Consumer Memory for Television Advertising: A Field Study of Duration, Serial Position, and Competition Effects

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We simultaneously analyze the impact on consumer memory of the duration and serial position of a commercial and of the number of competing commercials in a block using a marketplace database of 2,677 television commercials. Our results indicate that duration, competition, and the time lag until the onset of a commercial in a block have large effect sizes, while primacy and recency have only modest effect sizes. By decomposing serial position into its ordinal and time-lag aspects, this study shows that recency effects are masked by the time until the onset of a commercial in a block. The findings suggest that, given comparable costs and a goal to maximize brand recall, placing a commercial first is better than placing it last. In addition, the analyses identify several significant and previously undocumented interactions.

There is impressive evidence that the resources consumers devote to message processing influence the extent to which they learn from, and subsequently recall, advertising. Various specific variables are likely to affect the extent of message processing and resulting consumer memory. For instance, the positive impact of the duration of television commercials (Patzer 1991; Singh and Cole 1993) and the negative impact of the number of competing advertisements on consumer memory have been established (Brown and Rothschild 1993; Webb and Ray 1979). Positive serial position effects on subsequent consumer memory, in particular being first or last in a block of television commercials, have been found as well (Burke and Srull 1988; Stewart et al. 1985).

To date, the effects of a commercial's duration, its serial position, and the level of advertising competition on consumer memory have not been examined simultaneously. Moreover, the effects of competing advertising on consumer memory have typically been examined by increasing the number of ad blocks embedded in programming of a certain length (Brown and Rothschild 1993;

Webb and Ray 1979). In contrast, the current study looks at the effect of varying the number of commercials within a block, which has not been examined before. Furthermore, research to date has focused on the ordinal aspect of serial position (i.e., whether a particular commercial is first, second, third, and so forth in a block), overlooking the time-lag aspect related to whether a commercial in the block starts after 10, 20, or 30 seconds, and so forth. This study is the first to explore how consumer memory for advertising is affected by both the ordinal and time-lag aspects of serial position.

Research on consumer memory for advertising has tended to use laboratory settings with relatively small student samples. Although the laboratory experiment is the best way to separate cause from effect and it permits control that is impossible outside the lab, differences in conditions and context limit generalization of lab findings to real-world situations. Wells (1993, p. 492) recently called for an increased use of field studies and stressed that findings of research "would be substantially more credible if students were not so often the first and only choice."

The purpose of this study is to examine the influence of the duration of commercials, their serial position in a block of commercials, and the magnitude of advertising competition on consumer memory for television advertising, by using marketplace data. We analyze data about the unaided and aided brand-name recall for 2,677 television commercials that were obtained from over 39,000 consumers in real-life situations over a period of 17 years in The Netherlands. The commercials appeared in 224

blocks between programs on national television, and subjects were screened to ensure that they had all seen all commercials in a particular block. The database allows us to replicate findings that have been obtained in experimental, laboratory contexts with student samples, to examine some main and interaction effects between variables that have not yet been explored, and to examine the effect sizes of predictors under natural conditions. Our results provide new insights about the simultaneous effects of important media factors on consumer memory. The results have managerial implications as well, since the duration of commercials and their serial position in commercial blocks of different sizes are under management's control.

DURATION, SERIAL POSITION, AND COMPETITION EFFECTS

Theories from multiple research streams predict that duration (i.e., the length of a commercial in seconds) has a positive impact on the distinctiveness of the ad's memory trace and hence on its retrieval likelihood (Alba and Chattopadhyay 1986; Wyer and Srull 1986). Consistent with the total time hypothesis that "the amount learnt is a direct function of the time devoted to learning" (Baddeley 1990, p. 151), longer compared to shorter television commercials provide viewers more opportunity to attend to and process the message, thus enhancing viewer learning (Batra and Ray 1986; Moore, Hausknecht, and Thamodaran 1986; Pechmann and Stewart 1988). In addition, longer television commercials facilitate learning by allowing the same information to be repeated more frequently within a single exposure than shorter commercials do (Singh and Cole 1993). The degree of learning increases the likelihood of retrieval, and thus of brand-name recall. As a result, the first hypothesis is offered:

> **H1:** Duration of television commercials has a positive effect on brand-name recall.

The ordinal aspect of serial position is the location of a commercial relative to other commercials in a sequence (i.e., first, second, third, etc.). The time-lag aspect of serial position specifies how much time has elapsed from the start of the block of commercials until the onset of a particular commercial (i.e., 20 seconds, 30 seconds, 45 seconds, etc.). Because commercials differ in duration, the elapsed time until commercials in a particular ordinal position start may vary across blocks.

The presence of effects of ordinal serial position on consumer memory for television commercials is frequently expected (Brown and Rothschild 1993; Keller 1991; Kent and Allen 1994; Singh and Cole 1993) but is less frequently empirically examined (Burke and Srull 1988; Stewart et al. 1985). Research on the effect of elapsed time on memory for television advertising is absent, to our knowledge. We suggest that both ordinal and time-lag aspects of serial position affect consumer memory for television advertising.

Items in the first and last position of a sequence are generally remembered better than the items in the middle positions. The tendency to remember the first item in a sequence is known as the primacy effect, and the tendency to remember the last item is known as the recency effect (Crano 1977; Raaijmakers and Shiffrin 1992). Associative interference processes contribute to primacy and recency effects on memory for television commercials (Burke and Srull 1988; Waugh and Norman 1965). Specifically, the first commercial in a block is prone only to retroactive inhibition, and the last commercial is prone only to proactive inhibition, while commercials in the middle positions are penalized both by proactive and retroactive inhibition. Context-dependent memory processes may also contribute to primacy and recency effects on memory for television advertising (Murdock 1960; Greene 1986). Contextual theories propose that an item that contrasts with its context will stand out and is likely to be stored in memory with the context. When a person tries to recall this item, the context acts as a retrieval cue. If being the first or last in a block of commercials increases an ad's distinctiveness because of contrast, serial position acts as an effective episodic retrieval cue in recall (Baddeley 1990). The following hypothesis is tested:

> **H2:** Brand-name recall from blocks of television commercials will demonstrate positive primacy and recency effects.

Attention decrement theory (Anderson 1971) is related to the influence of elapsed time on attention and subsequent memory for items from a list. According to the theory, people generally pay close attention to early items and less attention to later items on a list. This leads to less distinctive memory traces, and hence to increased likelihood of retrieval failure, of later items. Attention decrement is a robust phenomenon, moderated only under specific conditions, such as when people expect a memory task (Yates and Curley 1986) or in the lab under high, uniform levels of attention (Keller 1991; Wells 1993). Even under these conditions, attention decrement may occur, as evidenced by a significant drop in the average time subjects take to review successive advertisements (Burke and Srull 1988, experiment 2). Attention decrement may be particularly large when watching television commercials at home (Krugman 1986), since consumers tend to be more interested in the program than in advertising. The following hypothesis is offered:

> **H3:** The time elapsed until the commercial's start in the block has a negative effect on brandname recall.

Hypothesis 2, regarding ordinal serial position effects, specifies both a primacy and a recency effect on memory. Hypothesis 3, regarding the effects of time lag, specifies a monotonic decreasing effect of time on memory. Jointly, ordinal and time-lag aspects of serial position produce a monotonic decreasing memory curve from the first com-

mercial, which is recalled best, to commercials in the middle of the block, to the last commercial, for which memory increases again. It is important to decompose serial position into its ordinal and time-lag aspects and to examine both aspects jointly: Not taking the time-lag aspect into account may lead to an underestimation of the recency effect, or even to a failure to find it, if the effect of elapsed time is substantial.

Commercials in a block compete for the consumer's attention and memory. Here we define the level of advertising competition as the total number of other commercials that appear in the same block as the target commercial. The level of advertising competition is expected to have a significant, negative influence on brand-name recall. Increasing the number of commercials in a block increases the likelihood of proactive and retroactive inhibition due to preceding and subsequent commercials, resulting in retrieval failure. In addition, with increasing levels of advertising competition, more commercials suffer from attention decrements. In an early study, mimicking a natural exposure situation with consumers, Webb and Ray (1979) found a negative impact of advertising competition on memory for television advertising. In a laboratory study with a student sample, Brown and Rothschild (1993) found no effect of advertising competition on consumer memory. Since our database was collected in real-life situations, with regular consumers, we expect to find the following:

> **H4:** The level of advertising competition has a negative effect on brand-name recall.

METHOD

Data Collection

There are three national public television stations in The Netherlands. All three carry advertising in blocks of commercials between programs, in particular before and after news broadcasts. Private stations that have serviced the Dutch market since 1990 carry both within- and between-program advertising.

Since February 1975, the Nederlands Instituut voor Publieke Opinie (NIPO)/Gallup market research company in Amsterdam has collected data about unaided and aided brand-name recall of television advertising in The Netherlands on a regular basis, under the name NIPO TV-Impact. The research is commissioned by advertisers and advertising agencies. New and old commercials across all categories of goods and services are included. Consumers watch the commercials at home, without knowing that they will be interviewed about the commercials afterward. Immediately after a particular commercial block has been broadcasted, about 60 trained female interviewers visit randomly sampled consumers throughout The Netherlands and interview them. Interviews start between 10 minutes and 30 minutes after a commercial block was on the air. An average of 175 consumers (about three per

interviewer) over 18 years of age are interviewed per commercial block.

From February 1975 until February 1992, consumer memory was assessed for television advertising in 224 commercial blocks. Analyses across all commercial blocks have not yet been performed. Since the average sample size per surveyed commercial block is 175, the present study is based on the responses of over 39,000 consumers. A total of 2,677 television commercials appeared in the 224 commercial blocks. Most commercials (96.7 percent) were carried by public stations in blocks around the 7:00 P.M. and 8:00 P.M. news.

Questionnaire

After establishing contact, the interviewer first inquires whether the consumer owns a television set and whether s/he has watched the complete block of television commercials broadcasted at X hours on station Y. If the answer to both questions is affirmative, the interviewer requests permission to enter and to ask a few questions about the commercials. Next, the following unaided brand-recall question is asked: "Which television commercials can you remember having seen in the respective block? Please name all commercials that you have seen." Responses are coded as correct if the consumer can recall both the brand name and the product category correctly (e.g., "Philips mixer") and as incorrect in other cases. Then, the aided brand-recall question is asked as follows: "Which of the following television commercials can you remember having seen tonight on station Y and at X hours?" The interviewer reads the names of the advertised brands and product categories (e.g., "Concordia insurance") in random order and records the responses of consumers on a standard form. Finally, additional questions are asked, and sociodemographic information is recorded. On average, the interview takes about 10 minutes to complete. Recognition data are not collected because the cost of producing pictorial cues and getting them in time to the interviewers across the country is prohibitive. Our analyses are based on the proportion of consumers that recall brand names when unaided and aided.

The method used by NIPO/Gallup controls for several variables that are known to affect brand-name recall and that could confound the results. The retention interval is held constant at 10–30 minutes (Shulman 1972), the type of program around which commercials appear (i.e., news) is held constant (Clancy and Kweskin 1971), commercial breaks are held constant as between-program breaks (Stewart et al. 1985), and exposure to the target commercials is held constant by screening subjects to ensure that they actually saw the commercials.

To ensure that serial position of commercials is not confounded with the quality of their messages or creative executions, we analyzed the content of 153 commercials appearing in 18 blocks in the years 1989–1991. Commercials were recorded on videotape in a single string such that breaks between blocks were absent. Five coders,

working independently in sound labs, indicated on five-point scales from "not at all" to "very strong" the extent to which they felt that each commercial on the tape was attractive, informative, and exciting. Two versions of the tape were used to control for order effects in evaluation. Treating coders as items, coefficients alpha were .60, .78, and .70, respectively, for "attractive," "informative," and "exciting," which was deemed adequate for the present purpose. Scores on the items were averaged across coders. Three one-way ANOVAs with items as dependent variables and serial position (first, middle, and last) as the independent variable revealed no statistically significant differences for "attractive" ($F(2, 151) = .009$, not significant [ns]), "informative" ($F(2, 151) = 1.747$, ns), and "exciting" ($F(2, 151) = 1.331$, ns). This ensures that potential differences between serial positions in brand-name recall are not due to differences in the appeal or strength of the commercial messages in the serial positions.

Multilevel Logistic Regression

Because commercials are nested within blocks, the variance in recall has a separate block component and a separate commercial component, and the explanatory variables lie on two different levels, the commercial level and the block level. In ordinary regression models, the hierarchical relationship between commercials and blocks is not taken into account, as data are pooled across blocks and commercials are treated as independent observations. Consequently, estimated standard errors of regression coefficients will generally be too small, and the risk of Type I errors inflated. Multilevel models (Bryk and Raudenbusch 1992; Goldstein 1995) explicitly account for the variance and effects at the commercial level and at the block level.

Since observed and predicted proportions of unaided and aided brand-name recall lie between zero and one, a logit transformation, $y = \text{logit}(p) = \log[p(1 - p)^{-1}]$, is applied to achieve a unit of measurement that is more linearly related to the independent variables (Neter, Wasserman, and Kutner 1985). In order to facilitate the logit transformation, the values of four commercials with an unaided recall proportion of 0.0 were replaced by 0.001.

First, variance in recall proportions is decomposed into variance within blocks and variance between blocks by a multilevel random ANOVA model without explanatory variables. From this, the intrablock correlation, which represents the proportion of variance in recall due to differences between blocks, is computed. If the intrablock correlation is substantial, continuation of the multilevel approach is worthwhile (Bryk and Raudenbusch 1992; Goldstein 1995). In that case, a two-level random-intercept model is specified to explain variance in recall proportions from variables at the commercial level and at the block level. The following explanatory variables are included in the model:

X_{1ij} = duration of commercial i in block j in seconds;
X_{2ij} = primacy effect, an effects-coded variable distinguishing the first commercial in block j (1) from the rest (-1);
X_{3ij} = recency effect, an effects-coded variable distinguishing the last commercial in block j (1) from the rest (-1);
X_{4ij} = time elapsed from the start of block j until the onset of commercial i (in minutes); and
X_{5j} = advertising competition, the total number of other commercials in block j.

The explanatory variables X_{1ij}, X_{2ij}, X_{3ij}, and X_{4ij} are at the commercial level, while X_{5j} is at the block level. Accordingly, the following full multilevel logistic regression model is

$$\text{logit}(p_{ij}) = \beta_0 + \beta_1 X_{1ij} + \beta_2 X_{2ij} + \beta_3 X_{3ij}$$
$$+ \beta_4 X_{4ij} + \beta_5 X_{5j} + e_{ij} + u_j, \qquad (1)$$
$$i = 1, \ldots, N_j, \quad j = 1, \ldots, M,$$

where p_{ij} is the observed proportion of consumers who recall, unaided or aided, commercial i in block j, e_{ij} is the error term at the commercial level, u_j is the error term at the block level, N_j is the number of commercials in block j, and M is the number of blocks. We assume $e_{ij} \sim N(0, \sigma_e^2)$, $u_j \sim N(0, \sigma_u^2)$, and the error terms to be uncorrelated. Equation 1 contains eight parameters to be estimated, the six fixed coefficients β_0–β_5, and the variances σ_e^2 and σ_u^2. Parameters of the multilevel random ANOVA model and the multilevel logistic regression model are estimated by iterative generalized least squares (Goldstein 1995) with the program MLn (Rasbash and Woodhouse 1995), assuming that the logit-transformed proportions follow a normal distribution.

RESULTS

There were no systematic changes in the duration of commercials or the size of commercial blocks over the years (1975–1992). Average duration of commercials in the observation period varies around 25 seconds, and the average number of commercials in blocks varies around 12. Systematic increases or decreases in aided and unaided brand-name recall over the years were absent as well. Summary information of the commercials and brand-name recall is provided in Table 1.

Results of the multilevel ANOVA are offered first. The estimated variance components for unaided brand-name recall for the commercial level and the block level are .433 (SE = .012, $p < .001$) and .081 (SE = .011, $p < .001$), respectively. Estimated variance components for aided brand-name recall for the commercial level and the block level are .301 (SE = .009, $p < .001$) and .054 (SE = .008, $p < .001$), respectively. This indicates that while most variance in brand-name recall proportions is at the commercial level (84.2 percent for unaided and 84.8 percent for aided recall), a substantial part is at the block

TABLE 1

SUMMARY INFORMATION ABOUT COMMERCIALS
AND BRAND NAME RECALL

Measures	Mean	SD	Minimum	Maximum
Duration (seconds)	26.5	8.1	10	90
Elapsed time (minutes)	2.6	1.7	0	6.6
Block size (n)	12.7	2.7	4	17
Unaided brand name recall (%)	26.9	12.0	0	82
Aided brand name recall (%)	60.8	12.6	1	93

level (15.8 percent for unaided and 15.2 percent for aided recall). As both variance components differ significantly from zero and contribute notably to the total variance, the multilevel analysis is continued. Results of the multilevel logistic regression models are presented in Table 2. Incremental R^2-values, that is, differences in R^2 between analyses with and without a particular explanatory variable, are indicated as measures of effect size.

In combination, the explanatory variables account for 27.2 percent of the variance in unaided brand-name recall and for 17.8 percent of the variance in aided brand-name recall. By comparing the data in Table 2 for random variation at the commercial level and the block level with those from the multilevel ANOVA, the variance accounted for on each of the levels in the analysis can be determined. A total of 21.5 percent ([1 − (.340/.433)] × 100) of the variance in unaided brand-name recall and 12.0 percent ([1 − (.265/.301)] × 100) of the variance in aided brand-name recall at the commercial level is accounted for by the duration of the commercial, the effects of serial position, and advertising competition. A total of 55.6 percent ([1 − (.036/.081)] × 100) of the variance in unaided brand-name recall and 50.0 percent ([1 − (.027/.054)] × 100) of the variance in aided brand-name recall at the block level is accounted for by advertising competition. Hence, about half of the variation in brand-name recall at the block level is accounted for by advertising competition only.

The effects of the explanatory variables, as estimated in the multilevel logistic regression model, support the hypotheses. Brand names in longer commercials are recalled significantly better, both unaided and aided, than brand names in shorter commercials. The effect size of duration is large, as indicated by the increment in variance accounted for in both unaided (13 percent) and aided brand-name recall (9 percent). The hypothesized positive primacy and recency effects emerge for unaided but not for aided brand-name recall, and the effect sizes on unaided brand-name recall are small (0.3 percent for primacy and 0.1 percent for recency). The expected negative effect of elapsed time emerges on unaided but not on aided brand-name recall, with a modest effect size of elapsed time on unaided brand-name recall (1.2 percent). The hypothesized negative effect of advertising competi-

tion on unaided and aided brand-name recall emerges, and the effect size is substantial for both unaided (7.3 percent) and aided brand-name recall (6.6 percent). The effect size of the commercial's duration is highest, followed by the effect size of advertising competition, the effect size of elapsed time, and finally the effect sizes of primacy and recency.

To emphasize the importance of testing the ordinal and time-lag aspects of serial position simultaneously, we performed an additional analysis without the elapsed-time variable. As expected, the recency effect decreased and became nonsignificant ($\beta = -.024$, SE = .021; overall R^2 for unaided brand-name recall = .260), while the size of the primacy effect on unaided brand-name recall doubled ($\beta = .150$, SE = .021).

The effects of duration, primacy and recency, elapsed time, and advertising competition on unaided and aided brand-name recall proportions are graphically displayed in Figures 1–4. In each of the four figures, substantial shifts in unaided and aided recall due to the explanatory variables can be observed. For example, let a particular commercial, A, have a duration of 60 seconds, positioned at the beginning of a block with six commercials, and let commercial B have a duration of 20 seconds, positioned in the middle of a block with 14 commercials (each starting four minutes after the beginning of the block). The percentages of consumers who show unaided and aided brand-name recall differ substantially between the two commercials, namely, 65.6 and 82.4 percent, respectively, for commercial A, versus 18.0 percent and 55.5 percent for commercial B. This demonstrates that the statistical significance of the effects obtained in the present study is not simply due to the power of the tests.

Interactions

As some interactions between the explanatory variables have no meaning (e.g., primacy × elapsed time, primacy × recency), a total of eight interactions are considered. Four interactions between duration and each of the following—primacy, recency, advertising competition, and elapsed time—are determined; three additional interactions between advertising competition and each of the following—primacy, recency, and elapsed time—are considered, as well as the interaction between recency and elapsed time. Interaction variables are added to the multilevel logistic regression model one at a time. The significance of an interaction effect is tested with the difference in log likelihood, which is chi-square distributed with one degree of freedom (Bryk and Raudenbusch 1992), and incremental R^2-values are interpreted as measures of effect size.

Three out of eight interactions for unaided brand-name recall and two out of eight interactions for aided brand-name recall are significant, but all effect sizes are quite small. The interaction between duration and recency is statistically significant both for unaided brand-name recall

TABLE 2

MULTILEVEL LOGISTIC REGRESSION ANALYSIS ON UNAIDED AND AIDED BRAND-NAME RECALL

Explanatory variables	Unaided brand-name recall		Aided brand-name recall	
	Parameter (SE)	R^2 increment	Parameter (SE)	R^2 increment
Fixed:				
Constant	−.981*** (.087)		.513*** (.076)	
Duration	.032*** (.001)	13.1	.022*** (.001)	9.2
Primacy	.069** (.023)	.3	−.019 (.020)	<.1
Recency	.055* (.023)	.1	−.003 (.020)	<.1
Elapsed time	−.067*** (.009)	1.2	−.014 (.008)	<.1
Advertising competition	−.060*** (.006)	7.4	−.053*** (.006)	6.8
Random:				
Commercial level (σ_b^2)	.340*** (.010)		.265*** (.008)	
Block-level (σ_u^2)	.036*** (.006)		.027*** (.005)	
R^2	.272		.177	
−2 Log Likelihood	4891.63		4219.11	
Number of parameters	8		8	

*$p < .05$.
**$p < .01$.
***$p < .001$.

($\beta = -.009$, $\chi^2 = 12.31$, $p < .001$, incremental $R^2 = 0.3$) and for aided brand-name recall ($\beta = -.004$, $\chi^2 = 4.17$, $p < .05$, incremental $R^2 = 0.1$). The negative sign of the parameters expresses that in comparison with longer commercials, shorter commercials benefit more from the recency effect. The interaction between duration and advertising competition is statistically significant for unaided brand-name recall ($\beta = .002$, $\chi^2 = 9.52$, incremental $R^2 = 0.3$) but not for aided brand-name recall ($\beta = .001$, $\chi^2 = 2.48$, incremental $R^2 = 0.1$). The positive sign of the parameter for unaided brand-name recall expresses that while the overall unaided recall of shorter as compared to longer commercials is significantly lower, the drop in recall under increasing levels of advertising competition is larger for longer than for shorter commercials. The interaction between elapsed time and advertising competition is statistically significant both for unaided brand-name recall ($\beta = .008$, $\chi^2 = 7.61$, incremental $R^2 < .01$) and for aided brand-name recall ($\beta = .007$, $\chi^2 = 6.96$, incremental $R^2 = 0.1$). The positive sign of the parameters expresses that at high levels of advertising competition, brand-name recall for all commercials is low and less dependent on the elapsed time until a commercial starts in the block, although at low levels of advertising competition brand-name recall for commercials that start early in the block is significantly higher than brand-name recall of commercials that start later in the block. Since the interaction between primacy and general competition is not significant, the effect is due to elapsed time and not to being the first in the block.

DISCUSSION

In this study, we demonstrate that a commercial's duration has a large positive effect, and the level of advertising competition has a sizable negative effect, on unaided and aided brand-name recall. In addition, the elapsed time from the start of a commercial block until the onset of a particular commercial has a significant negative effect on unaided brand-name recall, while the first and last commercial have significant advantages over intermediate ones in terms of unaided brand-name recall. Duration has the largest effect size, followed by advertising competition, elapsed time, and finally primacy and recency. The advantage of the last commercial only emerges when the effect of elapsed time is controlled for. Multilevel regression analyses show that 85 percent of the variation in brand-name recall originates from the individual commercials, and about 15 percent from the block of commercials. The explanatory variables jointly account for 27 percent of the variation in unaided brand-name recall and for 18 percent of the variation in aided brand-name recall, which is substantial given that only noncontent information of commercials was available and that the data were collected among consumers in the marketplace under natural conditions across product categories and time.

Although previous research has emphasized the ordinal aspect of serial position, our findings emphasize the importance of decomposing serial position into its ordinal aspect (i.e., whether a commercial is first, intermediate, or last in the block) and its time-lag aspect (i.e., how many seconds after the onset of a commercial block a particular commercial starts). Both aspects of serial position have significant effects on unaided brand-name recall, and the recency effect disappeared when the elapsed-time effect was not accounted for. Not accounting for the time-lag aspect of serial position leads to an overestimation of the primacy effect and an underestimation of the recency effect.

The significant impact of serial position on unaided but

FIGURE 1

EFFECT OF COMMERCIAL DURATION ON UNAIDED AND AIDED BRAND-NAME RECALL
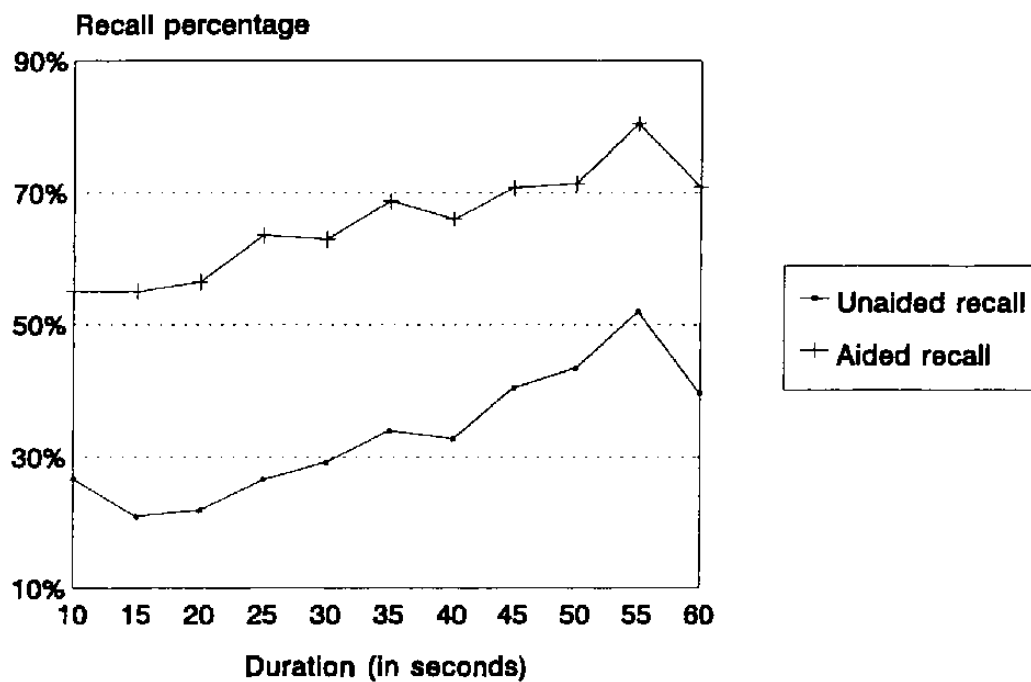
FIGURE 2

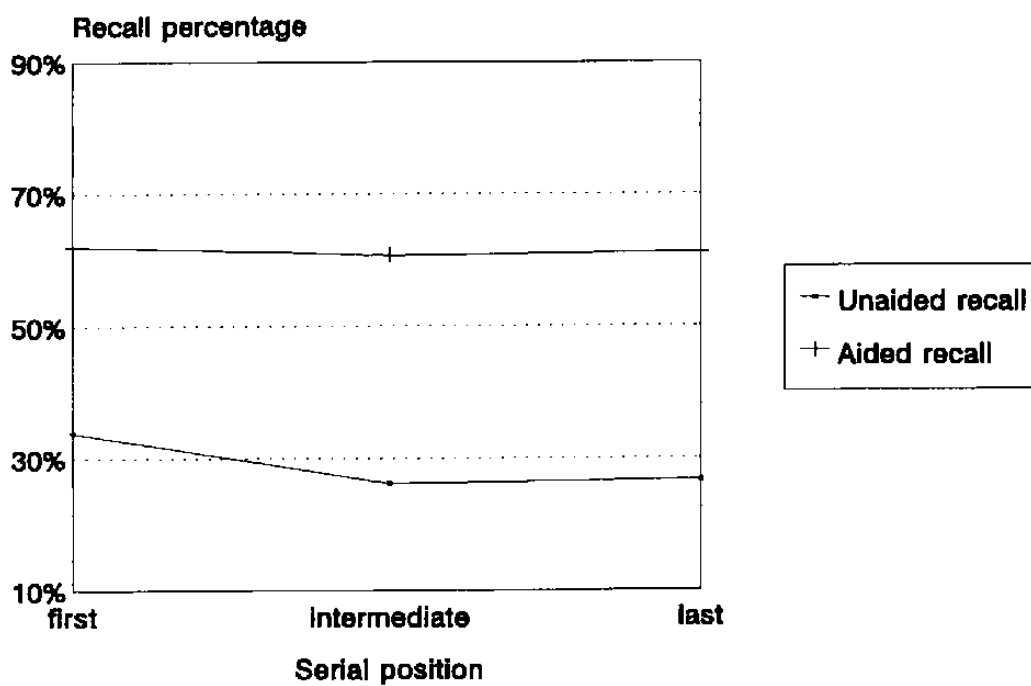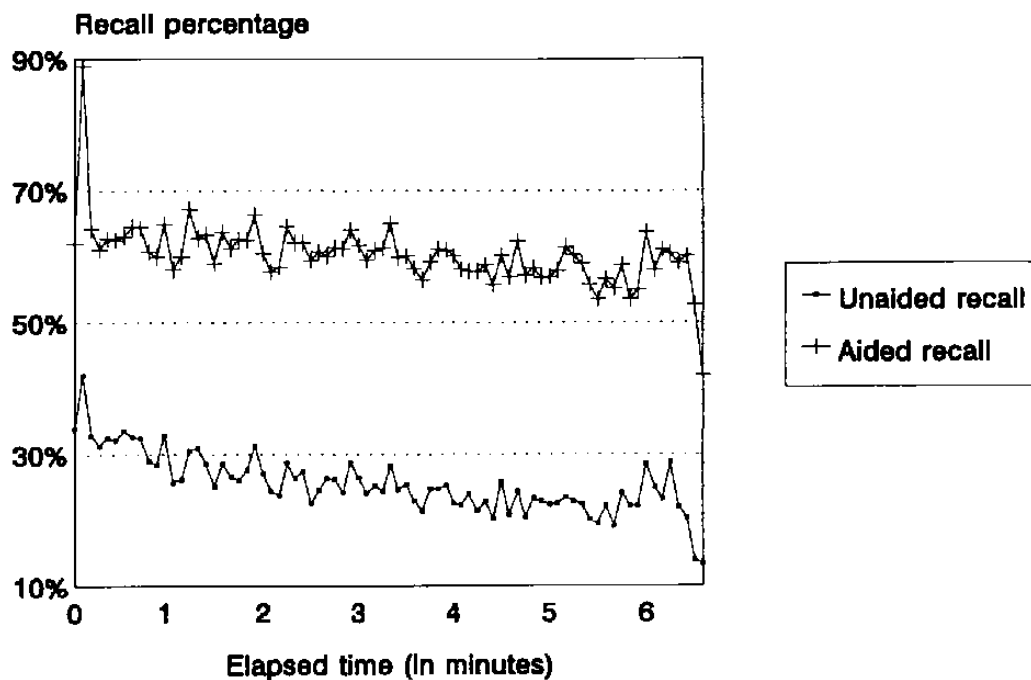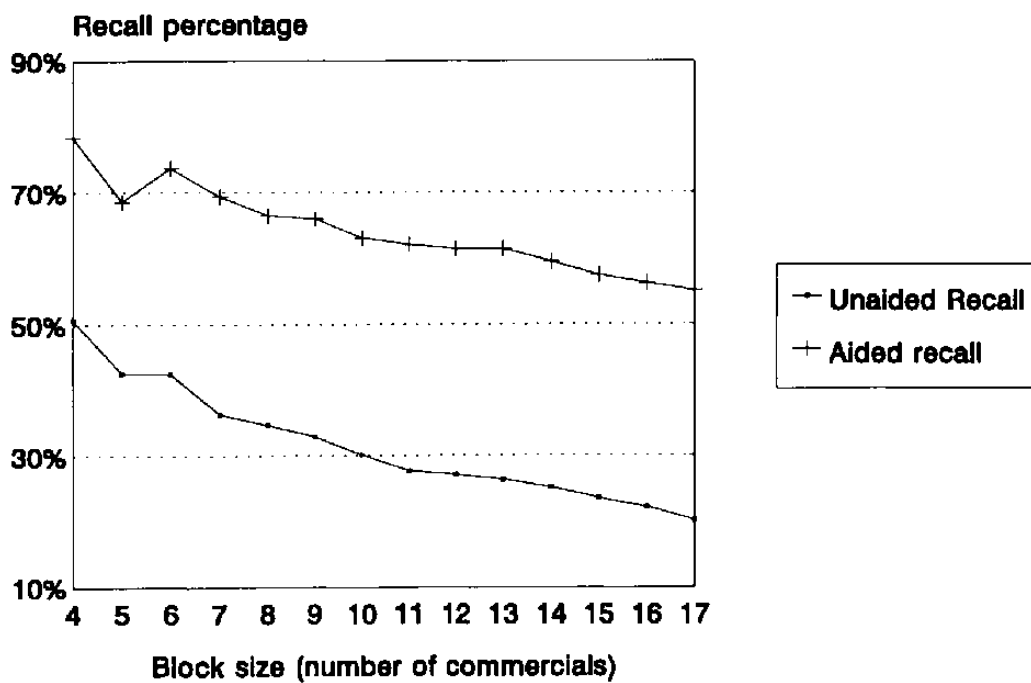EFFECT OF PRIMACY AND RECENCY ON UNAIDED AND AIDED BRAND-NAME RECALL

FIGURE 3

EFFECT OF ELAPSED TIME ON UNAIDED AND AIDED BRAND-NAME RECALL

Recall percentage

Elapsed time (in minutes)

FIGURE 4

EFFECT OF NUMBER OF COMMERCIALS IN THE BLOCK ON UNAIDED AND AIDED BRAND-NAME RECALL

Recall percentage

Block size (number of commercials)

369

not on aided brand-name recall may be due to calibration. If unaided and aided recall require different cognitive resources, and if some of the predictors, such as duration and competition, provide more of the required resources than others (e.g., serial position), the latter predictors may affect only the less resource-demanding memory measures, while the former predictors affect both. Hence, a stronger manipulation of serial position may have led to significant effects on aided brand-name recall as well. Future research may determine the contribution of calibration and other mechanisms in accounting for differences in the memory effects obtained.

Previous research has focused on main effects of duration, advertising competition, and serial position. Our results indicate that from a substantive perspective this is defensible, since few interactions were statistically significant and the effect sizes were very small. Although the obtained significant interactions are in line with a general signal-to-noise or distinctiveness-and-interference explanation of memory effects (Keller 1991), future experimental research is needed to uniquely attribute significant interactions to specific attentional and memory mechanisms.

The contributions of this study must be interpreted in the light of several limitations. First, since only measures of unaided and aided brand-name recall were available in the database, the scope of the results is limited to memory effects. Brand-name recall is a good measure of a commercial's ability to attract attention and generate interest (Stewart et al. 1985), but it may not be predictive of the commercial's persuasiveness (Beattie and Mitchell 1985; Ross 1982). Therefore, the conclusions pertain to memory effects of the variables under study, not to persuasion effects.

A second limitation concerns the generalizability of results across exposure situations. Since only consumers who had seen the complete block of commercials were included in the study, the drawbacks of being in the middle of an ad block may be underestimated. This underestimation is a function of the number of consumers that evade the block (shortly) after the start, and it implies that the decrease in brand-name recall from the first to subsequent commercials will generally be higher in real life than in our database.

Implications and Future Research

Our results may have implications for media planning practice. Frequently, advertisers have control over the duration of commercials, and they can determine in which blocks commercials are placed, as well as the serial position of commercials in blocks. Because such control may come at a price, memory effects of various durations, serial positions, and levels of advertising competition should be balanced against their associated costs. Although any calculation of the cost effectiveness of specific placement strategies should be done with great caution in view of the limitations of our study, we present some

illustrative examples based on main effects findings, as these had the largest effect sizes. In The Netherlands, using the price of 30-second commercials as the standard (i.e., at 100), 45-second commercials are priced at 145 percent, while 15-second commercials are priced at 60 percent (Stichting Ether Reclame [STER] 1995). The unaided and aided brand-name recall of 45-second commercials in our database are 138 percent and 112 percent, respectively, of the 30-second commercial recall. Unaided and aided brand-name recall of 15-second commercials are, respectively, 88 percent and 72 percent of 30-second commercials. The results suggest that in The Netherlands, when targeting brand-name recall and related communication goals, shorter commercial durations may be relatively more cost effective than longer ones.

Several countries allow advertisers to select specific positions in blocks of commercials. Advertisers on public networks in France can chose the first, second, last, or one-before-last position, at a premium of 15 percent. In the United Kingdom and The Netherlands, any position in a block can be chosen, at a premium of 15 percent in the United Kingdom and 10 percent in The Netherlands. In our database, relative to commercials in the middle positions, unaided and aided brand-name recall of the first commercial in a block are, respectively, 129 percent and 102 percent, and unaided and aided recall of the last commercial are, respectively, 101 percent and 101 percent. This suggests that when brand-name recall and related communication goals are targeted in The Netherlands, it may be worthwhile to place commercials in the first position in commercial blocks.

To our knowledge, advertisers usually cannot directly control the size of the block in which their commercials appear (other than by buying the complete block), and price differentiation with respect to different block sizes does not exist. On the basis of the present findings, advertisers with a choice may consider placing their commercials in short blocks. In the present database, the average number of commercials per block, and therefore the level of advertising competition, is larger than it usually is in the United States. Although shorter blocks of within-program advertising are on the increase, television advertising on public networks in Europe is still frequently placed in relatively long blocks between programs. For instance, in France, the average number of commercials per block for between- and within-program advertising combined, and across public and private networks, was 6.4 in 1993. In Italy, the average was 6.2, and in Germany it was 5.6 (Initiative Media International 1995). The analyses indicate that, although the average number of commercials per block is typically higher in Europe than in the United States, harmful effects of advertising competition occur across the whole range of competition levels and that they are already substantial when the number of commercials in a block increases from four to five.

Although advertisers do not exert direct control over the size of the block in which their commercials appear, they can indirectly control the size of the block, given a

certain prespecified duration of a commercial block, by manipulating the duration of their own commercials. The trend in the United States has been toward shorter but more numerous commercials per block. This has led to high levels of competitive clutter. Given the relative short durations of blocks in the United States, the use of a 60-second commercial instead of a 15-second commercial could reduce block size significantly. Direct effects of increasing commercial duration on consumer memory, combined with indirect effects through reduced block size, may counterbalance the relative advantages of shorter commercials. Although managers know this, they may not fully realize the trade-offs that this article helps to illuminate.

An interesting area for future research concerns advertising exposure schedules. Memory research suggests that the time interval between items on a list—the interpresentation interval—has a positive effect on memory (Neath 1993), as longer interpresentation intervals keep items better separated in memory. In a related study, Singh et al. (1994) found that longer interpresentation intervals between repeated exposures of the same commercial improved memory of the commercial. In our database, we found substantial competition effects in between-program blocks from four to 17 commercials. In contrast, Brown and Rothschild (1993) found no competition effects for commercials placed in five blocks of two, three, or four commercials in a 30-minute program, although the number of commercials varied between 10 and 20. Perhaps the long interpresentation intervals between the smaller blocks moderated memory effects of advertising competition. In view of the increasing levels of advertising competition, it seems particularly valuable to examine the effect of interpresentation intervals on consumer memory for television advertising in the laboratory as well as in the marketplace.

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