
The Adaptive Information Processing Hypothesis: Accounting for the V-Shaped Advertising Response Function

Minhi Hahn, C. Whan Park, and Deborah J. MacInnis

Previous research at Anheuser-Busch reported that the relationship between advertising expenditures and sales can exhibit a V-shaped pattern, with greater sales at both increased and reduced levels of advertising expenditures. While the right-side of the V-effect is consistent with the traditional perspective on the advertising-sales relationship, the left-side is not. Though the existence of the V-effect has considerable implications for advertising efficiency, theory which accounts for its effects or the conditions under which it occurs is limited. This paper critically evaluates previously proposed segment-based explanations for the V-effect and proposes a new (Adaptive Information Processing) hypothesis to account for its effects. The hypothesis suggests interesting implications for advertising decisions.

Minhi Hahn is Associate Professor of Marketing at Korea Advanced Institute of Science and Technology (KAIST).

C. Whan Park is a Distinguished Professor of Marketing at the Katz Graduate School of Business, University of Pittsburgh.

Deborah J. MacInnis is Associate Professor at the College of Business and Public Administration, University of Arizona.

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Introduction

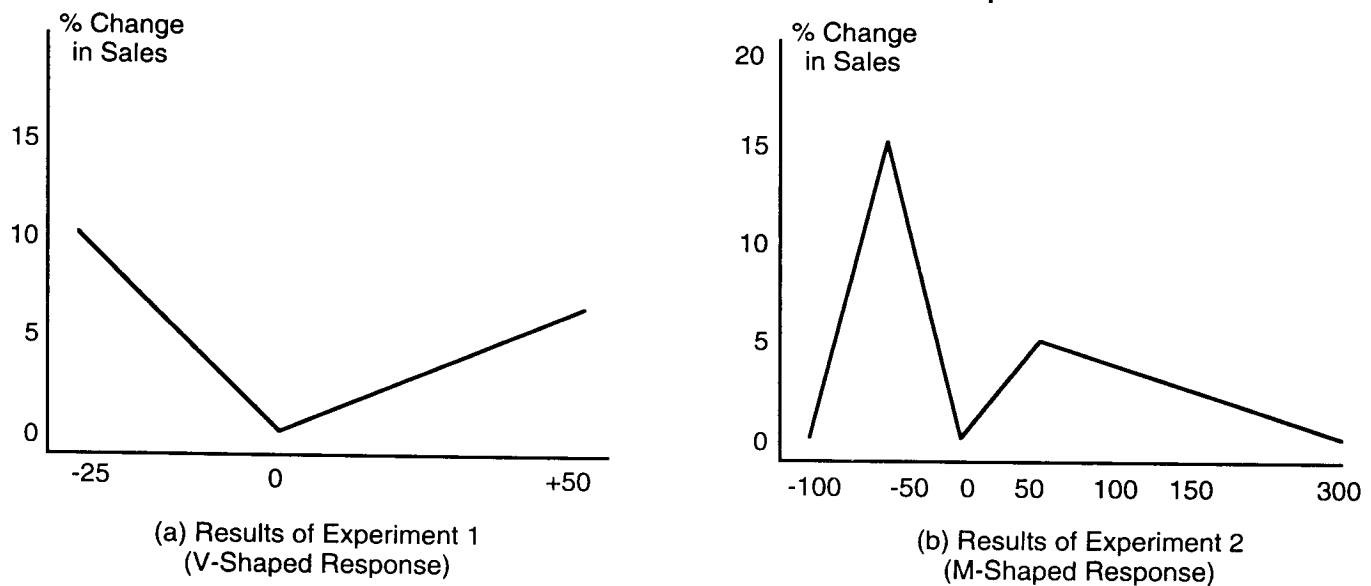
Numerous studies have examined the relationship between advertising expenditures and sales. Some have relied on laboratory experiments with individual subjects responding to advertising of artificial or new products, some on field experiments using geographical market areas as experimental units with advertising of mostly established products, and some on the analysis of historical and/or cross sectional market data for new or established products. Across these varying contexts, studies generally find that the advertising response function is either positive (concave or S-shaped) or V-shaped (Ackoff and Emshoff 1975a; Anand and Sternthal 1990; Assmus, Farley and Lehmann 1984; Little 1979; Simon and Arndt 1980). Furthermore, this finding appears even under varying advertising inputs (size, frequency, expenditure, etc.), repetitions, and schedules.

However, as Little (1979) notes, advertising is rich with phenomena that remain to be discovered and understood. One important issue which has received surprisingly little attention is the effect of lowering advertising expenditures on sales of mature brands. Studies of both individual and aggregate-level advertising response have typically focused on the effects of increasing or maintaining, not lowering, advertising weights. Relatedly, while some research has examined the impact of advertising on consumers' forgetting of new or artificial brands, few have studied advertising's impact on memory for real, mature brands.

Interestingly, however, available evidence regarding reduced advertising expenditures suggests the potential for minimal, not negative, sales impact for mature brands. For example, in a speech at the 1977 Advertising Research Conference, it was noted that only 6 of AdTel's 200 early tests of mature brands were "weight-reduction" tests. None of the 6 showed significant differences in sales a year after the tests had run (Haley 1978). Also, an unpublished but carefully executed American Oil case reported a substantial reduction in advertising after "low-level" tests showed no significant sales impact following advertising budget changes (Haley 1978). In contrast to expectations then, empirical evidence reports no necessary decline in sales from reduced levels of advertising, especially when advertising is reduced from a level maintained for a long period.

Interestingly, some studies even suggest that in certain situations re-

Figure 1
V-Shaped Responses Observed in the Anheuser-Busch Experiments



duced advertising may increase sales. For example, following the broadcast ban of cigarette advertising in 1970, per capita cigarette consumption increased for the subsequent three years. This growth is remarkable because there had been a notable downward trend in per capita cigarette consumption starting from 1967 (Schuster and Powell 1987). The positive effects of lowered advertising budgets have also been observed in carefully controlled experiments at Anheuser-Busch (Ackoff and Emshoff 1975a; Rao 1970) and Campbell's soup (Eastlack and Rao 1989, experiment 17 versus 16). The Ackoff and Emshoff study is especially interesting since it reported a V-shaped advertising response, with greatest sales at both high and low levels of advertising expenditures. To the authors' knowledge, it is also the only study to propose a theoretical explanation for the V-effect.

The objectives of this paper are twofold: First, we introduce the V-shaped advertising response for mature brands and emphasize its theoretical and empirical importance. Second, we critically evaluate the segment-level hypothesis proposed by Ackoff and Emshoff (1975a) and offer an alternative individual-level hypotheses for the V-effect. Implications from the theory are also explored.

The V-Shaped Advertising Response

The existence of the V-shaped advertising response, reported in a controlled field experiment by Ackoff and Emshoff (1975a), showed that either a 25 percent

reduction or a 50 percent increase in advertising from the base level was associated with increased sales (see Figure 1a). A second experiment designed to assess the reliability of the phenomenon varied seven levels of advertising expenditures across matched markets. The results replicated the first experiment, finding a bimodal M-shaped response curve with greatest sales associated with advertising at -50 percent and +50 percent of the current advertising expenditure levels (Figure 1b). Even total elimination of advertising (-100 percent) did not negatively affect sales until more than a year and a half later.

Because the V-effect is too much at variance with common expectations, doubts about its existence have been raised. For example, Allaire (1975) expressed concerns regarding the validity of the effect and experimental evidence Ackoff and Emshoff offered in its support. The fact that the observed relationship between advertising and sales did not reach statistical significance was of particular concern. As noted earlier, however, the V-effect is not at variance with other empirical evidence. In addition, several issues prompt further consideration of the V-effect.

First, the controlled field-experimentation methodology utilized by Ackoff and Emshoff (1975a) and Eastlack and Rao (1989) cannot be overlooked as it offers a powerful basis for determining a cause and effect relationship between advertising expenditures and sales. Specifically, assigning matched markets to different levels of advertising expenditures allows greater confidence that observed changes in sales are

attributed to advertising expenditures as opposed to extraneous confounding factors. Weilbacher (1984, p. 93) notes "unusual admiration in the advertising industry for the design, integrity, and intellectual intensity" that characterized this influential marketing classic (Enis and Cox 1988).

Second, in identifying novel phenomena with potential for critically expanding current knowledge, one may ask whether statistical significance represents the central criterion by which an effect should be judged (Ackoff and Emshoff 1975b). Relatedly, obtaining statistical significance in this study may have been difficult given the relatively small number of experimental units (markets) utilized.

Third, while the increase in sales was not statistically significant, the managerial (practical) significance of the finding may outweigh statistical significance (Dodson 1989) as the increase is remarkable and interesting. Ackoff and Emshoff (1975a) report as much as a 15 percent increase in sales with reduced advertising levels, while Eastlack and Rao (1989) found a 5.1 percent increase in sales when advertising was reduced by 50 percent. Relatedly, Anheuser-Busch increased sales over a six year period from 7.5 to 14.5 million barrels while reducing advertising expenditures from \$1.89 to \$.80 per barrel. Opportunities for increasing sales, if only by 5.1%, cannot be overlooked in practice, particularly if these increases are associated with reduced advertising expenditures. Even an effect of no change in sales given reduced advertising expenditures has important implications for advertising efficiency.

Finally, the V-effect appears consistent with anecdotal evidence regarding the negative impact of frequent exposures on consumer preferences for aesthetic stimuli (e.g., movie stars, popular songs, etc.). Managers in the entertainment industry carefully control exposure of their product so as to enhance its market value (i.e., consumers' preferences). Based on the idea that repetitive exposure to such aesthetic stimuli often reduces brand popularity and consumer preferences (familiarity breeds contempt), they believe that reduced exposures can sometimes enhance consumers' product evaluations.

The above issues prompt greater consideration for the V-effect. Of particular importance is the development of theoretical explanations for effect and the conditions under which it occurs. Once these explanations are developed, further testing, application and theoretical development are possible. Any proposed explanation must, however, explain why: (i) current levels of advertising are less effective than increased levels; (ii) the reduction of advertising from

the current level increases sales; and (iii) the effect is observed in experiments that last up to 12 months.

A segment-based hypothesis (described below) has been proposed to explain the V-effect. However, its assumptions are fairly restrictive. Furthermore, the hypothesis provides little insight into individual level responses to advertising exposures. Next, we present and critically evaluate various segment-level hypotheses. An alternative individual level explanation for the effect is then offered.

Segment-Based Hypotheses

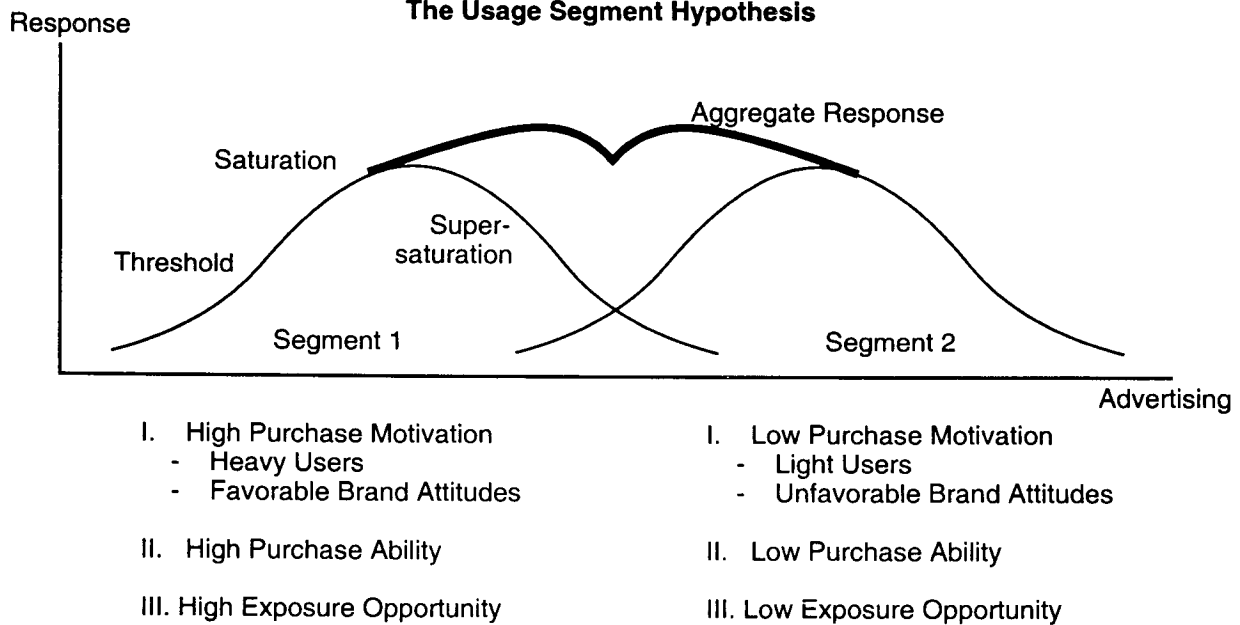
One explanation for the V-effect offered by Ackoff and Emshoff (1975a) is that different consumer segments exist in each market, each with different threshold, saturation and supersaturation points (see Figure 2). The aggregate response curve for the combined segments therefore exhibits a V-shaped pattern; that is the left and right side of the V-effect are due to responses of consumers in different market segments. Note that this explanation ties the existence of the V-effect to aggregate (segment-based) as opposed to individual-level responses to advertising. The segment-based hypothesis is interesting, as there are a number of theoretically distinct segments beyond those offered by Ackoff and Emshoff (1975a) whose aggregate response curves are consistent with the V-effect. Segments based on varying levels of motivation, ability and opportunity are identified below.

Segments Based on Differential Motivation

Segments based on user-status. Ackoff and Emshoff (1975a) identify segments based on user status; that is, light, moderate, and heavy users of the product category. In essence, consumers in each segment differ in their motivation to buy the product on a frequent basis, if at all. As heavy users are in the market more often than light users, fewer exposures may be required to prompt purchase (see Figure 2). More exposures may be necessary to remind light users of the product as they are in the market less frequently. These exposure increases may, however, represent levels of supersaturation for heavy users, causing ad wearout and purchase decline.

Segments based on brand-attitude. The brand attitude segment characterization can also fit the V-effect if consumers with positive brand attitudes require fewer exposures than those with negative attitudes to stimulate purchase. Consumers with positive brand attitudes tend to be more motivated to

Figure 2
The Usage Segment Hypothesis



process information from an ad (Tellis 1988). Enhanced motivation would account not only for the effectiveness of early exposures for such consumers (left-side upward sloping segment in Figure 1b), but also wearout caused by exposures increase (left-side downward sloping segment in Figure 1b). Specifically, consumers who process ad information intensively extract information from the ad during early exposures. Because subsequent exposures do not provide new information, consumers are likely to find them boring (Batra and Ray 1986; Rethans, Swasy and Marks 1986). On the other hand, consumers with negative brand attitudes (those who are generally less motivated to process information from an ad) will require more exposures for an ad to be effective (right-side upward sloping segment in Figure 1a and 1b). For them, enhanced levels of advertising may work by breaking down resistance. Excessive exposures cause boredom for these consumers, too, and result in the right-side downward sloping segment in Figure 1b.

Ability-Based Segments

Segments based on differential purchase ability. Market segments are commonly described by income and other economic variables that should impact consumers' purchase ability. The existence of these purchase-ability based segments may also be consistent with the V-effect. Specifically, few commercial expo-

sure may be necessary to translate an aroused need into purchase for those with considerable discretionary income. Segments characterized by greater financial constraints, however, may require more exposures before needs are aroused to a level where other purchases are forsaken for purchase of the advertised product. Ackoff and Emshoff (1975a) provide some empirical support for the ability based segment hypothesis, finding a positive correlation between average deviations from forecasted sales and average discretionary income in each market.

Opportunity-Based Segments

Differential media exposure. Finally, the differential usage of media by various consumer segments may also be consistent with the V-effect. Segments described as light, moderate, and heavy users of media (Scissors and Surmanek 1986) have different opportunities for ad exposure. As each segment differs in its propensity to view media, the number of exposures necessary to stimulate sales differs. Because heavy users of media have considerable opportunity for ad exposure, fewer exposures are necessary to stimulate sales. Too many exposures for heavy users cause over-exposure and wearout, and consumers may actively counterargue ad content (Belch 1982; Anand and Sternthal 1990), thus explaining the left-side downward sloping curve of the V-effect. As light users are infrequently exposed to media, their opportu-

nities to view an ad are low. For them, increasing exposures positively affects sales by providing greater exposure opportunities to an ad, which in turn produces the right upward sloping portion of the V-effect (Krugman 1972). Too much exposure may, however, cause wearout even for light users. Thus, as indicated in the right-hand downward sloping curve in Figure 1b, even light users of media have points of super-saturation.

Restrictive Assumptions Characterizing Segment-Based Hypotheses

While the above discussion identifies a number of segment-based explanations for the V-effect beyond the usage-segment idea proposed by Ackoff and Emshoff, these explanations are limited by their rather restrictive assumptions.

Segment Homogeneity. Segment-based hypotheses assume that each consumer falls into one distinct segment, with consumers in each segment homogeneous in their response to the level of advertising. The criterion of segment distinctiveness is somewhat restrictive, however. If consumers are not ideally homogeneous, segment boundaries are likely to be diffuse, reducing the demarcation between segments and thus making it unlikely for the V-shaped pattern to emerge in the aggregate response curve.

Small Overlap in Advertising Response Curves. A second assumption of segment-based hypotheses is that the advertising response curves of consumers in the two neighboring segments have a small overlapping portion, if any (see Figure 2). If the overlap in the response curves between segments is large, however, the V-shaped pattern will not emerge in the aggregate response curve.

Limitation as a Theoretical Explanation. Finally, segment-based hypotheses have critical limitations as theoretical explanations for the V-effect. First, they imply that the current level of advertising is always at or very close to the lowest point of the V-shape. Unless advertising expenditures are intentionally set to correspond with the lowest point of the V-shape, the probability that current advertising is at such a level in most of the selected experimental markets is extremely low. Thus, segment-based hypotheses fail to explain two of the three crucial aspects of the V-effect— why positive or negative changes in advertising from the status quo enhance sales.

Second, as previous research assigned matched markets to different levels of advertising, it is un-

clear why matched markets should represent different motivation, ability and/or opportunity-based segments. If observed differences between markets in their responses to different levels of advertising exposure are not due to differences in market composition (i.e., different markets represent different segments), an individual, as opposed to a group level explanation, may account for observed effects. Thus it is useful to consider why an individual will sometimes be more likely to buy the product at reduced levels of advertising, why the same individual will be less likely to buy the product at current levels of advertising, and why the same individual will be more likely to buy the product at increased levels of advertising.

The Adaptive Information Processing Hypothesis

Multiple segment hypotheses are limited in explaining the V-effect, as they explain sales changes based solely on advertising wearout or advertising duration, and are unable to explain why sales are lower at current vs. reduced or increased advertising levels. Furthermore, they utilize a market level explanation for the V-effect that appears unlikely. The alternative individual level account for the V-effect offered below assumes the V-effect is due to different modes of (1) ad processing (automatic vs. deliberate) and (2) ad retrieval (ad-initiated vs. self-initiated).

The Right-Side of the V-Effect

The right upward sloping side of the V-effect is consistent with the traditional perspective on the advertising/sales relationship which posits that consumers pay attention to ad content when they are interested or involved in the ad, brand, or product category (Mitchell 1981; Petty and Cacioppo 1986). As the number of ad exposures increases, consumers have more opportunity to process ad contents, and consequently come to learn more about the brand and its relationship to competitive offerings (Batra and Ray 1986; Krugman 1972; Obermiller 1985). Repetition can further enhance sales by allowing consumers to extract novel content from the ad (Rethans, Swasy and Marks 1986), and making consumers' attitudes about the brand highly accessible (retrievable) from memory (Berger and Mitchell 1989). With continuous exposures, ad processing becomes more automatic, with consumers less likely to process ad contents in any great detail. Nevertheless, continuous exposures may still enhance sales by strengthening the associa-

tion between the brand and its usage benefits in memory. Specifically, repetition at this stage may influence sales more through its impact on memory than on affect. It cues the brand name from memory (memory cueing effects), making it more likely that the brand name will be retrieved in the purchase context (Zielski 1959; Keller 1987). This is referred to as ad-initiated retrieval. Thus, unless advertising is increased to the supersaturation level, we normally expect that advertising above the current level will positively affect sales.

Still further increases in ad expenditures may, however, be associated with lower sales as consumers' irritation with the ad grows and their propensities to expose themselves to and process the ad decrease. Indeed, this level of exposure may cause consumers to process ad information critically, counterargue ad claims, and/or question the advertiser's motives (Belch 1982; Calder and Sternthal 1980; Cohen and Areni 1991). A number of studies have documented this wearout effect (Appel 1971; Batra and Ray 1986; Calder and Sternthal 1980). Or following Berlyne's (1970) two-factor model of repetition, an increase in the number of exposures reduces positive habituation and increases tedium, which, in turn, causes boredom and inattention. In fact, Gelb and Zinkhan (1985, 1986) found empirical support for this form of advertising wearout effect. At this supersaturation level, the brand, thus, becomes more vulnerable to competing brands and their ad strategies. Brand switching due to boredom or sales promotions of competing brands is more likely at this stage than before.

The Left-Side of the V-effect

Unlike the right side, the left side of the V-effect is consistent with neither the traditional information processing perspective, the advertising wearout literature, nor the traditional advertising-sales response function. According to our adaptive information processing hypothesis, sales increase given reductions in advertising from the current level because they (1) encourage deliberate processing of ad information, (2) foster cueing of favorable brand information from memory, and (3) enhance self-persuasion.

The left side of the V-effect is hypothesized to occur when the baseline level of advertising involves impact ads—i.e., those high in interest value and persuasion. Specifically, initial (baseline-level) advertising with an ad high in interest value and persuasion should encourage deliberate processing of ad information among consumers, and should create strong

traces in memory for the brand, the ad, and the advertised information. This should, in turn, enhance consumers' retrieval of the brand and its advertised attributes. However, processing of ad information and retrieval of favorable associations with the brand may be more facilitated when advertising for the brand is reduced from the baseline level. This is so for several reasons.

First, because an ad which has not been seen in the recent past retains its novelty by virtue of its absence, interest in and processing of the ad should be enhanced by fewer advertising exposures. Consumers in this case become more attentive to the ad upon subsequent exposures and engage in in-depth processing of ad information, further strengthening memory traces regarding the brand and its positive attributes/benefits.

Second, a high impact ad should strengthen brand name salience and favorable brand associations and memory traces by stimulating positive word of mouth communication about the ad. Note that such word of mouth communication is unlikely as exposures increase, for example, to a baseline level because the ad's novelty impact declines. With reduced exposures positive word of mouth communication may, however, occur.

Third, given that information regarding brands in a product category are often associated with the product category, and hence linked in memory, activation of one may serve to activate the other through spreading activation processes (Anderson 1983; Collins and Loftus 1975; Negundadi 1990). As such, the retrieval of ad and brand related thoughts may also occur when commercials of competing brands or other external factors (i.e., point of purchase displays) cue brand and ad associations from memory. Such competitor-related cueing may be more likely when exposures are reduced because, as noted above, with reduced exposures the ad becomes novel and salient in consumers' memory.

Fourth, since the ad initially created strong memory traces by virtue of its interest value and distinctiveness, its salience and self-cueing potential should be high (Moscovich and Criak 1976; Eysenck 1984). This self-cueing potential would be diminished with increased exposures because increased exposures lower the interest value and distinctiveness of the ad.

Note that each of these cueing mechanisms (ad-cueing, word of mouth, competitor cueing, self-cueing) may reactivate perceptual or experience-based representations of the ad and brand in memory (Johnson and Raye 1981). The reactivation of the

former may be particularly important for brand switchers and other brand loyals for whom perceptual brand cues may be an important purchase cue. Re-activation of experience-based representations may be particularly important in stimulating purchase/usage among brand loyals since evoking past benefits of the product may stimulate thoughts about further usage. Note further that the various cueing mechanisms are self-reinforcing. For example, while transmission of brand information through word of mouth communication should enhance brand salience, brand salience should itself foster word of mouth communication, which enhances salience further.

Finally, the strengthening and reactivation of memory-based representations which enhance the brand's salience stimulate consumers to think more about the brand. By retrieving and elaborating on these favorable brand thoughts, consumers in essence adopt a self-persuasion strategy. Persuasion stimulated by one's own thoughts is often regarded as more impactful than persuasion stimulated by an ad (Petty and Cacioppo 1983). Furthermore, brand attitudes based on self-generated thoughts are more accessible in memory (Kardes 1988). Even in the absence of brand advertising then, consumers may retrieve and process ad and brand information more often and/or with greater intensity—fostering brand memory and creating more favorable brand attitudes. This is referred to as self-initiated retrieval and processing.

When Does The V-Effect Occur?

As noted earlier, the V-effect is expected to occur primarily for mature brands. This is because (1) anecdotes and experimental evidence for the effect have only occurred in the case of established brands, and (2) for mature brands consumers have generally developed a sufficiently rich concept for the brand such that associations in memory are strongly established and hence salient. Even for mature brands advertising reduction does not always enhance sales. Accordingly, it is important to identify conditions necessary for the occurrence of the V-effect. The adaptive information processing hypothesis posits that the V-effect can be observed: (1) when advertising reduction enhances adaptive information processing; and (2) when advertising increases do not lead to advertising wearout. While also acknowledging other possible conditions, we identify below three major qualifying conditions for the V-effect.

Advertising Effectiveness and Brand Involvement. The V-effect requires two features of advertising—

features that are potentially under managerial control. First, as noted above, the ad needs to be sufficiently interesting or involving to motivate consumers to process its contents. Many factors can foster involvement in an ad (see MacInnis, Moorman and Jaworski 1991 for a review). Among these include emotion, personal relevance, interesting executional content, etc. Furthermore, as noted above, involvement is not by itself sufficient to make an ad effective. Instead the ad must also be persuasive, providing strong message arguments which affect beliefs about the product, allowing the consumer to vicariously experience product benefits, and/or allowing consumers to reactivate critical associations central to the brand's image (e.g., McDonald's provides fun for families; see MacInnis and Jaworski 1989). It is also important that any involvement component of an ad be related to the advertised message or it may distract from the ad's persuasive value (Park and Young 1986; MacInnis and Park 1991).

Note that ads that lack either involvement or persuasion will not create the V-effect. An uninteresting and/or nonpersuasive ad could potentially lead to sales increases when the level of advertising is high, via such processes as classical conditioning or mere exposure. However, an ad that lacks interest will be neither remembered nor reactivated in memory when exposures decline. Nor will reactivation of an unpersuasive ad foster self-persuasion processes.

Exposure Frequency of Baseline. While the above are regarded as necessary, controllable features for the V-effect, another qualifying condition for the effect concerns the baseline level of advertising. Specifically, the V-effect will not be observed when the current (baseline) level of advertising is either too high or too low. When current advertising is at a level where consumers are already at or close to supersaturation, processing may already be automatic and further increases may only foster boredom. Thus sales may not increase with further ad expenditures. The level of exposure associated with supersaturation may, however, depend on many factors, including the quality of the advertising, product level involvement, competitors' strategies, and media scheduling. If advertising expenditures during the baseline period are too small with exposures too limited, there will be no increase in sales when ad expenditures decrease. Advertising during the baseline period should reach a level sufficiently high to foster strong memory traces. Only then will reductions in advertising stimulate deliberate information processing and/or self-initiated ad retrieval. Since the exposure level associated with

supersaturation and/or the level required to register strong memory traces depends on many factors, including the quality of advertising, it is imperative for advertising managers to monitor and trace consumers' reactions to the ad over time. Otherwise, it may be difficult to identify the baseline level of advertising that allows managers to take advantage of the V-effect.

Product Category Characteristics. Several product related characteristics may also foster the likelihood of observing the V-effect. First, the frequency of product purchase should be sufficiently high for the effects of varying levels of advertising exposure to operate on brand purchase. This condition is particularly important to account for the left-hand side of the V-effect. For example, wide availability of the brand and the frequent need for the product may facilitate self-cueing and self-persuasion when advertising levels are reduced.

Second, the V-effect may be more likely with sales of brands in mature as opposed to new product categories. Past research suggests that while new and experienced category users may both respond positively to advertising increases, they differ in their rate of decay following reductions in ad spending. New users typically show fast decay when advertising returns to normal levels. However, decay is slow for "normal" consumers since they do not easily change their behavior in response to reduced levels of advertising (Vidale and Wolfe 1957; Little 1979). It is interesting to note that, according to the Anheuser-Busch study, it took more than a year and a half before sales decay following total reduction of advertising was observed.

Discussion

Because enhancing or even maintaining sales at reduced levels of advertising is critical for efficient and effective advertising, the V-effect pattern deserves greater attention. Segment-based hypotheses proposed by past research do not seem to account for the existence of the V-effect. It is proposed here that under certain conditions substantial reduction from previous periods of advertising can reverse automatic and ad-initiated processing and retrieval modes and generate deliberate and self-initiated modes. Such ad processing modes may, in turn, enhance sales.

The adaptive information processing hypothesis has several interesting implications. One concerns the complete elimination of advertising. Because consumers' attitudes toward a familiar brand are not

something that can be changed in a short period, eliminating advertising need not negatively affect short-term sales. The more impact the ad has, and the greater consumers' involvement with the ad and brand is, the longer sales will be maintained without advertising. Any sales decreases will be observed gradually rather than abruptly for the same reason. This prediction is supported by the Anheuser-Busch study. The effect of complete deprivation of advertising is also represented in the bimodal M-shaped response observed in the second Anheuser-Busch experiment where a 100% reduction in advertising neither increased nor decreased sales.

While the V-effect is based on the reduction of ad expenditures from the previous level for mature brands, the same sales-facilitating effects may occur from the onset of the campaign by carefully controlling exposure frequency of a high impact ad *for a new brand*. Assuming exposure has been sufficient to achieve a threshold level of awareness, careful control over subsequent exposures may enhance ad effectiveness. Infrequent exposure to a high impact ad such as a highly emotional ad, or an ad with memorable humor, heightens or maintains the relative novelty of the ad, encouraging greater attention to and processing of message contents. The high impact ad may also prompt consumers to relate ad information to episodic memories, and thus create self-persuasion (Petty and Cacioppo 1983). Brand attitudes thus become stronger and more salient. Finally, positive word-of-mouth communication not only enhances brand name salience, it also facilitates the development of favorable brand attitudes.

Although ads with strong impact may generate considerable cost-efficiencies and competitively powerful effects when limited in exposure frequency, firms do not appear to take advantage of these benefits. Instead, to maximize short-term benefits, firms tend to increase rather than carefully control exposure levels. The level of exposure needed to secure these short-term benefits is, however, more likely to be at the level of supersaturation. As such, a high impact ad (which is difficult to create in the first place) loses its potential with unjustifiably heavy exposure frequencies, and becomes one of many low involving commercials which compete for consumers' attention. Its low impact on sales, in turn, requires the introduction of a new ad. Since the task of creating another high impact ad is formidable, however, the likelihood of creating an effective ad is low. To enhance the sales effects of this ineffective commercial, the firm must again increase its exposure, which incurs

costs. This vicious cycle of inefficiency appears to exist in reality more often than one may think.

The critical issue then is how exposure frequency for a high impact ad should be controlled. Consistent with partial reinforcement theory and theories on novelty, a highly effective ad should not be exposed to consumers in any systematic and expected manner, but rather given on an intermittent and irregular basis (Ray 1973). Therefore, *pulsing* with an irregular unexpected pattern may be the most effective way to control exposure frequency. Short bursts of exposure will ensure that consumers see the ad, and hence that relevant memories, attitudes, and perceptual/experience-based associations are retrieved and made accessible. However, long periods in which the ad is not shown maintain its arousal capabilities.

Controlling exposure frequency to maintain ad effectiveness may cause a problem of reach. Specifically, limiting exposure frequency by pulsing may be justifiable for those consumers previously exposed to the ad, but it lowers exposure opportunities for other consumers who were not previously exposed. There is, thus, a built-in conflict between reach and frequency in attempting to maintain long-term ad effectiveness. While this may be true, exposure frequency may still be controlled without great sacrifice of reach. As noted earlier, an ad that elicits powerful emotional responses generates strong word-of-mouth which, in turn, helps remedy potential reach deficiencies. Moreover, by carefully selecting a medium that maximizes reach, the potential reach problem may be minimized without compromising the ad's ability to elicit strong emotional arousal over the longer time horizon.

Finally, there are many issues that need to be empirically tested with regard to the V-effect proposed in this paper. The individual level processing hypothesis proposed for the left-hand side of the V-effect is particularly important for its potential contributions to communication research. This is particularly true because of its contrast from and yet its complementarity to Petty and Cacioppo's (1986) elaborations likelihood model (ELM) of communication effectiveness. While the latter emphasizes the importance of message quality for ad effectiveness, the V-effect explanation offered in this paper emphasizes the moderating role of ad exposure frequency on the relationship between high involvement-inducing ability of the ad (e.g., high attention-getting ad) and ad effectiveness. Future studies should test whether or not such an adaptive information processing phenomenon indeed occurs and then identify which spe-

cific factors are largely responsible for the effect. Moreover, it is important to test the V-effect in the context of the three qualifying conditions identified earlier in the paper. It is also useful to examine how sensitive the V-effect is in response to the type of ad appeal (e.g., emotional vs. informational), ad creative quality, types of products involved, types of peripheral cues (e.g., music, visual scenes, etc.) used in the ad, and possibly types of individuals who differ in the intensity of their emotional needs. Since field tests of these issues have to overcome many obstacles that threaten their internal validity, an experimental approach to addressing these issues may be called for. While manipulating exposure frequency over time in a laboratory setting may raise possible concerns over demand effects, attrition problems, and external validity, these challenges may be more readily addressable than the problems with field tests.

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