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ABSTRACT

Traditional information processing (or high-involvement) models hold that cognitive change leads to attitude change which leads to behavior change. It has been suggested, however, that in many advertising situations, cognitive change can lead directly to behavior change, and that for many products advertising is a "low involvement" situation. In other words, a person need not like a product before he or she purchases it. A study used path analysis to compare the adequacy or ability of both the high- and the low-involvement models to predict advertising effectiveness for a pizza delivery service among a population of college students. Data were gathered from a random sample of 250 students living in undergraduate dormitories. Variables analyzed were (1) advertising exposure, (2) brand awareness, (3) brand knowledge, (4) attitude toward brand, and (5) brand purchasing behavior. Results indicated that for certain paths--the direct effects of exposure on cognitive and affective change, in particular--both high and low models of involvement provided a fairly good fit to the data. However, when the indirect effects were considered, the low-involvement model apparently provided a much better fit to the data. This was especially apparent when the total effects of product advertising were considered. (FL)

# Testing the Hierarchies of Effects: A Path Analytic Approach

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# Testing the Hierarchies of Effects: A Path Analytic Approach

## ABSTRACT

One of the paradigms in advertising research is often referred to as the hierarchies of effects approach. Users of this approach contend that advertising exposure and cognitive, affective and conative change are all interconnected, depending upon two principal factors: consumer involvement and product differentiation.

In the present study, a path analytic approach is used to determine which hierarchy--low vs. high involvement--provides a better fit to data from a "low-involvement" situation.

The results indicate that for certain paths--in particular, the direct effects of exposure on cognitive and affective change--both models provide a fairly good fit to the data. However, when considering the indirect effects of advertising, the low-involvement model apparently provides a much better fit to the data. This is especially apparent when considering the total effects of advertising on product usage.

It is concluded that a path analytic technique can be used effectively to assess the relationship between cognitive, affective and conative change, even when using cross-sectional survey data. Finally, it is argued that further research is needed to identify not only better measures of "level" of involvement, but also "type" of involvement.

## LITERATURE REVIEW

Traditional information processing models hold that cognitive change leads to attitude change which leads to behavior change. Krugman (1965) suggested that in many advertising situations (e.g., for household goods) cognitive change can lead directly to behavior change. He argued that for many products, advertising is a "low involvement" situation, and as such, attitudinal change need not precede behavior change. In other words, a person need not like the product--a neutral attitude will do--before she/he purchases it. Although, following the purchase she/he may develop an attitude about the product.

This alternative information processing perspective has been looked favorably upon by a number of researchers, including Ray et al. (1973), Flay et al. (1980), Rothschild & Ray (1974) and Kline & Pavlik (1981). Of these Ray has been one of the most prominent, outlining three "hierarchies of effects," each based upon the "level of involvement" concept developed by Krugman.

In the first hierarchy, Ray presents the traditional information processing model. Here, cognitive change leads to attitude change which leads to behavior change. This hierarchy, Ray explains, will hold under conditions of high involvement and when there are clear differences between alternatives. Ray calls this the learning hierarchy.

The second hierarchy also holds under conditions of high involvement. However, here the differences between alternatives are almost indistinguishable. Referred to as the "dissonance-attribution" hierarchy, this sequence is the exact reverse of the learning hierarchy. Ray explains that in the dissonance-

attribution hierarchy behavior change leads to attitude change which eventually leads to cognitive change (i.e., learning). The final hierarchy is identical to Krugman's low-involvement learning model. Here, cognitive change leads directly to behavior change, which may be followed by attitude change.

Many advertisers feel this is by far the most common type of consumer situation. Unfortunately, researchers have found it difficult to develop an inexpensive method for assessing which of these hierarchies hold in the field. Logically, the only valid means for assessing processual change is through a before-and-after or times series experiment.

Recently, however, an innovative method, known as path analysis, has been applied to the area of advertising effectiveness in an attempt to address this information processing problem (see Johansson and Redinger, 1979).

The present study is an attempt to further demonstrate the usefulness--and inexpense--of this approach.

## RESEARCH MODEL

### Low-Involvement Learning Model


Fig. 1

Figure 1 illustrates the components of the low-involvement learning model employed in the present study. As is shown, we are theorizing that there are a number of antecedent conditions (i.e., background characteristics of the

subject) that lead to exposure to advertising for the product. However, for reasons of parsimony, these antecedents will not be included in the data presented in this paper. While in actual field testing of advertising these variables are useful in segmenting the market, they do not aid in the conceptual analysis at hand.

Exposure leads to product awareness and knowledge. Then, because of the low-involvement nature of the product situation (in our case, the ordering of pizzas by students), behavior change follows knowledge change. And, finally, attitude change follows behavior change. In addition, however, we are theorizing that the attitudinal component of our model feeds back in a non-recursive fashion on the cognitive component of the model, thus acting as an additional antecedent condition.

High-Involvement Learning Model

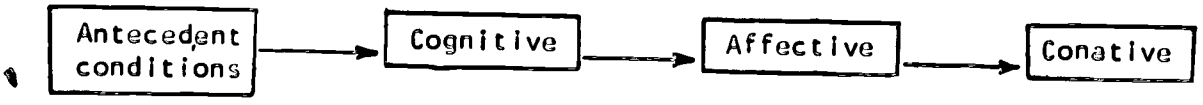



Fig. 2

Figure 2 illustrates the alternative traditional information processing model in which cognitive change leads to affective change which ultimately leads to conative change. It should also be noted that we are theorizing that there is a set of antecedent conditions which precede any initial cognitive change although these conditions will also be deleted in the data analysis.

In sum, the purpose of the present study is to use path analysis to compare the adequacy or ability of these two models to predict advertising effectiveness for the case of pizza delivery among a student population.

## METHODOLOGY

### Study Design

Data for the study were gathered using a cross-sectional survey of undergraduate dormitory residents at the central campus of The Pennsylvania State University (PSU), University Park, Pa. Of the approximately 12,000 dorm residents of PSU's main campus, our sampling plan included 250 students selected randomly using a computerized housing directory. Student-administered personal interviews were conducted with the subjects during the fall of 1982.

The pizza establishment examined in the present study was a local franchise of a national pizza organization. The franchise, which began operating in the State College area in the fall of 1981, used primarily the student newspaper and local rock radio stations to reach its student market.

### Measurement

As is outlined in the preceding discussion, our purpose is to determine which of two models more accurately describes the advertising process as it relates to a "low-involvement" situation, such as pizza delivery for college students. The variables included in these models consist of: 1) advertising exposure, 2) brand awareness, 3) brand knowledge, 4) attitude toward the brand, and 5) brand purchase behavior.

Advertising exposure is defined in terms of a student having heard or seen an advertisement for the pizza delivery establishment, and the media through which the ad was seen or heard.

Brand awareness is defined in terms of unaided recall of the name of the pizza establishment, and whether it has a delivery service.

Brand knowledge is defined as unaided recall of the slogan or logo used in the advertisement.

Attitude toward the brand is defined in terms of subject ratings of the pizza place in terms of several attributes (such as, promptness of delivery, taste of pizza, price of pizza) which were combined to obtain an overall evaluation.

Finally, purchase behavior is defined in terms of whether a student has ever had a pizza delivered by the organization under study, and the frequency of delivery during the past month.

## Analysis Plan

To examine our data, we will employ a path analysis technique, which is designed to reveal the causal linkages and the strength of these linkages among a set of interrelated variables. (See Asher, 1976, for a full discussion of the technique.) Johansson and Redinger (1979) and Harrell, Hutt & Anderson (1980) have demonstrated the usefulness of this approach in the evaluation of advertising effectiveness. However, in neither of these studies was path analysis used to compare a low-involvement model and a high-involvement model.

## Sample Characteristics

Of the original sample size of 250, 193 interviews were completed, representing a completion rate of 77%. Unfortunately, nearly all the non-completions were males. As a result, the sample includes an overrepresentation of females (65.3%) and an underrepresentation of males (34.7%). This misrepresentation will be controlled for in the path analysis.

Subjects were evenly distributed with regard to most other demographic characteristics given a student population. About a third were 17-18 years old (33%), a third were 19 (33%) and a third were 20-22 years old (34%). These ages roughly correspond to the categories of freshmen, sophomores, and upper classmen, although a slightly greater portion of our sample actually were in their first year of school at PSU (44%). About a quarter (28%) were in their second year, and another quarter were in at least their third year. This closely corresponds to the general distribution in the undergraduate student population.

About half (46%) lived in the "south" university dorms, a third in the "east" (39%) and a few (15%) in the "north/west" areas. Again, this corresponds to the general dorm population.

With regard to discretionary income, a quarter (25%) had $35 a month, a quarter (25%) had $35-$65 a month, a quarter (25%) had $65-$100 a month, and a quarter had over $100 a month.

Finally, one half (58%) said they had access to the bus, a third (33%) to a car, a few (15%) to a motorcycle, and a handful said they did not have access to motorized transportation.

## Descriptive Findings

As one would expect for a college student population, most (80%) said they eat pizza at least once a month. Similarly, almost the same proportion (77%) said they order pizza to be delivered at least once a month.

With regard to exposure to advertising for the pizza establishment under study here, we found that a similar high proportion (77%) could recall having seen or heard an ad for this place. As we expected, an overwhelming majority of these had heard or seen their ads either on the radio (74%) or in the newspaper (72%).

Top of mind awareness of this establishment was at an even higher level (86%), however. This reflects the "continuity of impression" made by previous advertising.

Furthermore, brand knowledge was also quite high, as most (70%) correctly recalled the slogan or logo of the establishment.

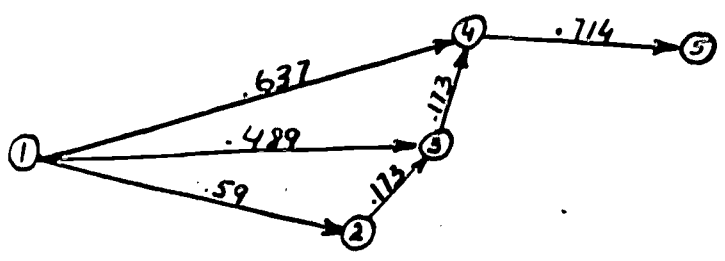
Overall attitudes toward the brand were somewhat favorable, with a mean of 3.477 (on a scale of 1 to 5; five being most favorable).

With regard to the specific attributes of the pizza establishment, attitudes were most favorable toward the organization's use of promotional devices (mean of 4.204) and promptness of delivery (mean of 4.034). Most of the remaining attributes such as taste of the pizza and friendliness of the employees were rated slightly above average. The least favorable attribute was the price of the pizza (i.e., the pizza was seen as fairly expensive).

Finally, with regard to brand purchase behavior, we found that almost three quarters (72%) of the sample at one time had a pizza delivered from the pizza establishment under study. Over half (61%) had the brand delivered at least once during the past month.

## ANALYSIS

### High-Involvement Path Model




1--exposure
2--awareness
3--knowledge
4--attitude
5--behavior

Fig. 3

Figure 3 presents the results of our initial path analysis regarding the high-involvement model. Standardized beta weights have been used in this diagram in order that comparisons can be made as to the relative explanatory power of each variable in the model (Asher, 1976).

As can be seen, the direct linkages between exposure and awareness, knowledge and attitude are relatively strong. In contrast, the indirect linkages between exposure and knowledge are considerably weaker. The strength of these linkages can be obtained by multiplying the beta weights for each connecting path in the model. For example, the indirect effect of exposure on knowledge equals the product of the 1-2 linkage (.59) and the 2-3 linkage (.173), which is .102. Using the same technique the total effect of advertising on purchase behavior can also be calculated. These calculations are as follows:

$$1\text{-}2\text{-}3\text{-}4\text{-}5 = .59 \times .173 \times .173 \times .714 = .0126$$

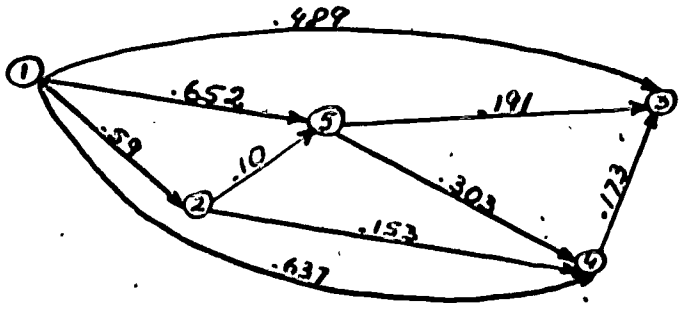
$$1\text{-}3\text{-}4\text{-}5 = .489 \times .173 \times .714 = .06040$$

$$1\text{-}4\text{-}5 = .637 \times .714 = .455$$

$$\Sigma = .52$$

Thus, the total effect of advertising on purchase behavior using a high-involvement model is .52.

Low-Involvement Path Model




1--exposure
2--awareness
3--knowledge
4--attitude
5--behavior

Fig. 4

Figure 4 presents the results of the path analysis for the low-involvement model. As is the case for the high-involvement model, the direct linkages between exposure and awareness, etc., are quite strong. Indirect effects are much weaker, too. However, in contrast to the high-involvement model, this procedure indicates that the total effect of advertising on purchase behavior is much greater for the low-involvement model. Using the following calculations:

$$1\text{-}2\text{-}5 = .59 \times .10 = .059$$
$$1\text{-}5 = .652 = .652$$
$$\Sigma = .711$$

We see that the total effect of advertising on purchase behavior is .711 for the low-involvement model. While there is no statistical test available to us to determine whether this value is greater than the .52 obtained for the high-involvement model, we do feel confident in concluding that the low-involvement model does a more adequate job of explaining the linkages between exposure and purchase behavior.

It should be noted that the low-involvement model also does a better job of predicting each of the other variables included in the model than the high-involvement model.

## SUMMARY AND DISCUSSION

Overall, then, the path analytic approach used in this study suggests that for a product such as pizza, a low-involvement model does a better job of predicting advertising effectiveness than a high-involvement model.

By extrapolation, it can be argued that a path analytic approach would produce better results using a traditional learning model under conditions of high involvement and high product differentiation.

However, what remains unanswered here is how one can determine theoretically and empirically when a situation is of high or low involvement. An argument was made in this paper that "pizza" is a low-involvement product. However, no measure was developed to test the validity of this assumption. While some attempts have been made to address this issue, clearly, additional research is needed to develop valid measures of involvement and product differentiation.

With the development and testing of such measures, path analysis will prove to be an even more useful technique for calculating the effectiveness of advertising in the field. Furthermore, additional research is needed to develop a conceptual distinction between not only levels of involvement, but types of involvement (see Rothschild, 1972; Pavlik, 1983).

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