PROPERTIES OF WORD CUES FOR AUTOBIOGRAPHICAL MEMORY¹

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Summary.—A sample of 124 words were used to cue autobiographical memories in 120 adults varying in age from 20 to 73 years. Individual words reliably cued autobiographical memories of different ages with different speeds. For all age groups, words rated high in imagery produced older memories and faster reaction times.

In 1974, Crovitz and Schiffman modified a technique originally devised by Galton (1879) to sample the contents of his own memory. Crovitz and Schiffman used words to cue personal, episodic, autobiographical memories from undergraduates' lives. This method has since been used extensively to study autobiographical memory (see Rubin & Schulkind, in press a, b, for a review). One issue that has been studied is the relation between the properties of the cue words and the autobiographical memories retrieved (Rubin, 1980, 1982). Here we extend this research to adults varying in age from 20 to 73 to see if properties of the word cues lead to differences in the latency to produce an autobiographical memory, the age of the episode produced, and the period of life from which the episode came.

METHOD

Participants

Six groups of 20 participants each took part. Two groups were comprised of 20-yr.-old Duke University undergraduates who received either credit towards their introductory psychology participation requirement or \$5.00 per hour. One group of 35-yr.-old participants, one group of 70-yr.-old participants, and two groups of 73-yr.-old participants were contacted through the Subject Register of the Center for the Study of Aging and Human Development at Duke University Medical Center. They received \$10.00 per session. Participants had their 20th, 35th, 70th, or 73rd birthday between 1 and 11 months prior to testing. For more details on the participants and procedures see Rubin and Schulkind (in press b).

Procedure

The participants were tested individually. Each participant was asked to provide one event for each of 124 cue words. The words, which were taken

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from 125 words previously normed on 51 properties (Rubin, 1980), were presented in a different random order to each participant. Participants worked at a desk facing a wall so that the experimenter was out of sight. The participants recorded a brief description of their memory, and reaction times were recorded from the end of the reading of each word until writing began on a memory. After all 124 cue words had been presented, the participants were asked to return to each of their descriptions and date it using a month, day, and year.

RESULTS

To obtain a value for the average reaction time for each word for each of the six groups, the arithmetic mean of the response to that word of everyone in the group was used. To obtain a value for the average age of the remembered episodes for each word for each of the six groups, the geometric mean was used. Values from groups of similar ages correlated about as highly as their reliabilities, indicating minimal differences among groups of the similar age. Therefore to increase reliability, all 40 20-yr.-old participants were combined into one group and all 60 70- to 73-yr.-old participants were combined into another, and new reaction-time and age-of-episode measures were calculated. To examine memories from various periods of the older adults' lifespans four measures were formed for each cue word from the combined 70- to 73-yr.-old group indicating the proportion of times that a cue word produced a memory that fell in childhood (0–9 years), early adulthood (10–29), middle years (30–49), or older years (50–69).

The means and standard deviations and the correlations between these autobiographical memory measures and several independent variables for the combined groups are shown in Table 1. The independent variables are imagery, concreteness, and meaningfulness from Paivio, Yuille, and Madigan (1968), goodness and emotionality from Brown and Ure (1969), and the base ten logarithm of word frequency from Kučera and Francis (1967). These independent variables were reported because they were successful predictors of autobiographical memory variables or were prototypical of factors from Rubin (1980) that were not successful predictors, e.g., goodness, emotionality, and frequency. Table 1 also contains the reliabilities of these measures using Cronbach alpha (α), or for data from published sources, whatever statistic was provided. The reliabilities estimate how well each measure would correlate with a replication, and thus what the variables' maximum correlation should be with other variables.

The reaction-time measures correlated among themselves from .45 to .57, and the age-of-episode measures from .41 to .50, nearly as highly as the reliabilities given in Table 1. Reaction-time measures correlate negatively with the age-of-episode measures, from .02 to -.51, indicating that there is a

TABLE 1
CORRELATIONS AMONG AUTOBIOGRAPHICAL MEMORY MEASURES AND PREDICTORS

Predictors	α	<i>M</i>	<i>SD</i>	Autobiographical Memory Measures											
				Age of Episode			Reaction Time			Periods of Life, yr					
				20	35	70	20	35	70	0-9	10-29	30-49	50-73		
Imagery	.94	5.56	1.30	.34	.09	.25	-.37	-.50	-.67	.29	.22	.28	.05		
Concreteness	.94	5.25	1.98	.38	.07	.28	-.36	-.50	-.65	.33	.18	.28	-.02		
Meaningfulness	.94	6.50	1.04	.47	.13	.29	-.43	-.52	-.64	.16	.14	.33	.14		
Goodness	.98	4.61	1.29	-.02	-.15	.01	-.01	-.19	-.06	.12	.19	-.06	-.02		
Emotionality	.95	3.69	1.38	-.05	.07	.00	.09	.15	.20	-.25	.11	-.02	.02		
Frequency		1.62	0.66	-.32	-.19	-.03	.18	-.12	.13	-.03	.18	.04	-.05		
α				.81	.72	.85	.71	.45	.75	.71	.65	.51	.80		
<i>M</i>				230	87	776	11.6	17.0	18.9	.06	.15	.10	.56		
<i>SD</i>				195	104	893	3.2	7.3	5.4	.05	.07	.06	.11		

Note.—Age of Episode is the geometric mean age of the events in days. Reaction Time is the mean reaction time in seconds; 20, 35, or 70 refers to the approximate ages of the participants. The predictor variables are described in detail by Rubin (1980). α refers to Cronbach alpha. All means and correlations are based on an *N* of 124.

tendency for words that cue older memories to do so with shorter latencies. In general, as shown in Table 1, imageable, concrete, and meaningful words cued autobiographical memories with shorter latencies and cued older autobiographical memories. This agrees with earlier studies (Fitzgerald & Lawrence, 1984; Rubin, 1980). The relationship of concreteness and imagery with reaction time in part results from abstract words having long retrieval times. When the memories are broken down by when they occurred, the proportion of memories from 0 to 9 years of age and from 30 to 49 years of age correlated moderately well with imagery and concreteness. This finding is consistent with concrete, sensory, easy to learn concepts predicting earlier memories (Rubin, 1982; Rubin, Groth, & Goldsmith, 1984) and with the general correlation obtained here between imagery and concreteness and the age-of-episode measure.

DISCUSSION

The properties of autobiographical memory calculated here for each word are reliable variables that act in consistent and reasonable ways, changing little with the age of the participant. Thus, at a theoretical level, the memory processes do not seem to change drastically with age and do appear to depend on the sensory properties of the cues. The results are also useful at a more applied level. To minimize the number of cases in which a person fails to produce an autobiographical memory, word cues should be selected which have properties that lead to shorter reaction times. These same properties should also lead to older memories in adults ranging from 20 to 73 years of age. No properties of words were especially good at predicting

which words would produce memories that came from the early adulthood of older participants, even though many more memories come from this period than expected from a monotonic forgetting function (Rubin & Schulkind, in press a, b).

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