Age and Knowledge of Historical Facts

Michael J. Gilewski & Elizabeth M. Zelinski

University of Southern California

Larry W. Thompson

Palo Alto VA Medical Center

K. Warner Schaie

Pennsylvania State University

Studies investigating recall or recognition of facts about people or events associated with time periods from most recently to 60 years ago report conflicting findings about the existence of an age x period interaction. One source of the discrepancy in results may be the nature of the instrument used. Previous studies have not systematically sampled items, which may contribute to the variability in results. The present investigation attempts to overcome this limitation by employing a test that includes parallel items for all periods tested. Results with this instrument show an age x period interaction, but the period associated with best peformance coincides with the time from just before subjects were born through young adulthood.

Botwinick and Storandt (1974) constructed a 24-item recall test of historic events. Items represented four 20-year periods from ranging from 1890 to 1969. While there were no age differences between young and old subjects, there was a significant age x period interaction. Botwinick and Storandt argued that the interaction was due to peak recall on items referencing events taking place when an individual was between the ages of 15 and 25. For instance, the age/period peak for a 60 year old in 1970 would have been 1935, when the individual was 25 years old.

Other studies report more ambiguous results. Storandt, Grant, and Gordon (1978) examined recall for entertainment events as well as historical incidents. They found an age x period interaction, but the age/period peak was for events experienced from age 10 to 40. They noted that the age/period peak was earlier for more remote events. Botwinick and Storandt (1980) examined news and entertainment items in another study employing both recall and recognition

of the events. The age/period peak ranged from events occuring from age 9 to 32
for entertainment items through the 1950's. For more recent events, a similar
range of age/period peak was observed for recall, but middle-age was the peak on
recognition. The age/period peak was 1 through 20 for historical events, except
for recent items, where middle-age was the peak for both recall and recognition
tests.

Some studies have simply found that older age groups remember older
information better than do younger adults and that younger adults remember more
recent information better than the elderly, but no real age/period peak exists
(Bartlett & Snelus, 1980; Perlmutter, Metzger, Miller, & Nezworski, 1980; Poon,
Fozard, Paulshock, & Thomas, 1979; Squire, 1974). Other studies have found
better recall for more recent events than past events for all individuals
regardless of age (Sanders & Warrington, 1971; Squire, Chace, & Slater, 1975;
Squire & Slater, 1975; Warrington & Sanders, 1971). Finally, two studies have
reported results dependent on the instrument used. Albert, Butters, and Levin
(1979) found age/period peaks in young adulthood for recall of historical
information and memory for famous faces, but peak recall was associated with
occurrence during middle age for recognition of historical facts. Wilson,
Kazniak, and Fox (1981) found a U-shaped function in 69 year olds on a famous
faces test with peak recall for information from the 1930's and 1970's, but a
flat function across periods on a recall test of historical information.

Most prior investigations have generally sampled across all historical
events regardless of the nature of those events. Botwinick and Storandt (1980)
and Storandt et al. (1978) have examined news and entertainment items with

different age x period interactions for each item type. Tests focusing on only one type of item such as dates (Perlmutter et al., 1980), popular songs (Bartlett & Snelus, 1980), and TV shows and horse races (Squire et al., 1975; Squire & Chace, 1975) have generally found overall better recall or recognition for more recent events, even though some trends for an age x period interaction have been observed. The present study attempts to achieve a balance between two major kinds of instruments used in prior work by developing an test with four types of news items and four types of entertainment items. With this kind of test the age x period interaction might be more stable.

Method

Subjects were 335 volunteers participating in a psychometric study of which the general knowledge test was a part. Individuals were grouped as follows: 80 people ages 16-19 (teen), 28 aged 20-32 (young adult), 19 aged 33-51 (adult), 160 aged 60-74 (young old), and 48 aged 75-84 (old old).

The 48-item multiple-choice instrument tested recognition of events from six 15-year historical periods: (1) 1886-1900, (2) 1901-1915, (3)1916-1930, (4)1931-1945, (5) 1946-1960, and (6) 1961-1975. Eight questions were written for each period; half were news and half entertainment items. The four item categories of news items were: (1) the year an event occurred (In what year did Henry Ford introduce the Model T? Answer: 1908; period 2), (2) the location of an event (What city was the first home of the United Nations? Answer: San Francisco; period 5), (3) what a news celebrity was famous for (Which branch of the armed forces was Omar Bradley connected with? Answer: army; period 4), and (4) who was responsible for a particular news event (Who developed a vaccine

against rabies (hydrophobia)? Answer: Louis Pasteur; period 1). The four categories of entertainment items were: (1) what creation was associated with a particular individual (Who created the "Keystone Kops"? Answer: Mack Sennett; period 2), (2) nicknames of various celebrities (Who was known as "the Great Lover"? Answer: Rudolph Valentino; period 3), (3) what an entertainment personality was famous for (Who starred on "Your Show of Shows"? Answer: Sid Caesar & Imogene Coca; period 5), and (4) fads (What amateur sport became very popular in the 1970's? Answer: tennis; period 6). Subjects were instructed to choose the best of four choices even if they had to guess. They completed the test at their own pace.

Results

Data were analyzed in an age x period x item type (4 x 6 x 2) ANOVA with the last two factors within-subjects. All significant results were reliable at the .001 level except where mentioned below. Group means are depicted in Figure 1 for the news items and in Figure 2 for the entertainment items.

Figures 1 and 2 About Here

Age differences (F (4, 330) = 12.18) indicated that the teen group had lower scores than all older groups. Items from periods 2, 4, and 6 were recalled with greater frequency than items from periods 1, 3, and 5 (F (5, 1650) = 25.14). There was also a reliable age x period interaction (F (20, 1650) = 12.60). Generally all groups differed from one another for all periods except for period 3 where no groups differed. The age group with the highest

recognition scores also differed across periods: the two oldest groups performed best for periods 1 and 2, adults and young-olds were highest for periods 4 and 5, and young adults had the best performance for the most recent period.

Entertainment items were better recognized than news items ($\underline{F}$ (1, 330) = 79.08). Item type also interacted with age ($\underline{F}$ (4, 330) = 3.63; $\underline{p}$ < .01). All older groups differed from the teen group for both item types, but adults also had higher recognition than the young adults and old-olds on the entertainment items. The period x item type interaction was also significant

($\underline{F}$ (5, 1650) = 21.09). For new items the periods were ranked highest to lowest in the following order: 4, 2, 3, 1, 6, and 3. All the periods except adjacent ones differed from one another. Periods 2 and 4 also differed. For entertainment the pattern was different: 6, 2, 4, 3, 5, and 1. All periods differed except for periods 5 and 1 and periods 4 and 3.

Finally, there was a reliable triple-order interaction ($\underline{F}$ (20, 1650) = 5.47). While too complex to describe specific results, the interaction can be illustrated by examining the age group with highest recognition for each item type for each period. The results are summarized in Table 1. We would expect no true age/period peak for Period 1, as none of the subjects have experienced it, but we would expect some correspondence between age during the periods tested and performance. This is borne out in general by the findings reported in Table 1. However, for seven of the twelve item type x period comparisons, we find that more than one age group does reliably better than the others. These groups do not differ from each other. In all but two cases (Period 4

entertainment and Period 5 news) the age/period peaks are for ages 0 to 27.

Table 1 about here

Discussion

While news items differ from entertainment items and these item types interact with age and period, the key result is the nature of the period x age interaction. In terms of peak age when an event occurs, previous research has found variation in this peak age across periods. Botwinick and Storandt (1980) concluded that the notion of an age/period peak should be abandoned. The present study offers evidence to the contrary. We found that age/period peak varied from before birth to a mean of 27 years. While older groups may have shared the age/period peak with a given age group, observations corresponded to the predictions in all but two instances. In the two incorrect predictions, younger age groups than predicted had the best performance. In general, we conclude that use of parallel items across periods in the test instrument probably accounts for our results, which are more consistent than previous work.

That the age/period peak should vary from before birth until young adulthood is also consistent with Schaie's (1977-78) model of cognitive development in adulthood. Most learning takes place from infancy to the college years, and we might expect knowledge of current or recent past events to be included in that learning. In Schaie's stage model, the early portion of the adult lifespan is involved in acquisition of new information. Schaie's model

predicts greater recognition of information obtained in life through young

adulthood. At some point in young adulthood, though, a shift occurs from

acquisition to application of information as the individual begins to set some

life goals. Later points in the process also involve application of information

to career, family and the community. Schaie posits a stage of intellectual

integrity for the later years of life. This involves a reintegration of

previously acquired knowledge and experience. After young adulthood

miscellaneous facts as those from general knowledge or remote memory tests no

longer have the salience for optimum recall or recognition.

The present study attempted to reconcile the difficulty inherent in

previous studies of age differences in general knowledge by using a test of

several categories of homogeneous items. Results yielded an age x period

interaction that differed for the two overall item types, but in which best

recognition performance was found when an event occurred in the time period just

prior to the individual's birth to young adulthood. This is consistent with the

notion that the early years in life are devoted to acquisition of new

information.

References

Albert, M. S., Butters, N., & Levin, J. Temporal gradients in the retrograde amnesia of patients with alcoholic Korsakoff's disease. Archives of Neurology, 1979, 26, 211-216.

Bartlett, J. C., & Snelus, P. Lifespan memory for popular songs. American Journal of Psychology, 1980, 93, 551-560.

Botwinick, J., & Storandt, M. Memory, related functions and age. Springfield, IL: Charles C. thomas, 1974.

Botwinick, J., & Storandt, M. Recall and recognition of old information in relation to age and sex. Journal of Gerontology, 1980, 35, 70-76.

Perlmutter, M., Metzger, R., Miller, K., & Nezworski, T. Memory of historical events. Experimental Aging Research, 1980, 6, 47-60.

Poon, L. W., Fozard, J. L., Paulshock, D. R., & Thomas, J. C. A questionnaire assessment of age differences in retention of recent and remote events. Experimental Aging Research, 1979, 5, 401-411.

Sanders, H. I, & Warrington, E. K. Memory for remote events in amnestic patients. Brain, 1971, 94, 661-668.

Schaie, K. W. Toward a stage theory of adult cognitive development. Aging and Human Development, 1977-78, 8, 129-138.

Squire, L. R. Remote memory as affected by aging. Neuropsychologia, 1974, 12, 429-435.

Squire, L. R., Chace, P. M., & Slater, P. C. Assessment of memory for remote events. Psychological Reports, 1975, 37, 223-234.

Squire, L. R., & Slater, P. C. Forgetting in very long-term memory as assessed by an improved questionnaire technique. Journal of Experimental Psychology: Human Learning and Memory, 1975, 104, 50-54.

Storandt, M., Grant, E. A., & Gordon, B. C. Remote memory as a function of age and sex. Experimental Aging Research, 1978, 4, 365-375.

Warrington, E. K., & Sanders, H. I. The fate of old memories. Quarterly Journal of Experimental Psychology, 1971, 23, 432-442.

Wilson, R. S., Kaszniak, A. W., & Fox, J. H. Remote memory in senile dementia. Cortex, 1981, 17, 41-48.

Table 1

Age Groups with Highest Recognition for
Historical Period and Item Type

	Predicted Age Group	Actual Age Group[a]	Mean Age Actual Group
Period 1: 1886-1900			
News	-----	Young-Old	< 0
Entertainment	-----	Old-Old	< 0
		Adult	< 0
Period 2: 1901-1915			
News	-----	Old-Old	10
		Young-Old	< 0
Entertainment	-----	Old-Old	10
		Young-Old	< 0
Period 3: 1916-1930			
News	Old-Old	Old-Old	25
		Young-Old	12
Entertainment	Old-Old	Young Adult	< 0
Period 4: 1931-1945			
News	Young-Old	Adult	2
Entertainment	Young-Old	Young-Old	27
		Old-Old	40
		Adult	2
Period 5: 1946-1960			
News	Adult	Adult	17
		Young-Old	42
		Old-Old	55
Entertainment	Adult	Adult	17
Period 6: 1961-1975			
News	Young Adult	Young Adult	16
Entertainment	Young Adult	Young Adult	16
		Teen	8

[a] Where more than one age group is listed, it indicates that there
were no reliable differences between these groups. All groups in this
situation recognized more items than the remaining age groups tested.

Figure Captions

Figure 1. Mean recognition scores on news items as a function of age and
historical period from which the items were drawn.

Figure 2. Mean recognition scores on entertainment items as a function of
age and historical period from which the items were drawn.

NEWS

Legend:
- ●———● Old–Old
- ■———■ Young–Old
- ▲———▲ Adult
- □– – –□ Young–Adult
- ○– – –○ Teen

PERIOD: 1886–1900, 1901–1915, 1916–1930, 1931–1945, 1946–1960, 1961–1975

MEAN PROPORTION CORRECT: .35, .45, .55, .65, .75, .85

ENTERTAINMENT

Legend: Old-Old (●), Young-Old (■), Adult (▲), Young-Adult (□), Teen (○)

MEAN PROPORTION CORRECT (y-axis: .35, .45, .55, .65, .75, .85, .95)

PERIOD (x-axis: 1886–1900, 1901–1915, 1916–1930, 1931–1945, 1946–1960, 1961–1975)