ABSTRACT

This study investigates how pace of information presentation to the elderly influences learning of marketing information. The learning task involved recalling or recognizing brand, product, and commercial information from three advertisements which were mechanically manipulated through time compression or expansion to expose a subject to the commercials at different paces. In order to test the total time hypothesis of Cooper and Pantle (1967), the total time of exposure was held constant by varying the repetitions of the advertisement. Results indicate that elderly consumers remember less than younger subjects, but support the total time hypothesis of no pacing effects for older subjects. Some support was also found for applicability to younger subjects.

Advertisement Pacing and the Learning of Marketing Information by the Elderly*

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While some consumer research has recently addressed aspects of marketing to the elderly, little has been done to determine the extent to which the elderly differ from the usual 18–45 segment in their cognitive abilities. One notable exception is the classic review article by Phillips and Sternthal (1977) that discusses age differences in information exposure, learning, and influenceability. Based on their research review of the effects of information

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pacing on the elderly. Phillips and Sternthal (1977) conclude that rapidly presented information is poorly understood by the elderly. They suggest that marketing communications directed to the elderly should be restricted to self-paced media such as newspapers and magazines. Utilizing only self-paced media would remove television and radio as viable media vehicles for communicating with the elderly, a rather drastic decision given the Stephens (1981) study which shows that television is an important and trusted media source among the elderly.

However, the total time hypothesis suggests that it is the total time available for learning that affects learning, not how quickly the material is paced (if it is within perceptual bounds). The difference between young and old adults is that older adults require more total time to learn something, and if given this extra time, will not be adversely affected by the pace. Thus, television and radio would not be ruled out as communications vehicles for reaching the elderly. Total learning time and the pace of presentation have often been confounded in studies because, as the pace is quickened, the total time is shortened. Thus, results attributed to a faster pace could be due to the shortened total learning time.

The purpose of this research is to determine whether the total time hypothesis applies to marketing communications. The effect of pace of presentation on learning from television advertising by elderly consumers was investigated and compared to the effects on younger consumers.

REVIEW OF LITERATURE

To update knowledge of available research which bears on this question it is necessary to review two major streams of research, that from gerontology and that from marketing.

The results of numerous studies in various areas of gerontology have led many researchers to believe that the central nervous system in human beings slows as a person ages, leading to a general decline in both physical and mental performance (Botwinick, 1978; Hultsch & Pentz, 1980; Kinsbourne & Berryhill, 1972; Rabbitt, 1968; Salthouse & Somberg, 1982; Witte, 1975). This observation led to the testing of rapid pacing of learning material on elderly subjects. Older subjects were found to be "most inferior to young controls . . . under conditions of external pacing" (Kinsbourne & Berryhill, 1972), but their performance was relatively better than the younger subjects at slower paces. Thus, the pace of the material itself was viewed as the cause of much of the observed learning deficiencies.

The total time hypothesis, however, challenges this common assumption. This hypothesis was first advanced in reference to the verbal learning of young adults in free-recall and paired-associate tasks (Bugelski, 1962; Murdock, 1960). Cooper and Pantle (1967), in their review of the

total time literature, remark that "the total time hypothesis states that a fixed amount of time is necessary to learn a fixed amount of material, regardless of the number of individual trials into which that time is divided." Thus, if it takes 10 seconds to learn each of the items in a paired-associate list, a person could reach criterion with either 20 half-second-per-item exposures (or trials), 10 1-second exposures, five 2-second exposures, or one 10-second exposure.* The hypothesis can be studied in two ways. First, a researcher could present material to two subject groups at different rates, but keep the total time the same. Second, the two groups could be allowed to learn the same material, at different paces, until some criterion is reached, and then the total time would be compared. The researcher would then look for an absence of statistical significance between the groups in either method to support the total time hypothesis.

Several gerontologists have successfully extended the total time hypothesis to the paced-learning studies of the elderly (Kinsbourne & Berryhill, 1972; Smith, 1976; Winn & Elias, 1975, 1977). They note that in previous studies of pacing, when a faster pace was used, less total time was available for learning. In other words, subjects were not given more exposures to make up for the faster presentation rate. These studies suggest that the pace of presentation does not influence learning, but that elderly subjects begin with a learning disadvantage which causes their performance as a group to always be poorer than younger subjects.

Some studies do suggest caution in the acceptance of the total time hypothesis. Cooper and Pantle (1967), in their comprehensive review of total time studies with young subjects, note that while total time relationships hold true in most studies of paired associate and free recall learning, "it does not hold for tasks whose minimal requirements exceed simple rehearsal or study." In reference to common objectives in advertising, then, pacing may not affect such objectives as brand awareness or product feature awareness, but may affect more difficult learning objectives.

The issue of pace of presentation has received some attention in marketing literature. Several reviews of the nonmarketing literature on learning by the elderly have appeared in marketing publications (Ensley, 1983; Meadow, Cosmas, & Plotkin, 1980; Phillips & Sternthal, 1977; Ross, 1981). The review by Phillips and Sternthal (1977) deals in some detail with the pacing issue, but it fails to discuss the total time view of the gerontology studies. The Phillips and Sternthal recommendation that marketers attempt to use only self-paced media when presenting information to the elderly is accepted by Ross (1981) and Meadow, Cosmas, and Plotkin

* For free recall learning, the hypothesis was later formulated to posit that a fixed amount of time is necessary to learn a certain number of words, so a list of 30 words presented at two seconds per word would produce the same number of words recalled as a list of 60 words presented at one second per word.

(1980), who also make no mention of the total time hypothesis. An experimental study that manipulated the pacing variable in an advertising context was done by Stephens (1982), but she also did not take into account the total time hypothesis. Stephens used time compression to increase the pace of several ads from 30 seconds to 25 seconds to investigate the effects of speed of presentation on several learning measures. Her sample consisted of three age categories: young (20–28 years), middle (40–49 years), and old (60–69 years). Several studies in time-compressed advertising found equal or better recall for time-compressed ads over normal-speed ads (LaBarbera & MacLachlan, 1979; MacLachlan & LaBarbera, 1978; MacLachlan & Siegel, 1980; Riter, Balducci, & McCollum, 1982–83). Stephens (1982), however, found that middle-aged and older adults have lower recall scores for time-compressed ads than the young subjects. She concludes, "Apparently elderly adults do suffer in their ability to process information when they cannot control the pace and when the rate of information flow is faster than normal." Schlinger, Alwitt, McCarthy, and Green (1983) also report that age had a "small influence on reactions to time compressed versus ordinary time versions" of ads in their studies, but no age range was given for their sample and the direction of difference was not specified.

HYPOTHESES

The review of literature reveals that elderly subjects do more poorly than younger subjects on rote learning tasks. There is also some support for this learning difference from marketing communications (Stephens, 1982; Stephens & Warrens 1983–84). Therefore, the following null hypothesis was tested.

H1. There is no difference between elderly and younger subjects in the recall of practical marketing information.

To investigate the total time hypothesis of the effect of pacing, the following null hypotheses were tested:

H2. When total learning time is held constant, there is no difference in elderly subjects' recall of marketing information due to variation in the pace of presentation.

H3. When total learning time is held constant, there is no difference in elderly subjects' recognition of marketing information due to variation in the pace of presentation.

To support the total time hypothesis, H2 and H3 would need to be accepted.

METHODOLOGY

Experimental Design and Treatments

To change the pacing of the advertisement without changing the information content, time compression and expansion were employed to produce three types of treatments. Pacing Treatment I took a 30-second commercial and compressed it by 20% to produce a 24-second commercial. This advertisement was shown five times during a 1-hour program for a total learning time of 120 seconds. Pacing Treatment II showed the 30-second commercial four times during a 1-hour program for a total learning time of 120 seconds. Pacing Treatment III took the 30-second commercial and expanded it by 33% to 40 seconds and showed it three times in a 1-hour program, again for a total learning time of 120 seconds. The percent expansion is different from the percent contraction in order to achieve the same total time for the conditions, because the total time is more important in testing the hypotheses than equal pacing changes. Furthermore, the percent changes are within the same general range.

The advertisements were chosen so that the subjects would not have been exposed to them prior to this study and so that the products or services advertised could be used by all ages. Two filler advertisements were also chosen. This use of filler advertisements allowed for more realism in the program and kept the subjects from unduly focusing on only test advertisements. The program in which the advertisements were placed was a documentary about nature.

To insure that a particular combination of advertisements did not influence recall or recognition, six different videotapes were produced with all possible combinations of advertisements at the various paces. Each tape presented one advertisement at the 24-second pacing, one at 30 seconds, and one at 40 seconds. In addition to the required repetitions of the test advertisements, one of the filler advertisements was shown twice and the other once. The advertisement which was shown twice was chosen randomly. Thus, there were a total of 15 advertisements on each tape. The order in which they were shown was chosen using a random numbers table.

Data collection was done in two stages. First, a questionnaire was filled out by the respondent at the time the treatment was administered. The respondent was asked his or her chronological age, educational background, home phone number, and first name. In addition, a few questions were asked to disguise the purpose of the study. The pacing treatment the respondent received was noted after the form was returned.

Second, a telephone questionnaire, administered by a trained interviewer, was used to collect the recall and recognition data for the study. It contained questions which elicited information on the test advertisements seen by the respondent.

The study sample was chosen from four cities in the Pacific Northwestern United States. A total of 17 groups participated in the study, including student, church, senior citizen, and professional groups. Because the elderly are less likely to agree to participate in a study, retirement homes were contacted to insure a large enough sample of adults over 65 years of age. Eight retirement communities permitted the researcher to conduct the study with interested residents, thus allowing for the inclusion of a large number of respondents who were over 75 years and still ambulatory.

Because of the nature of the study, calculating one "response rate" is difficult. A total of 264 people began to watch the program. Of these, 151 people or 57% actually finished watching the program, filled out the self-administered questionnaire, and had telephones so they could be reached for the second phase of the study. All of this decrease occurred in groups of elderly respondents.

It was noted that most of the decrease occurred among those who were not very alert or did not have phones. Also, the nature of the design, viewing a television program and answering questions by phone, would tend to be unattractive to those elderly who were sight or hearing impaired. The final sample of elderly respondents for this study, then, likely overrepresents the more mentally alert members of the population. In a sense, this study presents a best-case scenario for the performance of older subjects on day-after recall.

A final response rate can be calculated for the second phase of the study. Of the 64 elderly respondents available for the day-after recall test, 41 (or 64%) completed the study. This compares to 70 out of 87 (or 80%) of the younger subjects who completed the second phase of the study. Overall, a final sample of 111 was obtained. This represents 42% of all those who began watching the program and 73.5% of those who could be reached by phone for the day-after recall. Forty percent of the final sample was 20–24 years old, 8% was 25–29 years old, 19% was 30–34 years old, 6% was 65–74 years old, and 27% was 75 years and older. Some analytical procedures collapsed the two youngest categories.

Data Collection and Analysis Methods

Groups of respondents were shown the 1-hour television program with inserted advertisements previously described. These groups were assigned to each of six tapes in an attempt to distribute the various age breakdowns through the various treatment combinations. After viewing the program, the subjects were asked to fill out the questionnaire portion of the survey instrument described earlier. Because a major problem in researching the elderly is their tendency to make omission errors (Botwinick, 1978; Kinsbourne & Berryhill, 1972; Perone & Baron, 1982), el-

derly participants were informed that for every fully completed survey returned, a certain sum would be contributed to the treasury of their organization. Such incentives have been shown to substantially decrease omission errors by the elderly, while not increasing commission errors (Leech & Witte, 1971; Perone & Baron, 1982).

Originally, researchers planned to telephone subjects two days after the showing in order to collect the recall and recognition dependent variable data to make the data comparable with the Stephens (1982) study. During the pretest, however, it was found that a high number of the elderly respondents remembered nothing of the advertisements. So, day-after recall was done instead. The respondents were not told ahead of time that this would be required of them for the study. The calling was all done by one interviewer to lessen problems with interviewer variation bias.

Four measures of learning from the test ads were collected: commercial recall, product recall, brand recall, and recognition. Since each subject saw each of the three test advertisements at a different pacing, dependent measures for each respondent on each of the three test advertisements had to be collected. This was not a problem, as each subject was asked about each advertisement recalled in the telephone survey.

To get a score for commercial recall, the respondent's answer to a question asking them to relate anything he or she remembered about each advertisement was analyzed. One point was given for each independent fact remembered from an advertisement. Researchers then determined the total points and this became the subject's commercial recall score for that advertisement. This procedure was repeated for each advertisement seen by the respondent. The final measurement was, therefore, count data that ranged from 0–15 for the bank commercial, and 0–10 for both the printing company advertisement and the country club commercial.

Since the dependent measures were determined for each ad, product recall and brand recall were necessarily nominal in nature—either the person recalled the product or brand or they did not. Recall was broken into two categories to make it comparable to the way recall was collected by Stephens (1982) in her study of how elderly adults react to compressed advertisements. The recognition measure combined recognition of product and brand into one measure. For each advertisement, a respondent could fall in one of three categories: either they recognized neither the product category nor the brand name, recognized one of the two, or recognized both.

Because of the different types of dependent measures collected, two different statistical methods were used in testing the hypotheses. When investigating the effects of age and pace on commercial recall for H1 and H2, an analysis of variance (ANOVA) was performed.

Because of the categorical nature of the dependent variables product recall, brand recall, and recognition, hypotheses related to these measures were tested through log linear models.

RESULTS

Choice of Log Linear Models for Hypothesis Testing

In this study, the researchers chose for further discussion the model with the greatest probability as the best-fitting model, with two exceptions. The first exception involved product recall for the bank advertisement. The model chosen includes only the term for the interaction of age and recall (AR)* and has a probability of 0.3571. The model adding the terms for age and pace (AP) and pace and recall (PR) had a probability of 0.4476. However, prior analysis in Step 2 of the procedure had indicated that these terms were probably not needed. In addition, the chi-square statistic for the association between pace and recall was not significant ($0.25 > p > 0.10$). Thus, the AR model fits almost as well as the AR, AP, PR model and is more expedient.

The second exception occurs in the choice of the model for brand recall of the country club estates advertisement. The more appropriate model includes the AR and AP terms. The model with higher probability adds the PR term even though prior analysis had indicated that it was not needed. Also, the chi-square statistic for the association of pace and brand recall was nonsignificant ($p = 0.2722$).

Comparison of Young and Old Subjects

Hypothesis 1 was tested for each of the three different measures of recall. Commercial recall scores for younger and older subjects were compared using an ANOVA for each advertisement (Table 1). The main effect of age was highly significant ($p = 0.001$) for each advertisement. As can be seen from Table 1, there is a significant decrease in mean recall between younger subjects and those over 65 years of age for the first two advertisements. Because there is a significant interaction in the third advertisement, the situation is not as simple, but the scores clearly decrease with increased age, as can be seen in Figure 1 which shows a graph of the interaction.

To determine whether age influenced recall of product category or brand name of the advertiser, a log linear analysis was done for each advertisement using the dependent measure, age, and pace as the variables. (See Table 2 for details of the complete models.) For each of the three advertisements, the best-fitting model included the interaction term of age

* Since the model is working with contingency tables, it does not differentiate between dependent and independent variables. Thus, it is acceptable in log linear modeling to refer to an "interaction" of a dependent and independent variable. What this means is that there is a significant relationship between those two variables (Upton, 1978).

TABLE 1
ANOVA for Influence of Age and Ad Pacing on Commercial Recall

Bank advertisement

Source of variation	df	Sum of squares	Mean square	*F*	*p* value
Main effects	6	913.840	152.307	10.715	0.001
Age	4	844.308	211.077	14.849	0.001
Pace	2	37.308	18.654	1.312	0.274
Interaction					
Age*Pace	7	63.246	9.035	0.636	0.725
Residual	96	1364.632	14.215		
Total	109	2341.718	21.484		

Age categories	Means*	Standard deviation
20–24	7.25	4.09
25–29	9.78	1.86
30–64	7.00	8.67
65–74	1.43	1.81
75+	1.53	3.77

Printing company advertisement

Source of variation	df	Sum of squares	Mean square	*F*	*p* value
Main Effects	6	235.969	39.325	8.581	0.001
Age	4	218.663	54.666	11.927	0.001
Pace	2	9.592	4.796	1.046	0.355
Interaction					
Age*Pace	8	28.727	3.591	0.783	0.618
Residual	96	440.007	4.583		
Total	110	704.703	6.406		

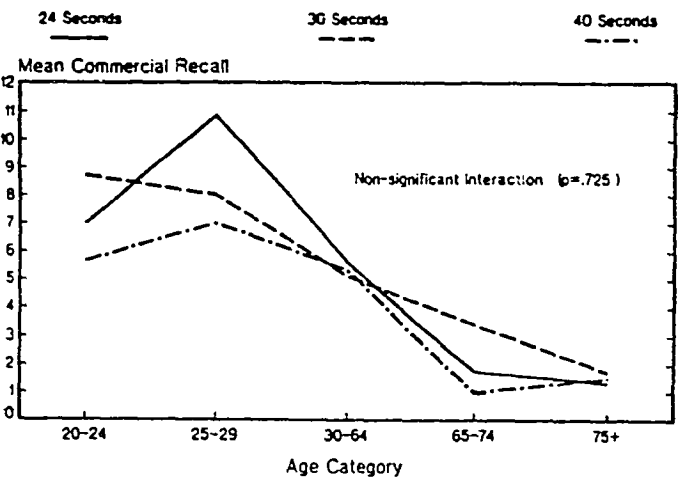
Age categories	Means*	Standard deviation
20–24	[3.59	2.43
25–29	[2.89]	2.76
30–64	[1.86]	2.65
65–74	[0.71]	1.25
75+	0.20]	0.66

Country club advertisement

Source of variation	df	Sum of squares	Mean square	*F*	*p* value
Main Effects	6	429.780	71.630	15.144	0.001
Age	4	416.821	104.205	22.031	0.001
Pace	2	10.732	5.366	1.135	0.326
Interaction					
Age*Pace	8	99.845	12.481	2.639	0.012
Residual	96	454.069	4.730		
Total	110	983.694	8.943		

Age categories	Means	Standard deviation
20–24	4.91	2.39
25–29	2.67	2.40
30–64	3.05	3.28
65–74	0.14	0.38
75+	0.40	1.40

* Bracketed means are not significantly different from one another.



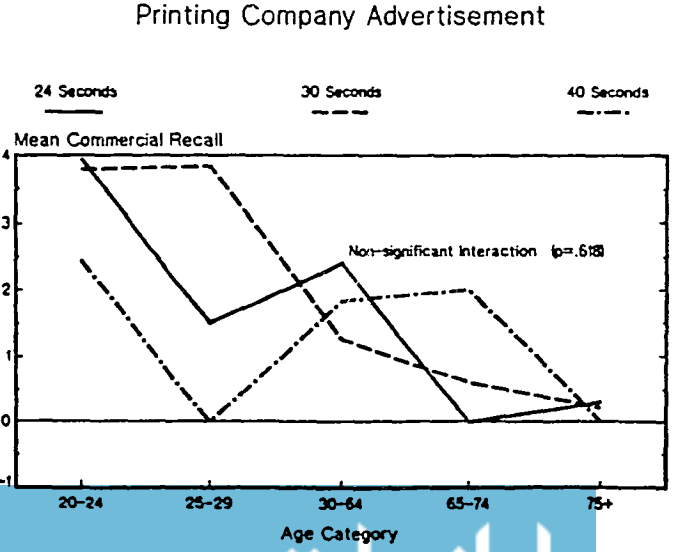


FIGURE 1
Interaction of Age and Pace for Commercial Recall

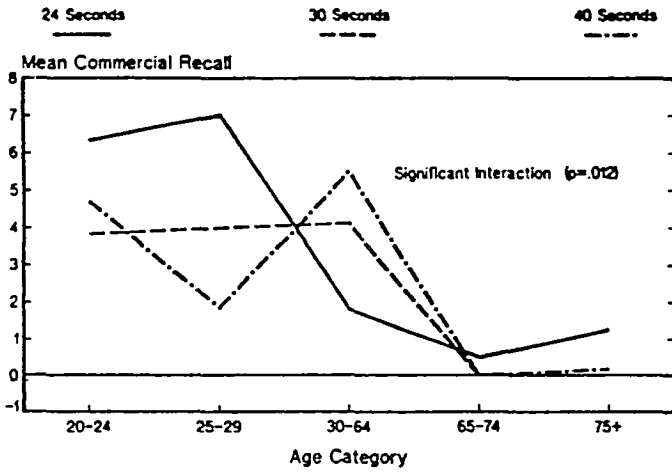


FIGURE 1 (*Continued*)

and product recall. Thus, age and product recall are not independent of each other for any of the advertised products. And, as can be seen from Table 3, product recall decreases significantly as age increases. [The chi-square calculations in Table 3 are included for reference purposes only, since the relationship was tested with the log linear model. None of the cells in Table 3 have expected values of less than 1, but 25 percent (two cells) do have expected values of less than 5, although one of the cell's expected value is 4.5.]

The same situation occurs in the analysis of the association between brand recall and age. Each of the best-fitting models includes the term for the interaction between age and brand recall. Thus, the two are not independent. As Table 4 shows, older subjects are less likely to recall the brand name of the advertiser for each of the three test advertisements.

Thus, for each of the three dependent measures, recall decreases with increased age. Hypothesis 1 is, therefore, rejected.

Effect of Pace of Presentation on Recall

Hypothesis 2 was tested for each of the three dependent measures of recall. Since the total learning time was held constant under each of the

TABLE 2
Preferred Log-Linear Models for Relationships Between Age, Pacing, and Dependent Measure of Learning for Three Advertisements†

Bank Advertisement	df	Chi-square	*p*-value
Product Recall			
AR	16	17.45	0.3571*
Brand Recall			
AR	16	12.94	0.6774
Recognition			
AR, PR	18	20.35	0.3133
Printing Company Advertisement			
Product Recall			
AR, AP	6	1.95	0.9238
Brand Recall			
AR, AP	4	2.82	0.5876
Recognition			
AR, PR, AP	12	8.08	0.7790
Country Club Advertisement			
Product Recall*			
APR, AR, PR, AP			
Brand Recall			
AR, AP	6	8.54	0.2012*
Recognition			
AR, AP	16	13.70	0.6207

† R = Appropriate dependent measure (recall or recognition), A = age, P = pace.
* Not highest probability.
**Since this is a saturated model, there is a perfect fit with the data and any statistics would be trivial.

pacing conditions, the total time hypothesis requires a nonsignificant relationship between pace of presentation and recall. As can be seen in Table 1, pace of presentation has no effect on commercial recall in any of the three test advertisements ($p = 0.274$, 0.355, and 0.326, respectively). Therefore, overall recall was the same across each of the three pacings.

But did the elderly react differently to the pacings than younger subjects? The interaction of age and pace tests this area. For the bank and printing company advertisements, the interaction term is nonsignificant ($p = 0.725$ and 0.618). Thus, in these two advertisements, the various age groups reacted as their age would predict and were not differentially influenced by the pace of the advertisement. For the third advertisement, the country club estates, the interaction of pace and age was significant ($p = 0.012$). However, as Figure 1 shows, it was not the elderly who were affected by the pacing changes. Instead, the major differences in reaction occurred between the 25–29 and 30–64 groups. The younger group, as predicted from previous research, remembered more from the fast-paced advertisement, while the middle-aged group remembered more from the slowest-paced advertisement, also predicted by previous research. The trend did not continue, however, with the two oldest groups. While recall scores were very close for all pacings, the faster pacing had the highest recall.

TABLE 3
Relationship of Product Recall and Age for Three Test Advertisements

Bank advertisement

Product recall?	Age categories				
	20–29	30–64	65–74	75+	Total
No	9.4% (5)	33.3% (7)	57.1% (4)	80.0% (24)	36.0% (40)
Yes	90.6% (48)	66.7% (14)	42.9% (3)	20.0% (6)	64.0% (71)

$\chi^2 = 42.85$, $p = 0.0000$.

Printing company advertisement

Product recall?	Age categories				
	20–29	30–64	65–74	75+	Total
No	26.4% (14)	57.1% (12)	85.7% (6)	100% (30)	55.9% (62)
Yes	73.6% (39)	42.9% (9)	14.3% (1)	0% (0)	44.1% (49)

$\chi^2 = 44.89$, $p = 0.0000$.

Country club advertisement

Product recall?	Age categories				
	20–29	30–64	65–74	75+	Total
No	17.0% (9)	47.6% (10)	100% (7)	93.3% (28)	48.6% (54)
Yes	83.0% (44)	52.4% (11)	0% (0)	6.7% (2)	51.4% (57)

$\chi^2 = 52.69$, $p = 0.0000$.

For the dependent variable of product recall, log linear models were developed to investigate whether pacing influenced recall. The results for the bank and printing company advertisements indicate that pace of presentation was not related to recall (Table 2). For the printing advertisement, the term for age and pace (AP) is included, but this term is merely an artifact of the way the age categories were distributed through the pacing conditions. It is a result of the sampling procedure and is unrelated to learning. When the log linear model for product recall in the country club advertisement is considered, a model with a three-way interaction is needed for the first time in this analysis. All possible combinations of the three terms are used. The presence of the three-way term, APR, suggests that there is an interaction of age and pace in product recall for this advertisement. This result is in accord with the findings for commercial recall for the country club advertisement, which was the only commercial to have a significant interaction between age and pace. But again, the difference occurs with the middle-aged group. The 24-second advertisement is best for the youngest, and surprisingly, the oldest groups, but the 30–64 group remembered the product better at the 30- or 40-second pacings.

TABLE 4
Relationship of Brand Recall and Age for Three Test Advertisements

Bank advertisement

Brand recall?	Age categories 20–29	30–64	65–74	75+	Total
No	67.9% (36)	81.0% (17)	85.7% (6)	96.7% (29)	79.3% (88)
Yes	32.1% (17)	19.0% (9)	14.3% (1)	3.3% (1)	20.7% (23)

$\chi^2 = 9.89$, $p = 0.0195$.

Printing company advertisement

Brand recall?	Age categories 20–29	30–64	65–74	75+	Total
No	54.7% (29)	85.7% (18)	100% (7)	100% (30)	75.7% (84)
Yes	45.3% (24)	14.3% (3)	0% (0)	0% (0)	24.3% (27)

$\chi^2 = 25.69$, $p = 0.0000$.

Country club advertisement

Brand recall?	Age categories 20–29	30–64	65–74	75+	Total
No	41.5% (22)	61.9% (13)	85.7% (6)	100% (30)	64.0% (71)
Yes	58.6% (31)	38.1% (8)	14.3% (1)	0% (0)	36.0% (40)

$\chi^2 = 29.97$, $p = 0.0000$.

When considering if pace influenced brand recall, none of the three models included the PR term. Therefore, pace did not seem to affect brand recall. In each case, a person's age is the major determining factor associated with differences in recall.

Thus, pace of presentation influenced recall in only one of the six models testing the nominal dependent variables, and the effects were not strongly noted among the elderly. Pace of presentation was also shown to have no influence on commercial recall of the elderly. Hypothesis 2 is, therefore, not rejected. The results tend to validate the total time hypothesis for the elderly, and also suggest that the theory may hold true for younger subjects.

The Effect of Pace of Presentation on Recognition

Since the measure of recognition used is an ordinal measure, the log linear model was used to determine what effect age and pace had on the

recognition of product and brand information from each of the three test advertisements (H3). The recognition data were tested to see which combination of terms would best fit the data (Table 2). For each of the three advertisements, pace and age did not interact with the recognition measure, and hence the pattern of the elderly subjects' recognition did *not* differ from younger subjects at the various pacings.

For the country club estates commercial, there was no relationship at all between recognition scores and pace (Tables 2 and 5). All three pacings produced the same pattern of scores. This result would support the total time hypothesis.

For the printing company advertisement, the best-fitting log linear model contained the interaction term of pace and recognition measure, but the cross-tabulation and subsequent chi-square (see Table 5) showed only a mildly significant relationship between the two ($p = 0.0853$). As pace increased, so did recognition.

TABLE 5
Relationship Between Pace and Recognition Score for Each of Three Test Advertisements

Bank advertisement

Recognition score	Ad pacings 24	30	40	Total
0	9.1% (3)	10.3% (4)	25.7% (9)	15.6% (16)
1	15.2% (5)	33.3% (13)	5.7% (2)	18.7% (20)
2	75.2% (25)	56.4% (22)	68.6% (24)	66.4% (71)

$\chi^2 = 12.94$, $p = 0.0116$.

Printing company advertisement

Recognition score	Ad pacings 24	30	40	Total
0	20.0% (8)	28.9% (11)	24.1% (7)	24.3% (26)
1	10.0% (4)	10.5% (4)	31.0% (9)	15.9% (17)
2	70.0% (28)	60.5% (23)	44.8% (13)	59.8% (64)

$\chi^2 = 8.18$, $p = 0.0853$.

Country club advertisement

Recognition score	Ad pacings 24	30	40	Total
0	14.7% (5)	12.9% (4)	9.5% (4)	12.1% (13)
1	23.5% (8)	19.4% (6)	23.8% (10)	22.4% (24)
2	61.8% (21)	67.7% (21)	66.7% (28)	65.4% (70)

$\chi^2 = 0.725$, $p = 0.9482$

For the bank advertisement, the log linear model again included the interaction term for pace and recognition, and this time, the subsequent chi-square is significant ($p = 0.0116$, Table 5). However, in all cases, age is significantly related to recognition ($p = 0.0002$). When pace and recognition are compared controlling for age, only the table comparing pace and recognition for those 30–64 shows a mildly significant relationship (Table 6). These results could be influenced by the presence of several cells with low expected values. According to the log linear model, then, pace has some influence on bank advertisement recognition, but when looking at the individual contingency tables by age, no clear statement

TABLE 6
Relationship Between Ad Pacing and Bank Recognition Score Controlling for Age

20–29 Years

Recognition score	Ad pacings 24	30	40	Total
0	0% (0)	0% (0)	6.3% (1)	1.9% (1)
1	11.8% (2)	20.0% (4)	0% (0)	11.3% (6)
2	88.2% (5)	80.0% (16)	93.8% (15)	86.8% (46)

$\chi^2 = 5.66$, $p = 0.2263$.

30–64 years

Recognition score	Ad pacings 24	30	40	Total
0	0% (0)	22.2% (2)	33.3% (2)	20.0% (4)
1	0% (0)	44.4% (4)	0% (0)	20.0% (4)
2	100% (5)	33.3% (3)	66.7% (4)	60.0% (12)

$\chi^2 = 8.89$, $p = 0.0639$

65–74 years

Recognition score	Ad pacings 24	30	40	Total
0	25.0% (1)		33.3% (1)	28.6% (2)
1	0% (0)		33.3% (1)	14.3% (1)
2	75.0% (3)		33.3% (1)	57.1% (4)

$\chi^2 = 1.90$, $p = 0.3875$.

75 and over

Recognition score	Ad pacings 24	30	40	Total
0	28.6% (2)	20.0% (2)	50.0% (5)	33.3% (9)
1	42.9% (3)	50.0% (5)	10.0% (1)	33.3% (9)
2	28.6% (2)	30.0% (3)	40.0% (4)	33.3% (9)

$\chi^2 = 4.29$, $p = 0.3687$.

about how one pace differs from another can be made. For the elderly, the pace does not seem to be significantly related to recognition.

For these three advertisements, then, pace has been shown to be unrelated to recognition performance by those 65 and over in all cases. Hypothesis 3 is not rejected, which lends support for the applicability of the total time hypothesis to recognition learning in marketing on the part of the elderly. In addition, the results suggest that the pacing of an advertisement also may not affect younger subjects.

DISCUSSION

Based on the preceding analysis, the theoretical base used for this study was supported for the three hypotheses. Hypothesis 1 tested whether aging influences recall ability for marketing information presented in a realistic environment. The three analyses performed show that there is a highly significant relationship between aging and recall. As age increases, subjects are less likely to recall the brand or product advertised, or to recall other aspects of the commercial. These results held true for three different advertisements. The lowered recall was predicted by both the gerontology and marketing literature, so this finding was not particularly surprising. It is important, though, to remember that these results speak for performance as a group. There were individual elderly subjects who remembered more than individual younger subjects. However, in general, the unaided recall of older subjects was very poor compared to younger subjects.

Also, this study did not test how the elderly would have responded when faced with the need to change banks. For example, would the brand name Plains National Bank have seemed familiar and thus have influenced bank choice even though many of the respondents had absolutely no remembrance of seeing an advertisement for a bank? One cannot tell from this study.

The total time hypothesis was tested in the second and third hypotheses of this study. In all, 12 separate models were tested for four dependent measures across three advertisements. Of those 12 tests, only 3 showed any effect of pace on recall or recognition. In one, the recognition of bank information, the pacing effect was apparently uniform across ages with the 24-second pacing producing better recognition scores. The other two instances involved commercial and product recall for the country club estates advertisement. In both of these cases, there was an interaction of age, pace, and recall, with the fastest advertisements leading to the highest recall for young groups and the slower advertisements producing greater recall for the middle-aged group. The elderly did not seem to be affected

in either case. Interestingly, in brand recall and recognition for the same ad, pace did not interact with the dependent measure, and there was no three-way interaction of age, pace, and dependent measure. It is possible, therefore, that the significant results for pace were spurious.

Even if they were not, pace did not appear to influence the elderly subjects' learning. This is contrary to the results of Stephens (1982), which found lower recall for the elderly at faster paces. There are two areas of concern related to this result. First, it is possible that the differences in recall between pacing treatments were too small to detect with the sample size of this study. However, the sample size of 111 is almost identical to that of Stephens (119) and the pacing treatments were more extreme than those used by Stephens and more extreme than anything used by the advertising industry. But even if there were actual differences in recall based on the pace of the advertisement, these results show that, practically, the different paces made almost no difference to actual recall or recognition scores for this sample.

The second area of concern relates to the type of person in the final sample. For both the younger and older subjects, the nature of the study community skewed the sample towards the better educated. Then, in an effort to include a number of older respondents, the study was conducted in several retirement communities, thus allowing the respondents an opportunity to leave during the course of the study. Thus, we can imagine that those people who would have had difficulty seeing or hearing the program would have left, or perhaps not even come to a program which they knew would tax their abilities. The same would hold true for the subject who was less mentally alert. This mortality effect worked to reduce the sample of older respondents to those most mentally alert and capable. Thus, the question could be raised: What would the effect of a faster pace be on the less alert older subject? Would they have responded better to the slower advertisement? This is indeed possible, but does not explain why Stephens (1982) found a difference and this study did not. The Stephens sample of older subjects had an average age of 66.7 years and only went up to 75 years of age, while 30 of the 37 older respondents in this study were at *least* 75 years of age. Since recall ability seems to decrease with increased age, differences should have appeared in this study and not in Stephens' if the less alert, older subjects were more likely to be affected by the pacing changes.

In addition to supporting the total time hypothesis for older respondents, the study also lends support for the applicability of the total time hypothesis among younger subjects. Contrary to previous studies, younger subjects did not overwhelmingly have better recall of faster-paced advertisements. In only three of the 12 tests did this result hold, even though the faster advertisements were seen five times, as compared to four or three times for the slower commercials. The total time hypothesis, then,

could help explain some of the discrepancies noticed in time-compression studies with younger subjects.

For the marketer attempting to make practical advertising decisions in reference to the elderly market, several points should be made. The elderly subjects who completed this study were not representative of the entire population. They were more likely to be physically healthy, to have good hearing and eyesight, to be well-educated and to be mentally alert. And yet, they learned, as a group, almost no marketing information from these advertisements. While the results indicate that the pacing of the commercials is not at fault, it would be wise for marketers to be researching how to improve the recall scores for the elderly. It could be that the total time necessary to effectively learn new information may be so high as to be prohibitively expensive. In addition, the changes necessary to make the ads more effective with the elderly, perhaps louder volume or less clutter, may make them less appealing or more offensive to other age groups watching the program.

As this research shows, television advertising need not be rejected for the elderly simply because it is externally paced, but efforts must be made to determine how to make television advertising effective. Because of the total time needed to learn information by the elderly, other forms of advertising may be more cost efficient.

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