantness, emotionality, and life change resulting from the experience. These properties were selected because it was believed that they might elucidate the differences between types and because they might be expected to influence the processing of autobiographical memories.

Two secondary properties, age at and duration of the experience, were estimated by the subjects providing the memory. (Duration and age were provided by the subjects who generated memories because of the factual nature of these properties.) The age at the time of an experience might be expected to increase across moments, episodes, and periods, since episodes, and even more so, periods, may require a more mature mind for encoding. The duration of the experience was believed to increase in a more striking fashion since generally more time is needed for the occurrence of a series of events (episodes) than a single event (moment) and even more time for the occurrence of enough events to warrant the drawing of a generalization about experience (period).

Four more secondary properties, abstract-concreteness, pleasantness, emotionality and degree of life change were rated by a third group of subjects. (The secondary properties were assessed by a different group of subjects than the primary properties in order to reduce the degree to which subjects judgments of specific memories might have been influenced by their beliefs about different memory types). Moments and episodes were expected to be less abstract than periods because periods were believed to be generalizations while moments and episodes were hypothesized to represent specific events. Pleasantness was expected to increase across the types on the assumption that the encoding of episodes, and more so of periods, entails omission of some aspects of original experience, particularly unpleasant ones. Both emotionality and life change were expected to separate the three types. Memories have been assumed to be especially emotional in nature either when the memory is a moment (see the discussion of "flashbulb memories by Brown and Kulik, 1977) and when it is a period (see the discussion of "events conceptualized over large units of time" by Linton, 1982). Life changes were predicted to be reflected the most in periods, since these memories presumably have the greatest scope. Finally, it is important to point out that a monotonic increase or decrease in secondary properties would favor the hypothesis, that the three types reflect a common underlying property that is continuous rather than trichotomous. On the other hand, the finding of inconsistent patterns of increase and decrease between the three types would indicate that these three types may not be explained simply on the basis of a common underlying dimension.

Method

Subjects: Forty-eight undergraduates from Hamilton College and Colgate University participated in this study.

Procedure: Eight subjects each recalled two instances for one of three hypothesized types of episodic memory (moments, episodes, or periods) and indicated the duration of and their age at the occurrence of each experience. The instructions specified only the name of the memory types; neither the definition nor an example of the type was given.

The forty-eight memory descriptions provided by the twenty-four subjects were

typed verbatim with the exception that phrases containing the terms moment, episode and period, were removed. These typed descriptions were presented in a random order to twelve subject-judges. These subject-judges were given written instructions which defined three types of memories: general memories that represent a generalization about past experience; sequence memories that represent implicitly or explicitly a specific succession of smaller events; and singular memories that represent specific single events which cannot be broken down into smaller memories. The instructions asked subject-judges to indicate which of these three memory types was most appropriate for each memory on the list, with the restriction that exactly 16 memories were to be identified for each type. The instructions did not mention the terms moment, episode, or period, in order to keep subject-judges from classifying memories on the basis of the temporal properties of the memories. The instructions were designed to keep the subject-judges attention on the presence or absence of generalization and of sequencing. No examples were given for the three types of memories to avoid biasing of subjects' judgements.

The forty-eight memory descriptions were also presented to another twelve subject-judges. These subject-judges were given written instructions to rate each memory description on a seven-point scale for each of four property dimensions: abstractness (concrete-abstract); emotionality (not emotional-very emotional); pleasantness (unpleasant-pleasant); and effecting a change in one's life (no life change-major life change). Responses to each scale were assigned a score from one to seven with the lowest rating on a dimension being scored as a 1 and the highest rating being scored as a 7.

Results

The appendix includes examples of the descriptions of experiences recalled by subject in each of the three recall conditions: moments, episodes, and periods. Qualitative

Table 1.

Percentage of primary qualities coded across different description types.

	Type of memory requested from subjects		
Primary quality rated by subject judges	Moments	Episodes	Periods
Singular	<u>67%</u>	29%	5%
Sequence	29%	<u>55%</u>	14%
Generalization	4%	16%	<u>81%</u>

comparison across recall conditions suggests that each condition elicited descriptions that were qualitatively different from the other conditions. (Note in the original manuscript we included all of the descriptions)

The results for the classification of primary properties are shown in Table 1. (Note that, in Table 1 underlined percentages represent those classifications which agree with a priori hypotheses about the primary properties of memory types). Table 1 presents the mean percentages of moments, episodes, and periods which were classified as a singular, sequential, or general. Analysis showed that the classifications made by the judges agreed substantially with a priori expectations. As described earlier, it was hypothesized that moments would be classified as singular, episodes as sequences, and periods as generalizations. The cases in which judges agreed with a priori expectations are given on the diagonal of the table. These expected classifications are the largest in the table. When compared with a chance classification rate (33%), expected classifications were found to have occurred significantly more often than chance for all memory types: moments t (1,11)=6.857, p.001; episodes t (1,11)=3.52, p<.01; periods t(1,11)=12.29, p<.001. A separate analysis showed further that the magnitude for the expected classifications differed for the three types, F (1,12) = 15.67, p<.001. Simple effects tests indicated that there

Table 2.

Secondary properties of memory description.

	Type of memory requested from subjects			
Secondary properties rated by subject judges	Moments	Episodes	Periods	*p-value*
Mean age during experience	14.8 years	14.2 years	13.5 years	n.s.
Mean duration of experience	12.6 min.	8.8 days	179 months	p<0.001
Concrete-abstract*	3.25	3.65	4.17	p<0.05
Unpleasant-pleasant*	3.11	3.72	4.25	p<0.05
Not emotional-emotional*	5.62	4.54	5.31	p<0.05
No life change- major life change*	4.01	3.68	5.25	p<0.05

*Numbers in each row represent the mean ratings of memories for the property on the scale indicated. The first term in a property pair received a value of 1 and the second term a value of 7 with intermediate values ranging from 2 through 6.

were more expected classifications for periods than for episodes and moments, as well as more expected classifications for moments than for episodes, $p<.05$. In the case of unexpected classifications, moments were judged more frequently as sequential than general memories, $t\ (1,11)=6.23$, $p<.001$, periods were more often judged as sequential memories than singular memories, $t\ (1,11)=4.05$, $p<.01$, and episodes were more often judged to be singular memories than general memories, $t\ (1,11)=3.36$, $p<.01$.

The mean secondary property ratings are presented in Table 2, above, as a function of kind of secondary property as rated by subject judges and type of episodic memory as elicted from subjects. The mean age of subjects at the time of occurrence did not significantly differ for moments, episodes, and periods $F(1,23)<1.0$. There was a significant difference between the means of subjects estimates of the duration of recalled moments, episodes and periods $F(1,23)=42.81$, $p<.001$.

Since the remaining properties were evaluated by a different group of subject-judges than those who generated the age and duration of memories, the remaining properties were analyzed separately. In order to statistically evaluate whether these remaining properties all vary monotonicaly, the remaining properties were analyzed in a single ANOVA. The purpose of this analysis was to assess possible interactions between the kind of rating, the type of memory. This analysis showed that kind of rated secondary property interacted with episodic-memory type, $F(1,11)=9.23$, $p<.001$. Simple effects tests showed significant (1) increases in abstractness between moments and periods and between episodes and periods, (2) increases in pleasantness between moments, episodes, and periods, (3) decreases in emotionality between moments and episodes and increases between episodes and periods, and (4) increases in life change between episodes and periods ($p<.05$ for all comparisons).

Discussion

The results showed that memories of a particular type were perceived by raters in a manner consistent with the properties hypothesized to be possessed by each memory type. Periods were usually judged to represent generalization, episodes to represent sequences, and moments to represent singular events. The consistent attribution of property types illustrates the feasibility of distinguishing types of episodic memories.

It is noteworthy that the highly consistent ratings for primary properties were obtained with untrained subject-judges who received no examples during instructions. Thus, the high agreement between raters and a priori expectations cannot be attributed to having biased the raters, by training or examples, in the manner consistent with hypotheses about the primary properties. Indeed, the agreement shown in Table 1 very likely underestimates the level of expected classifications since some of the responses generated by the first group of subjects actually represented one of the other types.

The data for the self-rated secondary properties also exhibited clear differences among the three episodic-memory types. Consider first the duration of experiences as estimated by the subjects who generated the memories. As shown in Table 2, there are marked differences in the localization in time of moments, episodes and periods, even though the ages of subjects were comparable across memory types. These differences in experience duration are not surprising given the primary properties of the three memory types; episodes tend to be longer than moments since episodes are a series of moments; periods tend to be longer than both episodes and moments since they represent generalizations that are usually based on more than one episode. While we did not measure spatial extent underlying original experience, it seems reasonable to assume that use of space increases across moments, episodes, and periods. We belabor this point because episodic memory is frequently defined as a memory that is localized in time and space (Tulving, 1972), giving the impression that episodes are points on temporal and spatial coordinates. The results for duration of experience indicate that the localization in time (and surely in space) varies tremendously over episodic memories.

The rated secondary properties (shown in Table 2) also differed with episodic-memory types. These differences further indicate that these types provide a useful scheme for classifying episodic memories. Furthermore, the interaction of kind of secondary property and type of episodic memory in the rating has an important implication. Specifically, the observation that one of the variables (emotionality) did not change monotonically indicates that the differences between moments, episodes, and periods are not simply due to a single underlying variable, e.g., the duration of experiences.

It might be argued that duration, a single property, is either the primary property underlying the episodic-memory types, or else it is another primary property in addition to the ones already discussed. We will consider this latter hypothesis first and then evaluate the former. For both duration and the previously described properties to be primary, they must correlate perfectly; but it is clear that they do not; e.g., a generalization may be stored for something as brief as a kiss, a sequence might be compact or protracted, and a moment may extend as long as no boundary is set on an experience. Since the correlation is not perfect, a choice must be made about which constitutes the primary properties. The solution to this problem lies in the plausibility of hypotheses about primary properties. First, we note that duration as a concept makes no implications about the number of episodic memory types, whereas, the general/specific, sequence/non-sequence dimensions directly imply three types. Second, duration alone makes no implications about the nature of representation (singularity, sequence, or generalization), whereas the alternative (general versus specific experience, nonsequential versus sequential nonspecific experience) distinctions implies these representational properties straightforwardly. We believe that the relationship between time and the registrations in memory of moments, episodes, and periods is correlational, not casual. As duration increases, experience is more likely to be thought of as a moment, then as an episode, and finally as a period, not because of time

per se but because the increased opportunity provided by increased time for encoding sequences and generalizations.

Regardless of the view one takes on the primary properties underlying types, the present results suggest that distinguishing episodic-memory types may be heuristically useful to research on autobiographical memory. For example, in recent years, many studies have investigated autobiographical memory in general (Robinson, 1976; Rubin, 1982). Since not all episodic-memory types are equally likely to be recalled (Robinson, 1976), conclusions about recalled memories may apply more to one kind of memory than to autobiographical memory in general. In addition, the emphasis in autobiographical memory research has been, not surprisingly, on the episode. The episodic-memory distinction makes it clear that a full account of autobiographical memory requires greater research attention to moments and periods.

A limitation of the heuristic value of the present results is that they deal exclusively with memory performance of students between 18 and 22 years old. It is possible that older people may have different values for some properties of memory types. For example, older subjects may have memories that may even deserve to be called an era rather than a period (one pilot subject, 18 years old, objected to being asked to recall eras because she had not lived long enough to have experienced an era, whereas, an older pilot subject, about 65 years old, recalled periods much longer than recalled by subjects in the present study). Thus, the precise values of properties reported here may not be applicable to older adults. While age differences in property values do not nullify the heuristic implications, such differences will be important in understanding the processing of types by various age groups.

A second limitation of the present results is that the primary and secondary properties of episodic memory types constitute the reactions of subject-judges to descriptions of experience. The data per se do not deal directly with properties of memory representation. Conclusions about whether the present results pertain to memory representations as well as to memory descriptions must await research concerning the relationship between performance (speed, accuracy) and the properties discussed here.

If future research does demonstrate the existence of separate representation or access of episodic memory types, a new conception of episodic memory may be necessary. As Neisser (1982) pointed out, "...Our lives are laid out behind us in a richly structured way, full of landmarks and stages and critical moments" (p.47). If this hypothesized structure is borne out by further research, it will no longer be possible to view all autobiographical memories as represented in memory in the same way or all autobiographical memory retrieval as a simple "stroll down memory lane." A person's past would be understood as being represented in different ways according to what the person, knowingly or unknowingly, chooses to extract from experience. Similarly, autobiographical memory

retrieval would be understood as varying according to whether a person, knowingly or unknowingly, sought to recall at the level of a generalization, a sequence of events, or just a single event.

It might be argued that the differentiation of episodic-memories into types, regardless of heuristic utility or theoretical viability, is undesirable, since it violates parsimony. It has been suggested that anything other than a dichotomy (such as the semantic-episodic distinction) would be too cumbersome as a classification scheme for long-term memory (Schacter & Tulving, 1982). We agree that the major classification of long-term memory is presently best described by the dichotomy proposed by Tulving (1972). We note further that the present proposal contains nothing that conflicts with the semantic-episodic distinction, since the suggested memory types are nested within episodic memory. It is obvious, however, that the present proposal acts to increase the number of memory types. In that semantic memory is well differentiated into several types of information, it seems to us that the conceptualization of episodic memory could also benefit heuristically, and perhaps theoretically, from being differentiated. It is well accepted that if a classification scheme is too simple or too complex, it is limited in its utility. We believe that the small increase in complexity necessitated by episodic-memory types does not limit the utility of current taxonomies of long-term memory. Instead, these types add new ways to study episodic memory, ways that enable more accurate accounts of episodic memories involved in an investigation.

The reviewers' response. Our attempt to demonstrate the importance of distinguishing between moments, episodes and periods received mixed and ultimately negative reviews from two journals. The reviewers were sympathetic to the distinctions that we were making, suggesting that our research provided a starting poing for the conceivably important topic of the subclassification of episodic memories. However, they had mixed reactions to our methodology. One positive reviewer argued that subjects' ability to distinguish between our proposed types of memories, with respect to both generation and categorization, implied that the distinction was not arbitrary. However other reviewers were more critical of our data, suggesting that our evidence really only tested peoples' semantic definitions. Ultimately, our demonstration that people could naturally distinguish these memory types was simply not persuasive enough to convince the reviewers that the distinction was theoretically meaningful. In short, they liked the idea but felt the data were insufficient.

Reflections on the fate of our manuscript. Since our unsuccessful attempts in 1983 to document episodic memory types, and in particular memory periods, at least ten discussions of memory periods or their equivalents have been published (i.e., Brown, 1990; Brown, Shevell & Rips, 1986; Barsalou, 1988; Conway & Bekerian, 1987; Huttenlocher, Hedges, & Prohaska, 1988; Linton, 1986; Neisser, 1986; Reiser, Black & Abelson, 1985; Robinson, 1986). Indeed, in a recent review of emerging directions in

autobiographical memory research Robinson & Swanson (1990), discussed recent considerations of "large-scale event structures in autobiographical memory which integrate thematically related events over time" (p. 325), what we would call periods. They concluded that "this topic seems to us to be one of the richest for further study" (p. 325). Thus, current consensus suggests that the issues that we were raising were important ones.

If the issues we were considering were important, then the question arises why did our research encounter such difficulty in being published? Obviously, the difficulty lay with the manner in which we attempted to demonstrate the memory types. This difficulty likely reflects, in part, our lack of ingenuity in applying standard research procedures (e.g., priming, date estimation) to periods. As will be discussed, subsequent researchers have had some success with these approaches. However, such standard cognitive measures are not completely satisfying when it comes to documenting characteristics of autobiographical memory. Intuitively, it seems that there is much more to periods than to simply serve as effective primes for episodes (Conway & Bekerian,1987) or to provide sign posts for estimating dates (Huttenlocher et al, 1988; Brown et al, 1986; Robinson, 1976). Our data suggested that periods represent rich memories, whose unique attributes are not adequately captured by simple measures.

Our difficulty also may have resulted from the differences between the goals involved in understanding autobiographical memories and those of more traditional memory research. Standard memory research uses measures such as accuracy and response time, in order to reveal implicit constructs such as memory strength, organization, and representation. The actual experience of remembering is not considered important in itself except to the degree that it can reveal underlying memory processes. The goals of autobiographical memory research are somewhat different, in that it is concerned with how people understand their past. The memory recollection is itself important because it represents what an autobiography is. The fact that people possess and recognize memory periods may not provide a compelling empirical extension of the processes of episodic memory with in the context of basic memory research. Nevertheless we still maintain that it represents a meaningful documentation of an important component to autobiographical recollections.

In essence, we shelved our research because the issues that we were concerned with (i.e., the qualities of subjects' recollections of these different memory types) did not lend themselves to research using traditional approaches. As will be shown, examination of more recent discussions of memory periods illustrates the tension between considering life periods as a basic memory representation (the traditional approach) versus a way in which people understand their past (the phenomenological approach that we attempted). We acknowledge that the distinction between standard and phenomenological memory approaches is somewhat vague, indeed it may represent (much like day and night) two ends of a continuum. Nevertheless, meaningful distinctions may be made. Standard memory

studies typically involves consideration of one or two readily quantifiable dependent measures (e.g., accuracy, or reaction time). They are typically published in refereed journals, and usually have relatively little to say about the qualitative characteristics of the recollections they are measuring. In contrast, the phenomenological approaches, rely on memory narratives or simple introspection, are usually published as non-refereed book chapters, and are generally much richer in their speculations about the experience of the memory recollection. A better understanding of the distinct contributions of these two approaches can be seen by comparing how the traditional and phenomenological approach have been recently applied to the now popular issue of memory periods.

Recent Evidence for Periods Using Standard Memory Measures

One source of standard psychological evidence for periods comes from date estimation studies that use traditional measures such as frequency, accuracy, and reaction time. Robinson (1986) examined the number of events that subjects recalled when cued with different months of the year. He observed that subjects retrieved more events for months that occurred at the end of school terms (e.g., May, August, and December), than the middle, with a similar though less pronounced rise at the beginning of the term. Robinson's findings suggest that periods may play a role in autobiographical memory organization, with end points providing particularly useful retrieval cues. Of course it is also possible that his findings have little to do with memory organization but rather reflect the characteristics of the school year; i.e., more memorable events may occur at the ends of terms.

A more recent study of the relationship between event dating and periods, avoided some of the biased sampling problems of Robinson study. Huttenlocher et al examined the effects of periods on the dating of events that the experimenters both identified and were able to accurately date: movies shown on campus. Huttenlocher et al (1988) similarly observed that school term periods (e.g., fall term) can serve as boundaries for dating events (movies seen). However, in their study, people tended to produce date estimates toward the middle of the term, causing underestimation for events at the beginning of the term, and overestimation for events at the end of the term. They conclude "...the boundaries of higher level units lead to a bias a the ends of bounded intervals..."(p. 482). Thus their study suggests that people are able to locate memories within periods, and having done so, tend to date events as occurring towards the middle of the interval (i.e., the period) within which the event is estimated to occur. The results of Huttenlocher et al may seem superficially inconsistent with those of Robinson (i.e., in the former case there was a bias towards the middle of the term, while in the latter the bias was towards the ends). However, it should be kept in mind they used different standard memory measures: Huttenlocher et al measured errors in dating while Robinson measured frequency of events recalled as a function of date. It seems reasonable that the temporal boundaries of periods would have different effects on different tasks.

Another standard memory measure that has been successfully applied to period research is reaction time. For example, Brown (1990) (originally cited in Brown, Shevell & Rips, 1986) observed that subjects were faster to classify public events in the context of public periods (Carter's vs Reagan's presidency) than personal periods (high school vs. college). He concluded that "historical periods exist as units in memory and that they are readily accessible from some events but not others" (p. 304). Another application of reaction time measures to period research was conducted by Conway & Bekerian (1987). They measured the speed with which subjects generated autobiographical memories in response to either life period or semantic primes. They found that life periods (e.g., school days) speeded retrieval of autobiographical memories generated in response to personal cues (e.g., holiday in Italy). In contrast, non-personal memory primes (e.g., semantic categories) had no effect on retrieval time. They concluded that periods provide effective primes because they "constitute a category that, in an abstract way, summarizes general aspects of an individual's autobiography" (p. 130). A more rigorous test of this hypothesis would be the demonstration that periods prime episodic memory retrieval more than other types of personal memory information, e.g., different episodes. Nevertheless, the demonstration that periods can serve as effective episodic memory primes is consistent with Conway & Bekerian's hypothesis that periods represent a basic underlying organizational representation for autobiographical memory.

In sum, the standard memory approach has offered valuable demonstrations of the role that periods may play in organizing autobiographical memory. Measures of frequency of recalled events suggest that period end points may provide particularly useful retrieval cues. Measures of dating accuracy and speed suggest that periods may offer brackets within which dates can be estimated. Measures of reaction time suggest that periods provide useful primes for autobiographical memories. While these findings help to illustrate the organizational role of periods, they fail to tell us what periods are. What situations, themes, etc., define a period, what are its characteristics, etc. In the context of standard memory research paradigms even when such data are collected it is rarely given much attention. For example all but one of the above studies defined periods themselves (e.g., school term, etc). The one study that elicited periods (Conway & Bekerian, 1987) from subjects did not do a formal analysis of those periods (Actually, the reviewers insisted that the qualitative analyses of periods be dropped from the manuscript, personal communication, Conway, 1991) . Since autobiographical memory seems to beg the question of how one remembers one's past, we now turn to more phenomenological discussions of life-time periods.

The Phenomenological Approach to Memory Periods

Neisser (1986) aptly captured the critical phenomenological characteristics that need to be identified in order to develop an understanding of autobiographical memory. He noted:

The study of any kind of memory properly begins with a description of the material that is to be remembered. In the case of autobiographical memory the material consists of events that we have experienced- or, to put it another way, of our personal experience of events. But what is an event? How are events experienced? (p. 71).

In short, the personal nature of autobiographical memory implies that an understanding of autobiographical memory requires taking the perspective of the rememberer. From this phenomenological perspective of autobiographical memory, Neisser quickly concluded that one of its fundamental characteristics is its nested quality; i.e., "...events defined at one level of analysis, may themselves be constituents of other, larger events" (p. 71). Reflecting on his own experiences, Neisser made a number of observations about these larger units of memory, what he termed "extenditures", that create the nested structure of autobiographical memory. He noted, for example, that recalling an experienced event does not simply entail remembering a single record, but rather involves moving between nested levels of structure. He further observed that the influence of extenditures can be gradual since one does not always realize when a new extenditure has begun. Of particular relevance to the study presented earlier is Neisser's speculation about the relationship between isolated events (what we would call moments) and extenditures (what we would call periods). He suggested that these isolated events may actually be used to "...stand for an entire extenditure" (p. 79). In other words, critical moments may epitomize the unique qualities of a whole period. While one might wish to pursue these speculations more empirically, such speculations, with their focus on the remembers perspective, seem beyond the scope of the standard research measures.

Linton (1986) provided an excellent example of the insights about periods that can be revealed from a long-term phenomenologically oriented research approach. Linton focussed exclusively on her memory for the events from her life. Her analysis of her memory for past events has involved a variety of different measures ranging "from the open ended to the narrowly restricted" (Linton, 1986, p. 52). Her basic approach was to regularly record events from her life and then test herself at later times. Some of her measures neatly fit with the rigourous controled measures of standard approaches, for example she methodically analysed the accuracy of the content and dating of her memory reports for events that occurred over a number of years (Linton, 1975). However, other measures such as unconstrained free recall of the events of an entire year, allowed phenomenological insights not revealed by the more restricted measures. Combining her insights regarding the strategies she used to organize these unconstrained recall of life events, along with general introspections regarding their nature and relationship to other memories, Linton developed a general hierarchical outline of memory categories. This categorical approach has much in common with our notion of moments, episodes, and periods. For example she identified "events and episodes" which are "representations of self-contained sets of actions, occurrences, and so on, that have independent coherence." (p. 58). At a higher level of abstraction, she described extenditures which are equivalent to

our periods and are "...sets of memories loosely bound by the coexistence of some significant persistent orientation" (p. 57). Drawing on these phenomenologically based distinctions, Linton made some interesting observations about how extenditures have influenced her unconstrained recall of events. For example, when trying to recall events that occur within the last year, she rarely relied on extenditures. However, as she tried to recall events that occur over longer durations, her reliance on extenditures (periods) became more and more common. Moreover, the extenditures increasingly influenced what she could remember. "Events locked into larger units (extenditures) are retained. Isolated events have a high probability of being lost" (p. 64-64). Thus, using a more phenomenological approach, Linton was able to embellish the notion of periods in ways that are inaccessible to the more standard approaches.

Another phenomenological approach to periods was described by Barsalou (1988) who did a qualitative analysis of subjects' descriptions of their summer vacations. He found that relatively few recollections were of specific events (what we would call episodes). Instead the great majority were more abstract: summarized events, describing a repeated activity, and extended events, describing events that last longer than a day. Barsalou went on to qualitatively analyze the organization of subjects' recollections. He found that rather than describing their memories in chronological order, subjects follow the organization of extended events. Drawing on this finding, as well as his own intuitions, Barsalou suggested that hierarchically organized "...extended-event time lines are the primary organizers of autobiographical memory" (p. 218). Barsalou's time lines are hierarchically organized periods such as "school", "high school", "junior year", etc. He further conjectures that periods may be interrelated by goal attainment. For example, the "school" time period fulfills the goals necessary to move to the first job period. From a standard memory research perspective, Barsalou's discussion seems to go far beyond his analysis of subjects memories for their summer vacations. Nevertheless, because he took the liberty to make some phenomenological speculations about periods, he offers us a variety of insights that might have otherwise been overlooked.

Conclusions

Consideration of our original research on episodic memory types from the perspective of the research that followed it clarifies some issues that we did not fully appreciate at the time. Originally, we were convinced by the reviewers that our methodology was weak. While we still concede that our methodology was weak from a traditional memory research perspective, we now believe that some of the critical issues that we were concerned with were not accessible to traditional approaches. Thus, our difficulties may have been neither due to the quality of our theorizing nor to the quality of the methodology we used to justify it. Rather, our inability to find sympathetic reviewers may have occurred because of the inconsistencies between the goals and methods of basic memory research and those of autobiographical memory. Indeed, this would not be the

first time that the goals of different approaches to memory research came in conflict (see Herrmann & Chaffin, 1988). Although autobiographical memory in general, and memory periods in particular, can be successfully explored using basic research methods, many critical issues seem to defy such methods, and rather require a more phenomenological perspective. When researchers (including us) apply a phenomenological perspectives to the issue of periods, advances are made. However these advances do not seem to be the sort that get published in refereed journals. Rather they wait to be published as invited book chapters. Although we did not realize it at the time, we were engaging in a type of research that would require a few periods to pass in our own lives before the opportunity to publish would occur. Perhaps the times are changing and greater flexibility with respect to the nature of what is acceptable sources of data is at hand. If not, then the discussion of important phenomenological areas of autobiographical memory research may be off limits to theorists not fortunate enough to be invited to write book chapters.

Although we wish to promote the value of a phenomenological perspective, and the importance of personal memory narratives in understanding autobiographical constructs such as periods, two caveats are in order. First, we do not want to suggest that such phenomenological sources necessarily reflect underlying representation or processes. Indeed, there is now considerable evidence documenting the lack of correspondence between verbal reports and underlying cognitive processes (e.g. Nisbett & Wilson, 1975). Research by one of the authors suggests that attempting to explain phenomelogical experiences can actually disrupt certain non-verbal cognitive processes (Wilson & Schooler, 1991). Indeed it is possible that introspections about periods may also disrupt certain types of memory retrieval. For example, consideration of the periods in ones life may interfere with accessing episodes inconsistent with the themes of the period (e.g., Linton, 1986; Greenwald, 1980). However, even if retrieving periods distorts our memories of the past, and even moments may not always be veridical, they seem to be what we often remember. In short, to the degree that autobiographical memory is concerned with how people remember their lives, then we must be concerned with the autobiographical memory experiences themselves as imperfect and non-reflective of underlying processes as they may be.

The second, equally important caveat, is that while existing phenomenological approaches have been informative, new techniques need to be developed. The apparent bias against the phenomenological perspective by standard journals has likely discouraged the use of this approach. (We can only wonder what other phenomenologically oriented autobiographical memory investigations are tucked on shelves like ours). Clearly, there is much room for improvement. For example, in the case of periods, it would be very helpful to conduct formal analyses of the autobiographical recollections of older people who have had the opportunity to form many periods, and who may have distinct insights into what makes a period meaningful. Only through the refinement of existing phenomenological approaches and the development of new techniques, will researchers be

able to adequately address the critical autobiographical memory issue of characterizing how we experience our memory for the past.

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