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Planning Media Schedules in the Presence of Dynamic Advertising Quality

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Abstract

A key task of advertising media planners is to determine the best media schedule of advertising exposures for a certain budget. Conceptually, the planner could choose to do continuous advertising (i.e., schedule ad exposures evenly over all weeks) or follow a strategy of pulsing (i.e., advertise in some weeks of the year and not at other times). Previous theoretical analyses have shown that continuous advertising is optimal for nearly all situations. However, pulsing schedules are very common in practice. Either the practice of pulsing is inappropriate or extant models have not adequately conceptualized the effects of advertising spending over time.

This paper offers a model that shows pulsing strategies can generate greater total awareness than the continuous advertising when the effectiveness of advertisement (i.e., ad quality) varies over time. Specifically, ad quality declines because of advertising wearout during periods of continuous advertising and it restores, due to forgetting effects, during periods of no advertising. Such dynamics make it worthwhile for advertisers to stop advertising when ad quality becomes very low and wait for ad quality to restore before starting the next "burst" again, as is common in practice.

Based on the extensive behavioral research on advertising repetition and advertising wearout, we extend the classical Nerlove and Arrow (1962) model by incorporating the notions of repetition wearout, copy wearout, and ad quality restoration. *Repetition wearout* is a result of excessive frequency because ad viewers perceive that there is nothing new to be gained from processing the ad, they withdraw their attention, or they become unmotivated to react to advertising information. *Copy wearout* refers to the decline in ad quality due to passage of time independent of the level of frequency. *Ad quality restoration* is the enhancement of ad quality during media hiatus as a consequence of viewers forgetting the details of the advertised messages, thus making ads appear "like new" when reintroduced later.

The proposed model has the property that, when wearout effects are present, a strategy of pulsing is superior to continuous advertising even when the advertising response function is concave. This is illustrated by a numerical example that compares the total awareness generated by a single concentrated pulse of varying duration (blitz schedules) and continuous advertising (the even schedule). This property can be explained by the tension between the pressure to spend the fixed media budget quickly to avoid copy wearout and the opposing pressure to spread out the media spending over time to mitigate repetition wearout.

The proposed model is empirically tested by using brand-level data from two advertising awareness tracking studies that also include the actual spending schedules. The first data set is for a major cereal brand, while the other is for a brand of milk chocolate. Such advertising tracking studies are now a common and popular means for evaluating advertising effectiveness in many markets (e.g., Millward Brown, MarketMind).

In the empirical tests, the model parameters are estimated by using the Kalman filter procedure, which is eminently suited for dynamic models because it attends to the intertemporal dependencies in awareness build-up and decay via the use of conditional densities. The estimated parameters are statistically significant, have the expected signs, and are meaningful from both theoretical and managerial viewpoints. The proposed model fits both the data sets rather well and better than several well-known advertising models, namely, the Vidale-Wolfe, Brandaid, Litmus, and Tracker models, but not decisively better than the Nerlove-Arrow model. However, unlike the Nerlove-Arrow model, the proposed model yields different total awareness for different strategies of spending the same fixed budget, thus allowing media planners to discriminate among several media schedules.

Given the empirical support for the model, the paper presents an implementable approach for utilizing it to evaluate large numbers of alternative media schedules and determine the best set of media schedules for consideration in media planning. This approach is based on an algorithm that combines a genetic algorithm with the Kalman filter procedure. The paper presents the results of applying this approach in the case studies of the cereal and milk chocolate brands. The form of the best advertising spending strategies in each case was a pulsing strategy, and there were many schedules that were an improvement over the media schedule actually used in each campaign.

(*Advertising Strategy*; *Advertising Wearout*; *Aggregate Response Models*; *Pulsing Schedules*; *Kalman Filter Estimation*; *Genetic Algorithm*)