How effective is advertising in real markets?

Researchers have been studying the effectiveness of advertising in real markets, since managers started using advertising to influence consumer behaviour. However, knowledge about advertising's effects in real markets has grown rapidly in the last 50 years, after researchers began to combine scientific methods of experimentation with econometric and statistical analyses of real market data. Researchers have published their findings in journals of advertising, consumer behaviour, marketing, management, psychology, and economics. As such, they have spawned a vast, rich body of knowledge of how advertising works.

What have we learnt from this vast body of research?

Actually, we have learned quite a bit. Some of this learning has been replicated again and again, so that we can claim to have some generalization or even precise metrics about the effects of advertising. On other issues, we have a growing consensus but no clear metrics. On a third set of issues, because of limited research and little or no consensus, we have only a preliminary understanding.

Two paradigms have researched the effects of advertising: the behavioural paradigm and the modelling paradigm. The behavioural paradigm has primarily examined the effects of advertising content on mental processes (such as recognition, recall, attitude, persuasion, brand liking, or brand equity). This paradigm has predominantly used laboratory experiments or theatre tests. Because an experiment involves a careful design of variables in an artificial environment, it provides a strong test of causality but is low on relevance to real markets. Section 2 of this handbook reviews the major findings from this research paradigm.

The modeling paradigm has primarily examined the effects of advertising intensity on market behaviour. Advertising intensity has been measured by a brand's advertising expenditures, gross ratings points, or ad exposures delivered to the market. Market behaviour has been measured by a brand's unit sales, revenues, choices, or market share (in units or revenues). The method of analysis has been field experiments (Chapter 4.1) or econometric models (Chapter 4.2 and Chapter 4.3). Because econometric models typically use real market data, which may not be easily controlled, they are strong on relevance but weak on ascertaining causality.

Neither the laboratory experiment nor the econometric approach is universally superior by itself. However, the market experiment represents a nice hybrid. If properly designed, it can combine the strengths of the laboratory experiment and the econometric model without being straddled with their limitations. A hybrid approach also has the strength of determining advertising's impact on the mental processes (to help copy design) and on sales (to help budgeting).

This chapter reviews the findings from studies that have used econometric models or market experiments and have all been carried out in real markets. It presents the learning from published market studies that used the tools and methods explained in Chapter 4.1, Chapter 4.2, and Chapter 4.3. However, it does not cover the study of the unique database of award-winning ads described in Chapter 3.4. It also does not cover those studies that assess the effect of advertising on price or brand equity as an end in itself (see Chapter 1.4; Ambler, 2004; Ambler and Hollier, 2005).

The chapter is divided into three parts. Part A deals with the effects of advertising intensity. Part B deals with the dynamic effects of Advertising. Part C deals with the content effects of advertising. The chapter does not cover the effects of advertising reach (Vakratsas and Ambler, 1999). At the end, the chapter summarizes what
we have learnt in each of these areas.  

**PART A: EFFECTS OF ADVERTISING INTENSITY IN MARKETS**

**Classification of studies**

Researchers have carried out a vast number and variety of studies on this topic. To meaningfully organize this body of research and summarize the main findings, we need some basis by which to classify them. The focus of various studies provides such a basis. Most of these studies focus on one or more of three aspects of advertising intensity: weight, elasticity, or frequency (see Table 4.4.1).

**Weight studies** examine the effects of *differences in the advertising* across time periods or across regions. **Elasticity studies** examine the effects of *changes in advertising* from period to period within a region. **Frequency studies** examine the effects of *changes in ad exposures* targeted to consumers from period to period within a region.

| Table 4.4.1 Description of studies on advertising intensity |
|----------------|-----------------|-----------------|-----------------|
| **Type of study** | **Ad weight** | **Ad elasticity** | **Ad frequency** |
| Independent variable ad budget | Increase or decrease in total from period to period | Variation of ad budget | Variation of ad exposures from period to period |
| Target | Total market or segment | Total market or segment | Consumer or household |
| Response (dependent variable) | Sales, Revenues, or market share | Sales, Revenues, or market share | Sales or choices |
| Metric of Effectiveness | Change in response if any | Elasticity of response to advertising | Effective frequency at which response peaks |

**Source**: Adapted from Tellis (2004).

These three aspects of advertising effectiveness are related. The total advertising budget in a time frame determines how much can be applied from period to period in that time frame. The period budget determines how many exposures are targeted to individual consumers in that period. However, they differ in three important ways. Frequency studies provide the best understanding of how advertising works in persuading consumers to act. Elasticity studies provide less understanding than frequency studies on this dimension, while weight studies provide the least understanding. On the other hand, the implications of weight studies are transparent in terms of actionable guidelines for managers. The implications of elasticity studies are less transparent than those of weight studies. The implications of frequency studies are the least transparent of the three.

Ideally, these three aspects of advertising should be examined simultaneously in one study. However, because response to advertising is complex, researchers have focused on only one or at most two of these aspects at a time. On each of these aspects, we have a stream of research and a small body of findings. To compare studies within a stream and arrive at potential generalizations, this chapter summarizes the findings separately by these three types of studies.

**Studies of advertising weight**

**Explanation of terms and studies**

Several studies sought to determine whether increases or decreases in advertising weight have any effect on sales and market share (Tellis, 2004). If increases in advertising weight lead to increases in sales and profits that more than compensate for the additional cost of advertising, then the brand needs to stay with that increase. Similarly, if decreases in advertising weight do not lead to decreases in sales and profits that exceed the savings from the lower weight, then the brand needs to stay with the lower weight. Studies that have researched this issue have done so through various market tests.

We need to define some commonly used terms in such market experiments: weight, copy, media, schedule, and audience tests. The word *test* means a specific experiment. A *weight test* is a market experiment in which the researcher compares the effect of advertising between two or more markets, each at a different level of intensity of advertising. Typically, one of these test markets has the level of advertising that the firm currently uses. This market is called the control condition. The other markets are called the test conditions. In the spirit of good experimentation (see Chapter 4.1), *all other factors are kept as similar as possible between the conditions.*
The dependent variable in these tests typically is sales (or market share). The goal of a weight test is to see whether the increase or decrease in the level of advertising alone has any effect at all on sales. In addition to weight, other aspects of advertising that researchers also test are copy, media, audience, and schedule. When testing the effect of any other aspect of advertising, the researcher must keep all other factors constant between the test conditions. Researchers can vary two or more variables (e.g., weight and copy) at a time. However, to obtain a valid experiment, the number of conditions rapidly goes up as the product of the levels of the factors. For example, to validly test two levels of weights with 3 levels of copy, the researcher will need $2 \times 3 = 6$ conditions. The term copy, in this section, refers broadly to any changes in the content of the ad.

Researchers have carried out over 450 market experiments to assess the effectiveness of advertising. Six sets of experiments are especially instructive about the effects of advertising on sales. These experiments were associated with Anheuser-Busch, Grey and D’Arcy Advertising, AdTel, Campbell Soup, and Information Resource Inc. In addition, two advertising researchers (Aaker and Carmen, 1982) review the first three of these studies as well as several smaller experiments. The following subsections describe key features of these studies and summarize their main findings.

Ackoff and Emshoff (1975) describe an interesting set of experiments at Anheuser-Busch, Inc, for the Budweiser brand of beer, in the mid 1960s. The experiments varied advertising levels, pulsing patterns, media, and other promotional activity. The most elaborate of these experiments involved changes in advertising weight of $-100\%$, $-50\%$, $-25\%$, $0\%$, $+50\%$, $+100\%$ and $+200\%$ relative to current expenditures. Each level was tried over six areas for greater confidence in the results. The experiments showed that in the short term decreasing the level of advertising had no negative impact on sales. The authors attributed the response pattern to the over saturation of primary segments with past advertising of the brand. They found that suspension for more than a year led to some deterioration in sales. In these situations, the sales levels and sales growth could be restored with just the previous (normal) advertising level. These results suggest the use of scheduling, in which a firm stagers normal levels of advertising with periods of complete suspension of all advertising (also called flighting, see Chapter 5.4). Cost for advertising can be lower with the suspension, while advertising can be re-started as soon as sales seem to erode.

As regards the effectiveness of different media, they found no significant difference between radio, magazines, and newspapers. However, they found that television was slightly superior to the other media, while billboards were slightly inferior. They also found that promotional expenditures were close to the optimum. Careful implementation of their recommendations led to a decrease in advertising expenditures from $1.89$/barrel to $.8$/barrel with a corresponding sales increase from 7.5 million to 14.5 million barrels.

**Review of field experiments**

Aaker and Carmen (1982) summarized the results of 120 AdTel experiments in three cities during the 1960s and 1970s, in which AdTel controlled advertising by varying either ad-levels or ad-content to subgroups in each city. Of the 120 tests, 48 were weight tests and 36 were copy tests. Six of the 48 weight tests involved lower levels of advertising. However, none of these six tests showed any decline in sales. Of the 42 remaining tests (involving increased advertising), 30% showed sales changes that were different from the control groups. Most of the latter tests were for new products. In contrast, 47% of the copy tests showed significant differences in sales between test and control groups.

Aaker and Carmen (1982) report on a total of 11 experiments conducted by Grey Advertising and D’Arcy Advertising. Overall, this set of experiments showed that advertising increases were effective in about half the experiments, while an advertising decrease had no deleterious effect in sales in the one place it was tested.

Aaker and Carmen (1982) also analysed a total of 69 other experiments. Eleven of these tests involved adreduction in advertising, some for 2 years or more. Almost all (10 of 11) of these experiments indicated that such reductions in advertising had no deleterious effects on sales. Of the remaining 58 experiments, only a minority of the experiments showed that increases in advertising were sufficiently effective in increasing sales so as to justify an increase in the advertising budget for the tested brand.

Eastlack and Rao (1989) reported a series of 19 advertising experiments on the sales of six brands of the Campbell Soup Company in the mid 1970s. The experiments varied factors such as advertising weight ($-50\%$ to $+50\%$), scheduling, media, copy, and target market. The experiments show that changes in advertising weight had little or no impact on sales. However, changes in copy, media, and target markets did result in sales increases in some situations. Whenever sales increased significantly, the increase occurred early on rather than after prolonged repetition.

Magid and Lodish (1989) and Lodish et al. (1995a, 1995b) summarized over 389 advertising tests conducted over the last 10 years of BehaviourScan Advertising Tests at Information Resources Inc. (IRI) (see Chapter 4.3). For 49% of the weight tests, increased advertising yielded significantly higher sales at the 80% level of significance. The number of test results that would be significant at the 95% level is likely to be substantially lower, but the authors do not report that number. Even when the advertising was effective at this level of significance, it was found to be profitable (within the medium term of one year) in only 20% of the cases. An important finding, which echoes that from prior studies, was that massive increases in advertising weight were not more likely to yield better sales responsiveness than moderate increases. Increases in advertising were more likely to lead to increase in sales when the copy strategy is changed or the brand is in a growth stage. Advertising was much more effective for new products than for mature or established products. Most
importantly, if advertising were not effective early on, then it would never be effective, even if it were repeated.

**Implications**

The review of experiments is important because of its scope. It covers 450 experiments, by numerous investigators, using a variety of brands, contexts, and time periods. The review indicates that for many mature brands, advertising weight, or the level of TV advertising per se is not critical in influencing sales. More than half the time, increases in weight alone do not lead to an increase in sales. However, neither do decreases in weight lead to sales decline, at least in the short to medium term. On the other hand, changes in other factors (media, copy, product, segments, or scheduling) could influence the effectiveness of advertising. In general, novelty in any of these factors may lead to an increase in sales.

Tests that involve a reduction in advertising do not typically lead to a decrease in sales immediately. That could mean that past advertising has some carryover effect that does not decline immediately. Alternatively, it could mean that firms are overadvertising, so that the recent advertising was not effective at all. Prolonged cessation of advertising seems to have deleterious effects in some tests but no negative effects in other tests. What has not been studied is whether deleterious effects from cessation can be quickly corrected by fresh advertising. Thus, firms should be very careful about complete cessation of all advertising for prolonged periods of time. If they do so, they need to monitor the effects of such changes closely for a long period of time.

Thus the overall message from these studies is that advertisers may be overadvertising, at least in targeting the same segments with the same copy, media, schedule, and product. This situation would be exacerbated if advertisers resorted to further increases in advertising weight alone in these conditions.

The experiments indicate that advertising may have carryover effects, though there is less unanimity about the pattern of these effects. Most importantly, if advertising has any effect, that effect is visible early on. If it has no effect early on, then it is unlikely to have an effect with further repetition. On the other hand, when advertising is effective and maintained over a period of a year, its effects could last at least for two more years. In these cases, the effect in the latter two years could equal that in the first year.

While experiments provide a strong, clear test of causality, they suffer from the limitation of not being carried out in an entirely natural setting or taking into account other competitive activities. The following set of market studies compensates for this weakness in experiments.

**Studies of advertising elasticity**

**Explanation of terms and studies**

**Advertising elasticity** is the percentage change in sales (or market share) for a 1% change in the level of advertising. Because the numerator and denominator are in percentages, elasticity is units free (i.e., independent of the units of sales or advertising). It can also be called the elasticity of sales to advertising. Researchers estimate advertising elasticity by analysing the differences in sales or market share due to differences in advertising budget from period to period within a time frame.

Like weight tests, studies on advertising elasticity also focus on the advertising budget. However, studies of advertising elasticity go beyond the weight tests in that they determine the shape and strength of the advertising response function. Typically, researchers express this shape as a particular mathematical function (see Chapter 4.3) and the strength as an elasticity. To do so, researchers use some econometric model of the effect of advertising on sales or market share.

Researchers have conducted a vast number of studies of advertising elasticity. Most of these studies have used naturally occurring market data from research firms or advertisers themselves. However, some of the studies have also generated data through market experiments of the type described above.

Various reviews and meta-analyses have tried to summarize the findings from the original econometric models of advertising response. A literature review briefly describes each original study and summarizes the results across studies. In contrast, a meta-analysis is a study that treats the findings from original studies as dependent observations, which are then pooled together and analysed by the characteristics of those original studies.

**Review of studies**

There are at least two major reviews and two major meta-analyses of the effects of advertising on sales. We review only the two meta-analyses, for one important reason. The two meta-analyses are comprehensive enough that they encompass the scope and findings of the two reviews. We first provide a brief explanation of the meta-analytic approach and then present the results of the meta-analyses.

The common mean of advertising elasticity across all the studies gives the best estimate of the effect of advertising in the population, i.e., across all contexts and research designs. Indeed, by the early 1990s, a variety of primary studies yielded over 400 estimates of the advertising elasticity. One formal approach for analyzing these estimates is a meta-analysis.

The meta-analytic approach determines the mean of these elasticities and its systematic variation, if any, due to differences in design or contexts of the primary studies. Assmus et al. (1984) conducted a meta-analysis of 128
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Econometric models from primary studies that analysed the impact of advertising on sales or market share. Their major findings were the following:

- The grand mean for the advertising elasticity was 0.2.
- The grand mean for the carryover elasticity of advertising was 0.5.
- Short-term elasticities were much lower in models that incorporated a carryover coefficient (a lagged dependent variable) than in models without one.
- Models that contained exogenous variables had smaller short-term elasticities than those that did not.
- Elasticities in linear additive models were higher than those in multiplicative models (see Chapter 4.3) for different types of models.
- Pooled data involving cross-sectional observations in addition to time series observations, yielded higher elasticities.
- Food products have an elasticity that is .1 higher than other products.
- Elasticities were significantly higher for Europe relative to the US.
- Elasticities did not differ by measure of the dependent variable (sales or market share), by product or brand, by type of estimation method.

Sethuraman and Tellis (1991) and Tellis (1988b) carried out a more recent meta-analysis of advertising elasticities than the one above. Their study covered 260 primary estimates of the elasticity of sales or market share to advertising. Their major finding is that the average elasticity across all 260 estimates is 0.11. This estimate is half that of Assmus et al. (1984). The authors attributed the differences to their larger and more recent sample.

What does this number of 0.1 mean? Strictly, an elasticity of 0.1 means that a 1% increase in the level of advertising results in only about a 0.1% increase in sales. Empirically, the authors also compare this advertising elasticity with the corresponding price elasticity obtained from primary studies that estimated both elasticities. The price elasticity is −1.6 (Tellis, 1988b). Thus, the results of the empirical analysis show that the average price elasticity is almost 15 times the average advertising elasticity. Because the average can be influenced by outliers, the authors also compared the advertising and price elasticities based on medians. They found the median price elasticity was almost 20 times that of the median advertising elasticity. For durable goods, the median price elasticity is 25 times the median advertising elasticity, whereas this ratio is just 5 for nondurable goods.

This result suggests that in the case of nondurable goods, price discounting could be more profitable than an advertising increase. The actual profitability would depend on margins, pass-through of promotions, and consumer switching. Based on estimated levels of pass-through and of consumers switching brands for a better deal, the authors make a rough estimate of the optimality of the advertising in durables and non-durables. They suspect that marketers of non-durables are probably over-advertising while those of durables are probably under advertising.

Another important finding is that the advertising elasticity is almost half as high in the US as it is for Europe. The reason may be that advertisers in the US tend to over-advertise or that those in Europe are not advertising as much as they should. In terms of the ratio of the median price elasticity to advertising elasticity, the ratio is three times higher for the US (19.5 versus 6.2). This difference may suggest consumers are much more price sensitive than advertising sensitive in the US relative to Europe. One reason, again, may be that the level of advertising is too high in the US. Another reason may be that there is less scope and correspondingly less sensitivity for price discounting in Europe than in the US.

The authors also report that products in the early stages of their life cycle have a median ratio of price to advertising elasticity of 17.7 whereas those in the later stages have a significantly higher median ratio of 22.2. This result indicates that price discounts would be more effective in promoting sales in the later stages of the product's life cycle whereas in the early stages advertising would be more effective in promoting sales in the early stages of the product's life cycle.

Studies of ad frequency

Explanation of terms and studies

Advertising normally works through its effects on individual consumers. Thus the advertising budget in a time period ultimately translates into a sequence of individual exposures targeted to one or more consumers. Similarly, sales may be considered an aggregate of consumers' choices about individual brands. The term, frequency, refers to the number of ad exposures each consumer receives in a particular time period. Effective frequency refers to the optimum frequency that maximizes the outcome designed by the advertisers, such as sales, profits, or price level.

Databases that record consumers' choices of brands, sometimes record the delivery of advertising in the form of advertising exposures. The analysis of consumers' choices presents unique problems and opportunities for understanding the effects of advertising. The major problem is that, since each consumer has a large number of purchases, the size and complexity of the data base quickly increases with the sample size. However, a focus on choice provides a large number of advantages. The key advantages are greater insight into how advertising works and a freedom from bias that occurs if one aggregates data over consumers or exposures.
Like studies on advertising elasticity, studies on frequency also determine the effectiveness of advertising in terms of the shape of the response function. However, studies on advertising elasticity capture the response function of aggregate sales to aggregate advertising expenditure. In contrast, studies on advertising frequency capture the response function of disaggregate consumers’ choices to disaggregate advertising exposures. Thus such studies are far more specific in details and insight. At the same time, they are not immediately practical. Even if a manager knows the effective frequency, he or she still needs to know what advertising budget and scheduling will deliver that frequency to the appropriate consumers. So this stream of research by itself is insufficient to understanding how to use advertising.

**Review of studies**

We review the findings from five of these studies of the effect of ad exposures on consumer choice.

McDonald (1971) analysed the diary records of a sample of 266 panelists in nine product categories for 13 weeks. He took great care to avoid spurious causality when analysing the data. In particular, he made sure that he did not interpret the pattern of loyal consumers of a brand being targeted with more ads, as one of response to advertising. First, McDonald (1971) found that panelists were 5% more likely to switch to than from a brand, when, in the interval between two purchases, they had seen two or more ads for the brand. Second, the above effect was stronger for ads seen less than four days before the purchase than for ads seen more than four days before the purchase. Third, subjecting panelists to three or more exposures did not seem to have a stronger effect than doing so with two exposures.

Pedrick and Zufryden (1991) studied the effectiveness of advertising in the yogurt category using single source data. Three of the results that Pedrick and Zufryden (1991) obtained are similar to those of Tellis (1988): the effects of advertising are relatively small, the effects of promotions are much stronger than those of advertising, and the response to ad exposure is non-linear. The most important result they obtained is that market share increases were much more responsive to increases in reach than to increases in frequency.

Deighton and Neslin (1994) carried out analysis of single source data using econometric models similar to the two prior studies described in this sub-section. The authors studied the effect of exposure frequency on brand choice of the advertised brand. As in the prior two studies, the authors found that the effects of other promotional variables were much stronger than that of advertising. The effect of advertising was significantly different from 0 for two of the three categories. The authors' most important finding was that probability of a consumer buying a brand increased steadily with the number of exposures, even going up to exposure levels of 20. However, this effect went up at a declining rate. Also, the biggest increase occurred when going from an exposure level of 0 to 1.

Jones (1995) analysed single source data for 142 brands in 12 categories for 1991. All 12 were from packaged grocery products and included markets that were competitive and heavily advertised. He focused on the short-term effect of advertising that occurred in the 7 days just prior to purchase. Jones (1995) found that advertising does have short-term effects on household purchases of the advertised brands. However, the direction of the effect is not universal. About 50% of the brands have ad effects that are moderate to strong. About 30% have effects that are not clearly distinguishable, while 20% strangely have negative effects. Some fraction of the brands that have a short-term effect, also have long-term effects on sales. But long-term effects are much less pronounced than the short-term effects. The most important result from the Jones’ (1995) study is about advertising repetition. He found that in the 7 days just prior to purchase, the first exposure gets the most response. Additional exposures do not add much. Thus the conclusion from this study is that “one exposure is enough.”

A marketing consultant, Gibson (1996) found similar results from analysing TRI-NET market experiments of 60 commercials at General Mills. He found that just one exposure of an ad was adequate to achieve big changes in attitude and coupon usage for that brand; multiple exposures were not necessary.

This last result, stated as above, has created some controversy and has led some researchers to question Jones’ (1995) analysis and interpretation. Two issues that are most pertinent are the formation of the baseline sample and the identification of the 7-day period. First, the results of the study are only valid if advertisers do not target households, who buy their brands with heavier advertising. If that’s the case, then Jones (1995) might pick up an effect of advertising that is merely due to targeting. McDonald (1971) took great pains to ensure that his analysis is free from such a spurious correlation. Second, Jones’ (1995) analysis excludes households that may have received ads earlier than the 7-day period. Thus any increase in response from those unmeasured exposures remains unaccounted.
In conclusion, Jones (1995) obtained some very important results. However, the validity and generalizability of the findings must await replication that is assuredly free of the above two problems.

PART B: ADVERTISING’S DYNAMIC EFFECTS IN MARKETS

Besides intensity, market studies on advertising effectiveness have focused on three dynamic aspects of advertising, carryover effects, wearin, and wearout. This section reviews studies on each of these three topics.

Studies about advertising carryover

Explanation of terms and studies

The analysis of advertising carryover is important for several reasons. First, the total effect of advertising depends on the instantaneous effect plus any carryover. If the carryover is substantial, then ignoring this component can grossly underestimate the true effect of advertising. Second, if a pulse of advertising has some carryover effect, it may suggest that the next pulse need not be scheduled until the effect of the first pulse decays. Third, the duration of the effects of advertising may have implications for whether firms should treat advertising as an expense or an investment and whether the government should allow it to be tax-deductible or not.

A large number of primary econometric studies have attempted to estimate the size and duration of the carryover effect of advertising. We have two meta-analyses of these primary studies. This section summarizes what we have learned about advertising carryover from the two meta-analyses and from four important primary studies after these meta-analyses.

Review of studies

Clarke (1976) carried out a meta-analysis of the carryover effect of advertising on sales or market share. Clarke (1976) surveyed the results of 28 studies that analysed the effects of advertising on sales or market share. From those, he found 69 estimates of the carryover effects of advertising. He found that these estimates gave widely different estimates of how long it took for most (90%) of advertising’s effects to last or dissipate. Estimates varied from a low of 0.8 of a month to a high of 1368 months, or 113 years! On closer analysis, he found that a key factor, that affected the estimates of the duration of advertising carryover, was the level of data aggregation. Now this term refers to the level at which data on sales and advertising is collected and analysed. In the sample of original studies Clarke (1976) surveyed, this aggregation could be in weeks, months, quarters, or years. His major finding was that the higher the data aggregation, the longer the estimated duration of advertising’s carryover. So which data interval is the right one?

Clarke (1976) assumed that the appropriate data interval was the purchase frequency – the average frequency with which consumers purchase the product being studied. Based on that, he estimated that the duration of the effects of advertising on sales for the sample of categories he surveyed was between 3 and 15 months. Clarke’s (1976) major assumption – the appropriate data interval is the purchase frequency – is probably not warranted. Tellis and Franses (2006) argue that the appropriate data interval is the unit – exposure time – the largest period in which advertising exposure occurs at most only once and then at the same time every period. This interval is probably in days, hours, or minutes. Thus, the duration of advertising’s effects would probably be much shorter than that estimated by Clarke (1976).

Leone (1995) computed the duration of the carryover effect from past studies. In particular, he used as input the 114 estimates of the carryover effect of advertising collected by Assmus et al. (reviewed above). To compute the duration of the carryover effect, Leone (1995) used the principle established by Clarke (1976). Leone (1995) found that the average carryover effect of advertising was 0.69. Based on this figure, he found that 90% of the effect of advertising would last 6 months. This time period is a little shorter than that determined by Clarke (1976) but also based on an erroneous assumption about the true data interval.

Tellis et al. (2000) tried to answer this question, with a model of advertising response at a highly disaggregate level of hours in the day when advertising occurred. They used a distributed lag model such as that described in Chapter 4.3. A key feature of the model is that it captured the effects of individual ads, channels, and times of the day. Data for the empirical testing was gathered for five markets in the US. In contrast to most past studies, the authors found that the carryover effect of advertising was fairly short. Over the five markets studied, the average carryover effect was 8 hours. While this number might seem unreasonably long, consider that consumers receive hundreds of messages a day. The new messages could well erase the effect of the old messages. Another important result of the study was the advertising carryover varied across cities and across times of the day. For example, there is a slight delay in the response to advertising, especially in the mornings when consumers are very busy. This variation over time of the day and cities suggests that managers need to carryover out their analyses by specific markets and time periods.

Mela et al. (1997) examined the “long-term” effects of promotion and advertising on consumer’s brand choice. This study is probably one that focused on the longest time horizon – 8¼ years. As such, the title of “long-term” is probably justified. The authors analysed single source data in one product category – a frequently purchased non-food packaged product. During the time period of the study, the authors found that advertising had declined while promotions had increased. The author’s most important finding was that advertising reduces consumers’ price sensitivity while promotion increases consumers’ price and promotion sensitivity. They found that these
effects were significantly larger for a price-sensitive segment than for a loyal segment. Subsequent analysis of profitability on the same data set indicated that advertising could be more profitable than promotions or price discounting (Jedidi et al., 1999).

Lodish et al. (1995) found that in general, the effects of advertising did not die out immediately after a campaign stopped. When advertising was effective, 76% of the initial increase persisted for a year later, after the campaign ended, and another 28% persisting for a third year. So the total carryover effect could equal the current effect (computed in the first year). In these cases, there was also a small (about 6%) carryover effect in category volume. Advertising effectiveness was also more persistent over time for new products than for mature products. Note, that the findings of this study seem to conflict sharply with those of Clarke (1976) who found that advertising carryover is from 3 to 9 months, and those of Tellis et al. (2000) who found that advertising carryover last only about 8 hours. One solution to this conflict comes from considering the time frame. Lodish's (1995) finding about advertising carryover is different from that computed in all prior studies reviewed above. The prior studies try to estimate the average carryover effects of advertising in separate time periods or separate ads while the campaign is progressing. In contrast, Lodish and his associates (1995) estimated the carryover effect of an entire campaign after it ends. Thus, even though many authors have tried to compare the two types of findings and draw generalization, no simple comparison is valid. The two sets of findings must be treated as complementary findings about the carryover effects of advertising.

Dekimpe and Hanssens (1995) sought to determine the long-term or persistent impact of advertising. They tested their model on monthly sales of a chain of home improvement stores from 1980 to 1986. The authors found that sales and total advertising spending have a long-run or evolving component, for two reasons: (1) repeat purchases from those who bought due to advertising and (2) purchases from those who heard about the product from those who saw the advertising. They argued that these higher sales feed back into higher advertising as managers set ad budgets based on sales figures. They suspected that the evolving pattern they found is due to such a chain reaction. The authors’ most important and ambitious claim was that while some of the effect of advertising dissipates in the short term, some of it lasts or persists, even when the advertising is stopped. They estimated that an extra dollar in advertising updates the long run sales forecast by $1.09 and the long run advertising forecast by $0.49. On the other hand, the authors found that even though advertising has a positive persistent effect, it does not have a positive persistent profit impact.

**Studies about wearin and wearout**

### Explanation of terms and studies

Wearin and wearout are phenomena that refer to ad campaigns. Strictly speaking, a **campaign** is a series of ad exposures during a particular time period. The campaign could use just one ad or a series of differing ads so long as they have a common theme. A good recent example is the various executions of the Master Card “There are some things money can't buy …” campaign, which ran successfully for over 5 years.

**Wearin** is the increasing response to an ad with increasing repetition of exposures of the ad (see Table 4.4.1). This effect typically happens in the early stages of a campaign. In contrast, **wearout** refers to the decreasing response to an ad with increasing repetition of exposures of the ad. This effect typically occurs in the latter part of a campaign (see Figure 4.4.1). Thus, by their very definition, the phenomena of wearin and wearout typically refer to the effectiveness of an ad campaign. Two reviews of the literature and three studies address the wearin and wearout of ad campaigns.

### Review of studies

Greenberg and Sutton carried out an early, important review of published studies on wearout. Most of their review focused on market studies, or quasi-market studies. Their review suggested the following major conclusions. All ad campaigns ultimately wearout. More effective campaigns might take longer to wearout than those that are less effective. A creative may wearout more slowly for product categories where purchase occurs infrequently than for those where it occurs frequently. Wearout occurs more slowly for campaigns in which exposures are spaced apart than for those in which they are positioned together. If a worn out creative is reintroduced after a break, it might be effective once more. However, it will wearout even faster a second time around. Wearout of an ad campaign occurs faster among heavy TV viewers than among light TV viewers, assuming that the heavy TV viewers see the campaign more often than the light viewers. A creative, which is simple or unambiguous, wears out faster than one that is more complex or ambiguous. At the extreme, a creative that involves only a single punch line or point of humor wears out relatively fast. The use of a variety of creative executions in an ad campaign can delay wearout. Wearout is further delayed, the more these individual executions differ from each other. In contrast, campaigns with just a single creative wearout relatively fast.

Pechmann and Stewart (1992), Sawyer (1981), and Sawyer and Ward (1976) carefully reviewed all studies that included wearin and wearout. None of their conclusions contradict those of Greenberg and Sutton. However, some of their conclusions complement those of the previous review, especially on wearout. Here are their main conclusions. Wearin does not exist or occurs quite rapidly. Wearin may take a little longer in the field than it does in the laboratory. The reason is that in the field all consumers may not see an ad every time it is released. In addition, even if they were to see the ad, consumers' exposure in the field tends to be voluntary, while that in the laboratory tends to be forced. Wearin may also occur more slowly when ads are scheduled apart rather than when they are scheduled together. Ads that use emotional appeals wearout more slowly than those that use arguments. Wearin and wearout occur faster for consumers who are highly motivated and
actively process the message in the ads, than for those consumers who are not so motivated and active.

Tellis et al. (2000) examined the wearing and wearout of the creative. The advertiser in that study retained all its old creative executions, which it used in old and new markets. Thus the authors had access to a bank of over 60 creative executions, which were aired over a variety of cities, time periods, and durations. Indeed, this study is probably the largest field study that rigorously examined the wearing and wearout of ads. Here are the main conclusions. Behavioural response of a creative declined steadily with use. The strongest response occurred in the first week in which the creative was aired. That is, wearing is immediate. Wearout occurred from the second week of use of a creative. That is, wearout starts quite early in the life of a creative. Wearout is steepest in the first few weeks of the airing of a creative. Thus, consistent with the results of Jones and others, ads did not seem to have much of a wearing. On the contrary, they began to wearout pretty soon after being used, and the wearout was fairly rapid early on in its use.

Blair (2000) analysed the effects of 20 split-cable copy tests for wearing and wearout. She measured response in terms of awareness and trial. She is one of the few authors to report substantial wearing. Her major findings are the following. Ads show both wearing and wearout. Ads with higher persuasion scores show stronger wearing with increasing delivery of GRPs in the market than those with lower persuasion scores. Totally ineffective ads show neither wearing nor wearout.

Some other studies find other complementary results about wearing and wearout. An article reports on 168 studies involving 58 product categories and 111 brands in 5 countries of North America and Europe (Masterson, 1999). The results suggest that wearout does occur internationally, as in the Blair (2000) study above. A recent study about attention (Pieters et al., 1999) suggests no wearing and immediate wearout as in the Tellis et al. (2000) study above. The study found that attention to an ad decreased almost 50% from the first to the third repetition, in both natural and artificial conditions. The immediate decline in attention with repetition may be one reason for early wearout of a creative.

PART C: MARKET EFFECTS OF ADVERTISING CONTENT

Explanation of terms and studies

There are a vast number of market studies on advertising effectiveness. Almost all of these studies have focused on either on advertising weight, elasticity, or frequency. Only two of these studies have considered the role of individual ads and especially the content or creative of these ads. In contrast, a vast literature in consumer behaviour has addressed how the content of an ad must be configured to make the ad effective. However, most of these studies have been laboratory experiments conducted in highly artificial environments (Tellis, 2004; Vakratsas and Ambler, 1999). An emerging effort in market studies is to integrate these two streams of research by determining the effect of the content of ads on sales in real markets. There are only two major studies in this stream of research.

Review of studies

Chandy et al. (2001) sought to determine the effectiveness of various ad appeals in real market situations. Their study was an extension of the one reported above for the referral service. The service started initially in only one city (market). Over a decade, it gradually expanded to cover over 23 markets. Thus, the markets varied in age from a few months to over 10 years. During that time, the service developed a set of 72 ads that it used with varying frequency and intensity over the various cities.

One important finding was that the effects of advertising on sales and profits varied substantially over markets, TV channels, and especially creative. Many creative executions were not effective in increasing sales while most were not profitable. A valuable part of the analysis was its specific findings about creative executions, media, and time slots that worked. The analysis pinpointed which creative executions the advertiser should pursue and those it should drop, the channels it should use and those it should drop, and the time slots in which media buys would be most productive.

The ads themselves used a variety of appeals. The authors measured these appeals on a rich set of behavioural variables. In particular, they assessed to what extent the ads used argument, emotion, or endorsement, how the message was framed, and how long the key message was on. With these measures, the authors were able to assess the effectiveness of various ad appeals depending on whether they were used in new versus old markets. A general finding was that advertising response was stronger in younger markets. The results of the study indicate that argument-based appeals, expert sources, and negatively framed messages are particularly effective in new markets. Emotion-based appeals and positively framed messages are more effective in old markets.

MacInnis et al. (2002) report on a set of multistage experiments conducted in the 1990s. The authors developed a database of TV commercials that had been used in advertising weight tests for frequently purchased products. The database contained 47 ads, each tested in a different market experiment. Twenty-five of these ads produced statistically significant increases in sales, while 22 did not do so. The authors then recruited and trained a set of 22 paid judges to evaluate these ads on a scale of emotional to rational appeals. The results showed that emotional ads were significantly more likely to have produced increases in sales in the weight tests. On the other hand, ads that used heuristic-based or rational appeals were more likely to have not produced increases in sales in the weight tests. In a further experiment, the authors pursued whether these ads affected subjects in...
laboratory conditions. They found that ads that produced positive feeling and limited negative feelings were more likely to have produced increases in sales in the weight tests.

The message from these set of experiments, is that in frequently purchased mature product categories, emotional ads that create positive feelings and limit negative feelings can benefit from increased advertising.

**SUMMARY**

This section summarizes the findings about the markets effects of advertising.

*Findings about advertising weight*

The review of weight studies lead to the following common findings:

- Weight alone is not critical. Increases in weight alone do not necessarily lead to an increase in sales. Decreases in weight alone do not lead to sales decline, at least in the short to medium term.
- Prolonged cessation of advertising shows deleterious effects in some tests but no negative effects in other tests. These results reiterate the importance for determining if firms are over-advertising in the short term.
- If advertising has any effect, that effect is visible early on. If it has no effect early on, then it is unlikely to have an effect with further repetition.
- Changes in media, copy, product, segments, or scheduling are much more likely to leadto changes in sales than do changes in weight.

*Findings about advertising elasticity*

The review of elasticity studies leads to the following major substantive findings:

- The grand mean of the advertising elasticity is 0.1. In comparison price elasticity is at least sixteen times higher in magnitude but opposite in direction.
- Advertising elasticity is higher in the early stages of the product life cycle than in the latter stages.
- Food products have an elasticity that is 0.1 higher than other products.
- Elasticities in the US are almost half those in Europe.
- The ratio of the median price to advertising elasticity for non-durables is five times that for durables.
- Short-term elasticities are much lower in models that incorporated a carryover coefficient (a lagged dependent variable) than in models without one.
- Models that contained exogenous variables had smaller short-term elasticities than those that did not.
- Elasticities in additive models were higher than those in multiplicative models.
- Pooled data involving cross-sectional observations in addition to time series observations, yielded higher elasticities.
- Elasticities did not differ by the measure of the dependent variable in the original study, whether sales or market share.
- Elasticities did not differ by the subject of the original study, whether product or brand.
- Elasticities also did not differ by type of estimation in the original studies.

*Findings about advertising frequency*

The studies on frequency suggest some convergence on the following main findings:

- The effects of ad exposure on choice are much less prominent than those for price and sales promotions.
- Higher frequency of ad exposures leads to increased probability of purchase.
- Purchase probability exhibits a concave response to higher ad frequency. That is, the probability of purchase increases but at a decreasing rate.
- For mature, frequently purchased products, the optimum level of exposure tends to be relatively small, ranging from 1 to 3 exposures a week.

Some important but unique findings, not replicated across studies, are:

- Brand familiarity or loyalty moderate response to ad exposures. That is, more established brands have a different response to ad exposures than newer brands. In particular, older established brands have an earlier and lower peak response to ad exposures than newer brands.
- Purchase probability may be more responsive to reach than to frequency.

*Findings about advertising carryover*

The following effects of advertising were very general:

- The effects of advertising are non-instantaneous. That is, advertising has some carryover effect.
- Advertising's carryover needs to be modeled very carefully with appropriate data. The estimated duration of advertising's carryover increases with the level of data aggregation. In particular, two contrasting
recent studies how that:
  - In terms of total weight of a one-year ad campaign, advertising carryover may last as long as another two years.
  - In terms of individual ads analysed in very small time periods such as hours, advertising carryover may be quite short, lasting just about 8 hours.

The following effects are important although they have been confirmed by only one study.

- Advertising seems to have an indirect long-term positive brand effect in terms of reducing consumers' price and promotion sensitivity.
- In some situations, advertising shows some hysterisis. That is, it can cause some permanent or persistent increase in sales.
- Within a product category, advertising carryover of the same ad varies somewhat across cities and across times of the day.

**Findings about wearin**

- Wearin either does not exist or occurs quite rapidly.
- Wearin occurs more slowly:
  - When exposures are schedule apart
  - Attention is not forced
  - For emotional appeals relative to arguments
  - For consumers who are not highly motivated or active in processing ad messages
  - In field situations relative to laboratory settings.

Wearin might be stronger with ads that have higher persuasion scores.

**Findings about wearout**

- All ad campaigns ultimately wearout.
- Wearout may occur more slowly:
  - For a creative that is complex, uses an emotional appeal, or is ambiguous
  - For ads that are less effective than those that are more effective
  - For product categories where purchase occurs infrequently than for those where it occurs frequently
  - For campaigns in which exposures are scheduled apart than for those in which they are scheduled together
  - For light viewers of TV than for heavy viewers
  - For campaigns that use a variety of creative executions relative to those that use a single creative.
- If a worn out creative is reintroduced after a break, it might be effective once more. However, it will wearout even faster a second time around.

**Findings about advertising content**

- Changes in the creative, medium, target segment, or product itself sometimes lead to changes in sales, even though increases in the level of advertising by itself does not.

**NOTES**


**Further Readings**

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